

PX
User Guide

Lenovo
ThinkStation



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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Discover your Lenovo computer

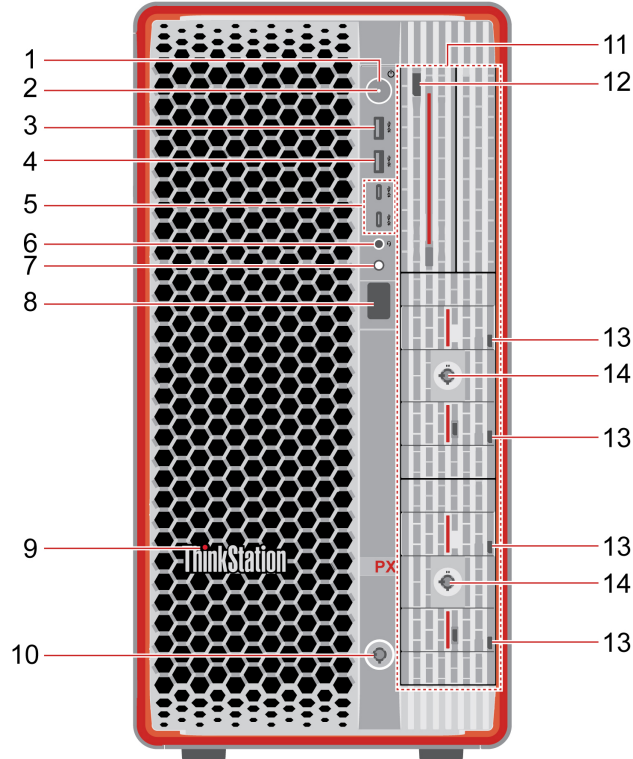
Thank you for choosing a Lenovo computer! We are dedicated to delivering the best solution to you.

Before starting your tour, please read the following information:

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

Chapter 1. Meet your computer

Front



Item	Description	Item	Description
1.	Power button	2.	Power indicator
3.	USB-A 3.2 Gen 2 connector*	4.	Always On USB-A 3.2 Gen 2 connector*
5.	USB-C® (3.2 Gen 2) connectors*	6.	Headset connector
7.	Diagnostic LCD switch	8.	Diagnostic LCD
9.	ThinkStation®LED	10.	Front access bay lock
11.	Front access bays (1 to 6)	12.	Hard disk drive LED label*
13.	M.2 or E1.S solid-state drive LED labels*	14.	Dual M.2 or E1.S SSD enclosure locks*

* 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 (USB-C)	40
Thunderbolt 4 (USB-C)	40

Power indicator

Show the system status of your computer.

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

Always On USB-A 3.2 Gen 2 connector

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

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

1. Enter the UEFI BIOS menu. See “Enter the BIOS menu” on page 18.
2. Click **Devices** → **USB Setup** → **Front USB Ports** → **USB Port 2** to enable the Always On USB feature.

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. <ul style="list-style-type: none"> • Short press (when multiple events occur): Switch among error events and display the corresponding QR code of the selected event. • Long press (about 3 seconds): Clear the selected event.

Diagnostic LCD

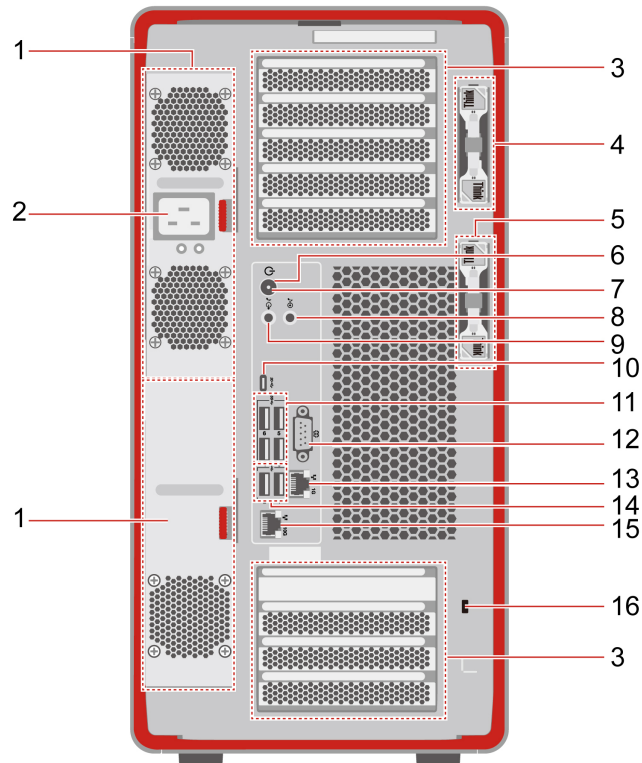
Display the diagnostic information when an issue or error is detected. You can decode the error code at <https://www.thinkworkstationsoftware.com/codes>.

Hard disk drive or M.2 or E1.S solid-state drive LED label

The storage drives have the following two types of LEDs:

LED	Status and indication
 Status LED	<ul style="list-style-type: none">• Solid on: The storage drive status is failure.• 4 Hz blinking (four times per second): Locating the storage drive.• 1 Hz blinking (once a second): Rebuilding RAID.• Off (when the computer is powered on): The storage drive status is normal.
 Activity LED	<ul style="list-style-type: none">• Solid on: The storage drive is online, installed, or powered on (no activity).• Variable blinking: Accessing the storage drive.• Off (when the computer is powered on): The storage drive is not installed or powered.

Rear



Item	Description	Item	Description
1.	Power supply unit bays (2)	2.	Power cord connector
3.	PCI-Express card areas	4.	Key-nest for the left side cover and front access bays
5.	Key-nest for the dual M.2 or E1.S SSD enclosure	6.	Power button
7.	Power indicator	8.	Audio line-in connector
9.	Audio line-out connector	10.	USB-C (3.2 Gen 2x2) connector
11.	USB-A 3.2 Gen 1 connectors	12.	Serial connector*
13.	Ethernet connector (1 G)	14.	USB-A 2.0 connectors
15.	Ethernet connector (10 G)	16.	Security-lock slot

* for selected models

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.

Serial connector

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

PCI-Express card areas

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

Specifications

Specifications	Description
Dimensions	<ul style="list-style-type: none">• Width: 220 mm (8.7 inches)• Height: 434 mm (17.1 inches)• Depth: 575 mm (22.6 inches)
Weight (without packaging)	Maximum configuration as shipped: 35.6 kg (78.5 lb)
Hardware configuration	<ol style="list-style-type: none">1. Open the system menu from the top-right corner and click Settings.2. Click About.
Power supply	<ul style="list-style-type: none">• 1850-watt 92% hot-swappable power supply• 1400-watt 92% hot-swappable power supply <p>Note: Pay attention to the power supply of this product and ensure that you use it under the conditions that meet the circuit requirements.</p>
Electrical input	<ul style="list-style-type: none">• 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 sixteen double data rate 5 (DDR5) error correction code (ECC) registered dual inline memory modules (RDIMMs) Maximum memory capacity: Up to 4 TB (16 x 256 GB if available)
Storage device	<ul style="list-style-type: none">• 3.5-inch hard disk drive*• M.2 solid-state drive*• E1.S solid-state drive* <p>Type Disks in the search box and use the Disks application to view the storage drive capacity of your computer.</p> <p>Note: The storage drive capacity indicated by the system is less than the nominal capacity.</p>
Video features	<ul style="list-style-type: none">• PCIe x16 card slots on the system board for a discrete graphics card• Video connectors on a discrete graphics card:<ul style="list-style-type: none">– DisplayPort connector– Mini DisplayPort connector
Expansion	<ul style="list-style-type: none">• Front access bay• Memory slots• M.2 solid-state drive slots• PCI Express slots• Power supply unit bay
Network features	<ul style="list-style-type: none">• 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® microprocessor families compatible with this ThinkStation computer feature an integrated memory controller. The memory controller provides the microprocessor with direct access to the system memory. Therefore, the system memory speed will be determined by the memory module type, frequency, size (capacity), the number of memory modules installed, and the microprocessor model.

Notes:

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

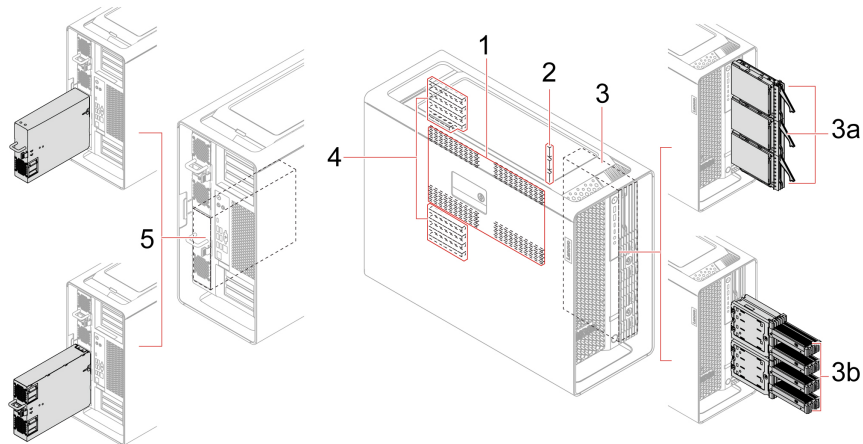
Refer to the following information about the system memory speed:

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

Expand your computer

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

Note: To add or replace a device, see Chapter 4 “CRU replacement” on page 25.

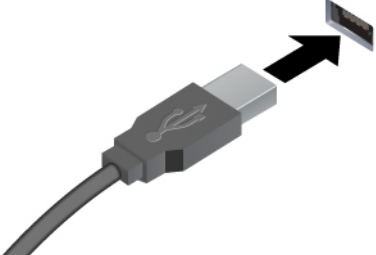



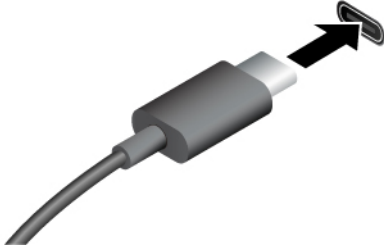




Item	Description
1. Memory slots	Up to sixteen memory modules are installed in selected models.
2. On-board M.2 solid-state drive slots	Up to three M.2 solid-state drives are installed in selected models.
3. Front access bays (1 to 6)	<p>You can install the following storage drives in front access bays:</p> <ul style="list-style-type: none"> • Up to three 3.5-inch hard disk drives* • Up to four M.2 solid-state drive* or E1.S solid-state drives* <p>Note: The dual M.2 or E1.S SSD enclosure priority is higher than the 3.5-inch hard disk drive.</p>
3a. Front access bay 1 to 3	You can install up to three 3.5-inch hard disk drives* in selected models.
3b. Front access bay 2+5 and 3+6	You can install up to two dual M.2 or E1.S SSD enclosures* in selected models. Each dual M.2 or E1.S SSD enclosure supports up to two M.2 solid-state drives* or two E1.S solid-state drives*.
4. PCIe slots	You can install compatible PCIe cards (up to nine) in the PCIe card slots.
5. Power supply unit bay 2	<p>You can install a power supply assembly or a PSU bay storage enclosure with a 3.5-inch hard disk drive in this bay.</p> <p>Note: The PSU bay storage enclosure priority is higher than the power supply assembly.</p>

* for selected models

USB specifications

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

Connector name	Description
 <ul style="list-style-type: none"> <li data-bbox="201 556 516 583">•  USB-A 2.0 connector <li data-bbox="201 598 586 625">•  USB-A 3.2 Gen 1 connector <li data-bbox="201 640 586 667">•  USB-A 3.2 Gen 2 connector 	<p data-bbox="836 409 1446 489">Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.</p>
 <ul style="list-style-type: none"> <li data-bbox="201 1008 602 1035">•  USB-C (3.2 Gen 2) connector <li data-bbox="201 1050 618 1077">•  USB-C (3.2 Gen 2x2) connector 	<ul style="list-style-type: none"> <li data-bbox="836 819 1404 871">• Charge USB-C compatible devices with the output voltage and current of 5 V and 3 A. <li data-bbox="836 892 1446 966">• Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to <a data-bbox="1063 945 1446 966" href="https://www.lenovo.com/accessories">https://www.lenovo.com/accessories.

Chapter 2. Get started with your computer

Connect an external display

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

Change display settings

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

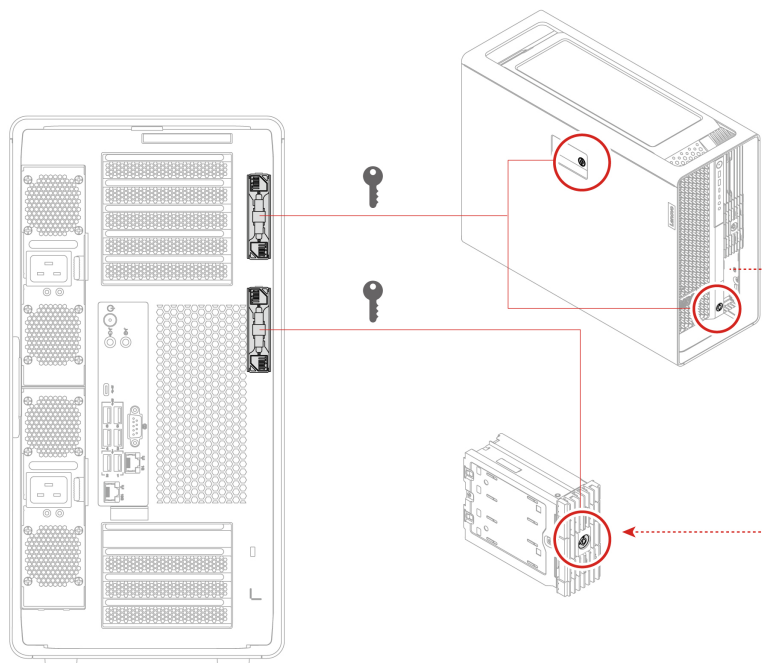
Lock the computer

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

Key lock

Locking the side cover, front access bay, or dual M.2 or E1.S SSD enclosure through a key lock prevents unauthorized access to the inside of your computer or storage drives. The keys for the key lock are attached to the rear of the machine. For security, store the keys in a secure place when you are not using them.

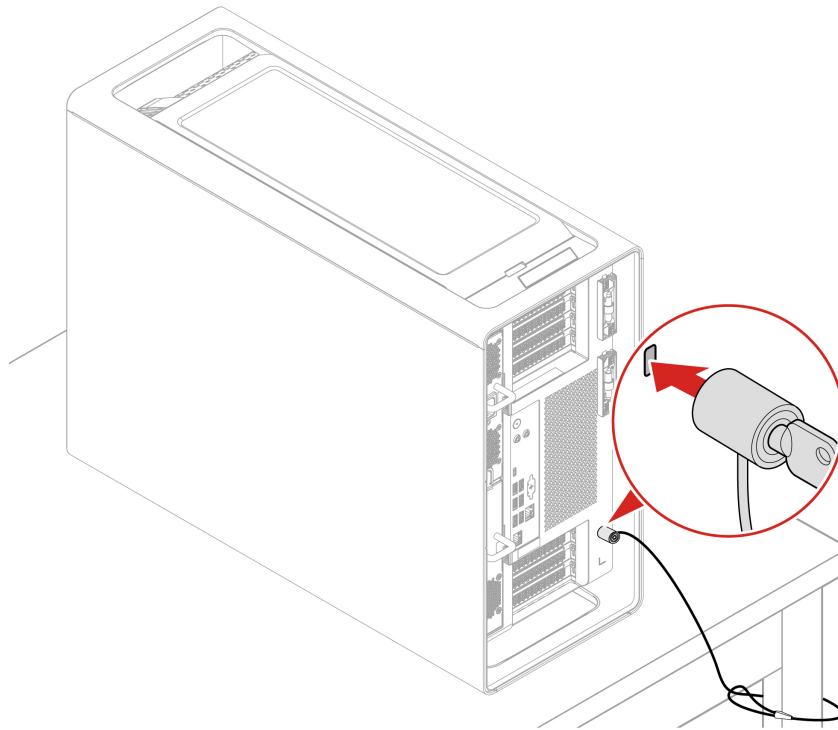
Note: The key can be common or random, that is, use one key for multiple locks or one key for one lock. For details, see the table below:



Lock location	Key description
Left side cover	<p>The key for the left side cover might be one of the following:</p> <ul style="list-style-type: none"> • Common key carved with 00: The same key can open locks for side cover and front access bays on the same computer or on different computers. • Random key carved with R and xx, for example, 01, 02, and 03: The same key can open locks for side cover and front access bays on the same computer, but cannot open locks for side cover and front access bays on other PX computers.
Front bezel (for front access bays)	<p>The key for the front access bays might be one of the following:</p> <ul style="list-style-type: none"> • Common key carved with 00: The same key can open locks for side cover and front access bays on the same computer or on different computers. • Random key carved with R and xx, for example, 01, 02, and 03: The same key can open locks for side cover and front access bays on the same computer, but cannot open locks for side cover and front access bays on other PX computers.
Dual M.2 or E1.S SSD enclosure	<p>Common key carved with 00: The same key can open locks for multiple dual M.2 or E1.S SSD enclosures on the same PX computer or on other PX computers.</p>

Security lock

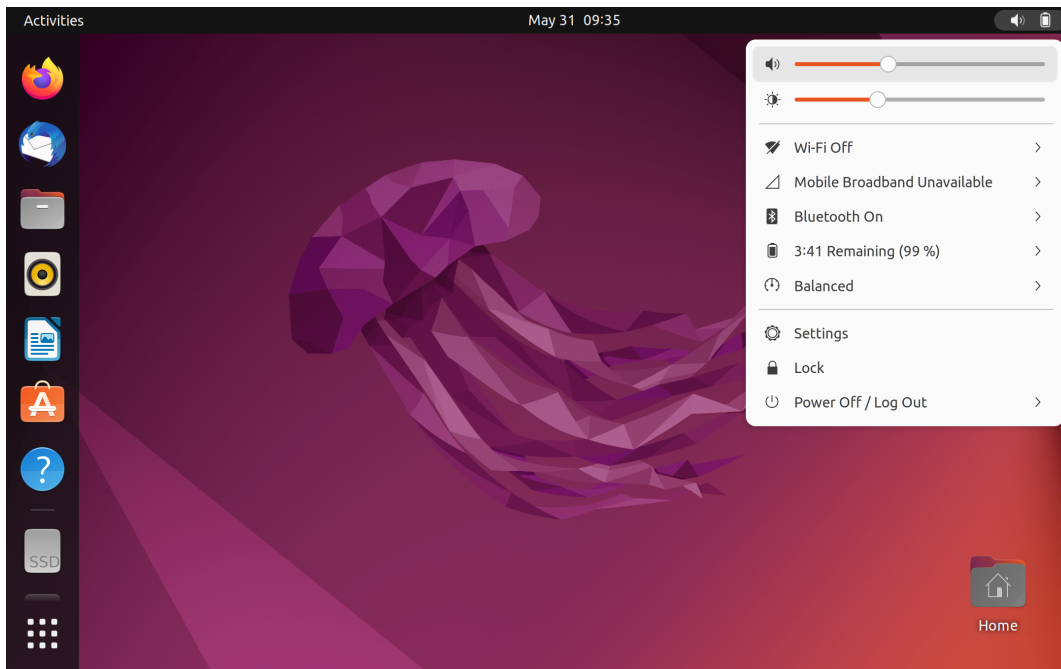
Lock your computer to a desk, table, or other fixtures through a security lock.



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**.

Access networks

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

Connect to the wired Ethernet

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

Connect to Wi-Fi networks (for selected models)

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

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

Transfer data

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

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

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



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

Chapter 3. Advanced configurations

Set the power plan

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

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

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

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

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

UEFI BIOS passwords

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

Password types

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

- Power-on password

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

- Supervisor password

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

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

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

- Hard disk password

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

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

- System management password (for selected models)

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

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

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

Set, change, and remove a password

Before you start, print these instructions.

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

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

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

Certificate-based BIOS management

Certificate-based BIOS authentication (also called the password-less management mode) provides more secure UEFI BIOS management with password-free solution. It is used to replace the supervisor password / system management password for authentication if you have set one.

Note: Supervisor password / system management password are disabled automatically when certificate mode is enabled. But the power-on password / hard disk password still can be used normally in certificate mode if you have set one.

For certificate enrollment, see *Certificate Enrollment Guide* at: https://support.lenovo.com/docs/certificate_enrollment_guide

Enter the BIOS menu with certificate

Once you have enrolled the certificate, you can enter the BIOS menu with the certificate.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the BIOS menu.
2. The QR code is displayed. Scan the QR code to save the request data and send the request data to IT admin by e-mail or phone.

Note: If you choose to authenticate without the QR code, save the request data in a USB key and send the request data to IT admin by e-mail or phone.

3. Enter the unlock code provided by IT admin and click **OK**.

Notes:

- The unlock encode is a one-time password and is valid only during logon prompt (in one power-on cycle) for up to two hours.

- If you click **Skip**, you can enter the BIOS setup menu without BIOS management authority. But certificate reset is allowed.

Reset certificate

The enrolled certificate cannot be disabled. You can reset or remove it:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Enter the BIOS menu with the certificate or skip the certification authentication process.
3. Select **Security** → **Certificate-based BIOS Authentication** → **Reset Certificate**.
4. Follow the on-screen instructions to enter the reset code provided by IT admin.

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.

What is UEFI BIOS

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

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

Enter the BIOS menu

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

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

Navigate in the BIOS interface

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

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

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

Change the display language of UEFI BIOS

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

To change the display language of UEFI BIOS:

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

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

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

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

To change the display mode of UEFI BIOS:

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

Set the system date and time

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

Change the priority boot order

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

Change the priority boot order permanently

1. Depending on the type of the storage device, do one of the following:
 - If the storage device is internal, go to step 2.

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

Select a temporary boot device

Note: Not all discs and storage drives are bootable.

1. Depending on the type of the storage device, do one of the following:
 - If the storage device is internal, go to step 2.
 - If the storage device is a disc, ensure that the computer is on or turn on the computer. Then, insert the disc into the optical drive.
 - If the storage device is an external device other than a disc, connect the storage device to the computer.
2. Restart the computer. When the logo screen is displayed, press F12 or Fn+F12.
3. Select the storage device as desired and press Enter.

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

Enable or disable the configuration change detection feature

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

To enable or disable the configuration change detection feature:

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

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

Enable or disable the automatic power-on feature

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

To enable or disable the automatic power-on feature:

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

2. Select **Power → Automatic Power On** and press Enter.
3. Select the feature as desired and press Enter.
4. Enable or disable the feature as desired.
5. Press F10 or Fn+F10 to save the changes and exit.

Enable or disable the ErP LPS compliance mode

Lenovo computers meet the eco-design requirements of the ErP Lot 3 regulation. For more information, go to:

<https://www.lenovo.com/us/en/compliance/eco-declaration>

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

To enable or disable the ErP LPS compliance mode:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Power → Enhanced Power Saving Mode** and press Enter.
3. Depending on whether you select **Enabled** or **Disabled**, do one of the following:
 - If you select **Enabled**, press Enter. Then, select **Power → Automatic Power On** and press Enter. Check whether the Wake on LAN feature is disabled automatically. If no, disable it.
 - If you select **Disabled**, press Enter. Then, go to the next step.
4. Press F10 or Fn+F10 to save the changes and exit.

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

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

Change BIOS settings before installing a new operating system

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

To change the BIOS settings:

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

Update UEFI BIOS

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

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

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

Reset system to factory default

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

1. Restart the computer. When the logo screen is displayed, press F1 to enter the UEFI BIOS menu.
2. Select **Security** → **Reset system to Factory Default** and press Enter.
3. Several warning windows might be displayed. Do the following before resetting the system to the factory default settings:
 - a. Reset the Certificate-based BIOS Authentication. Refer to “Certificate based BIOS management” on page 16.
 - b. Deactivate the Absolute Persistence Module.
 - c. Remove the NVMe password if you have set one.
4. For computer models with RAID settings, a window is displayed to remind you of data damage. Select **Yes** to proceed.
5. A window is displayed to confirm all UEFI BIOS settings will be reset. Select **Yes** to proceed.

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

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

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

View UEFI BIOS Event logs

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

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

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

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

Chapter 4. CRU replacement

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

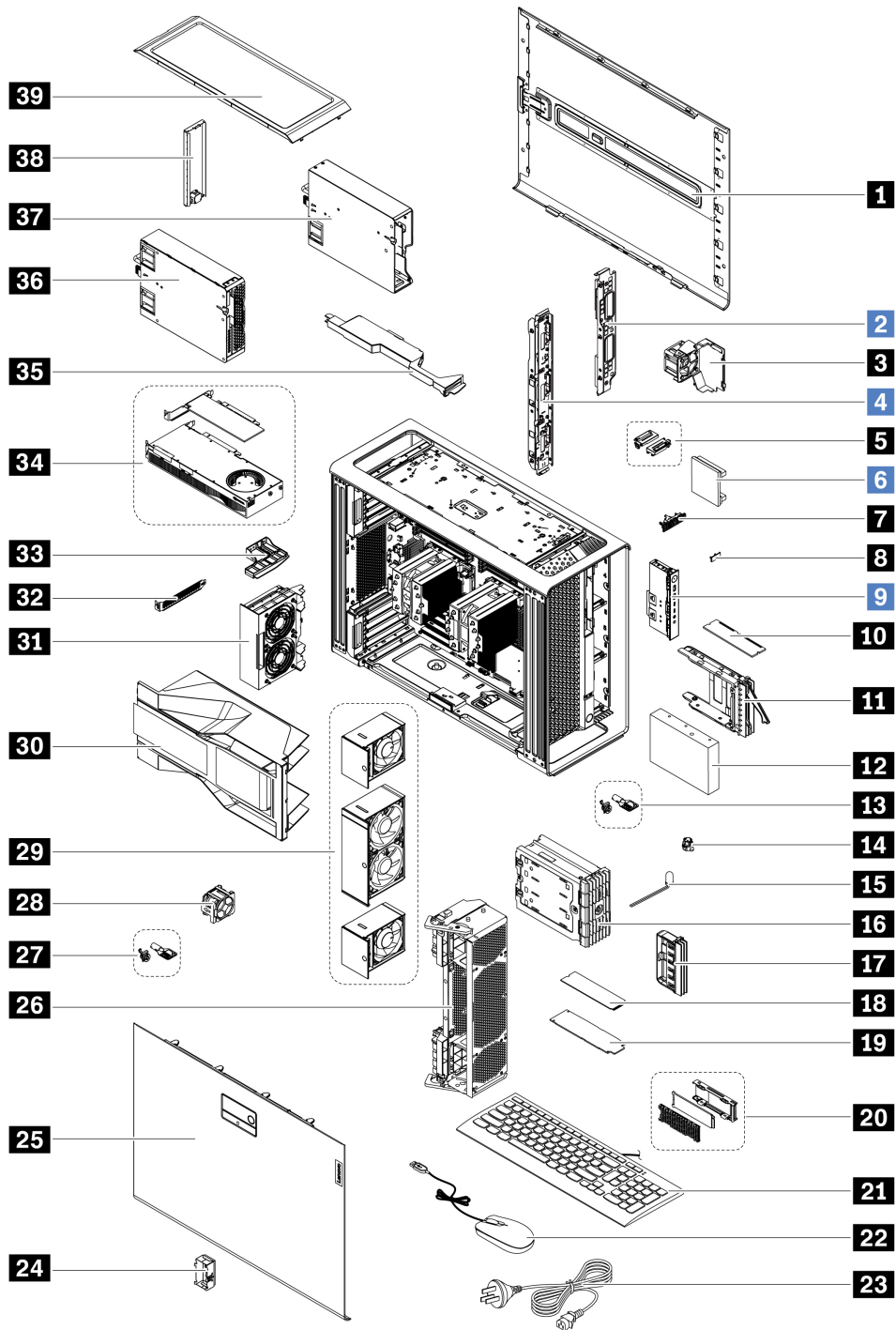
- **Self-service CRUs:** Refer to parts that can be replaced easily by customer themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be replaced by customers with a greater skill level. Trained service technicians can also provide service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



Number	Description	Self-service CRU	Optional-service CRU
1	Right side cover	Yes	No
2	Power distribution board and bracket	No	Yes
3	Storage fan assembly	Yes	No
4	BCB board and bracket	No	Yes
5	Wi-Fi antenna cover	Yes	No

Number	Description	Self-service CRU	Optional-service CRU
6	NVLINK bridge*	No	Yes
7	ThinkStation logo badge	Yes	No
8	ID badge	Yes	No
9	Front panel IO assembly	No	Yes
10	Memory module	Yes	No
11	Hard disk drive bracket*	Yes	No
12	Hard disk drive*	Yes	No
13	Lock kit for the front access bay*	Yes	No
14	Think LED holder	Yes	No
15	Think LED cable	Yes	No
16	Dual M.2 or E1.S SSD enclosure*	Yes	No
17	Blank bezel	Yes	No
18	M.2 solid-state drive*	Yes	No
19	E1.S solid-state drive*	Yes	No
20	On board M.2 solid-state drive heatsink kit*	Yes	No
21	Keyboard	Yes	No
22	Mouse	Yes	No
23	Power cord	Yes	No
24	NVLINK retainer*	Yes	No
25	Left side cover	Yes	No
26	Front fan bracket	Yes	No
27	Lock kit for the left side cover*	Yes	No
28	Memory fan duct	Yes	No
29	Front fan assembly	Yes	No
30	CPU duct	Yes	No
31	Rear fan assembly	Yes	No
32	PCIe bracket	Yes	No
33	PCIe extender*	Yes	No
34	PCIe card	Yes	No
35	Super capacitor module*	Yes	No
36	Power supply assembly	Yes	No
37	PSU bay storage enclosure	Yes	No
38	Dummy cover for the upper PSU bay	Yes	No
39	Top cover	Yes	No

* for selected models

System board

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

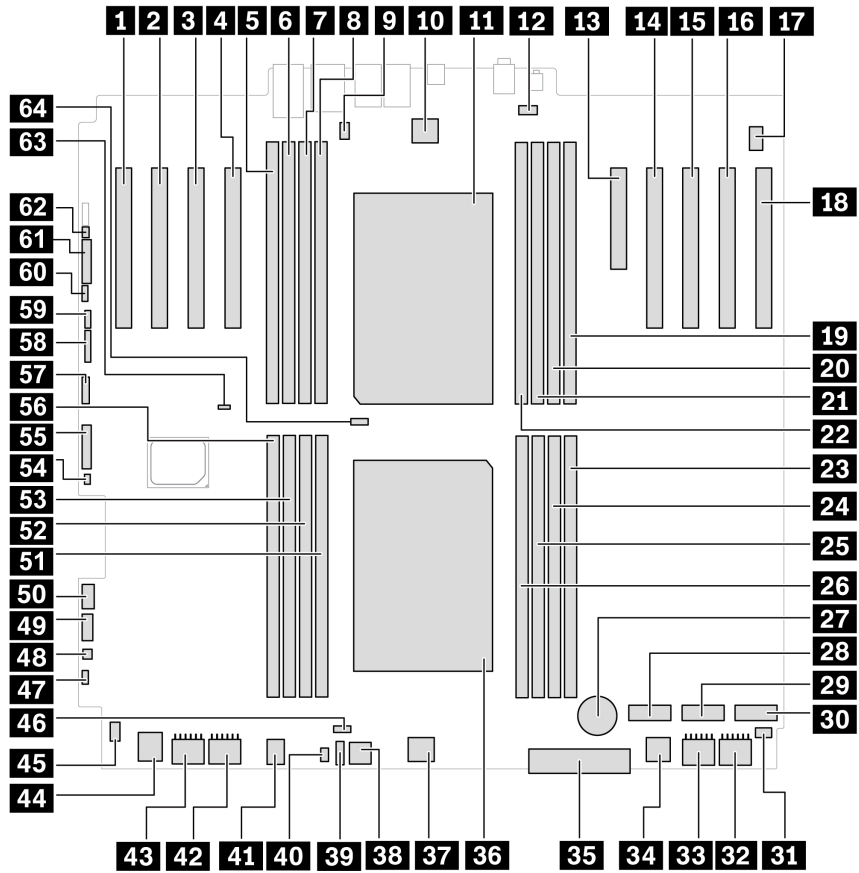


Figure 1. System board (front) part locations

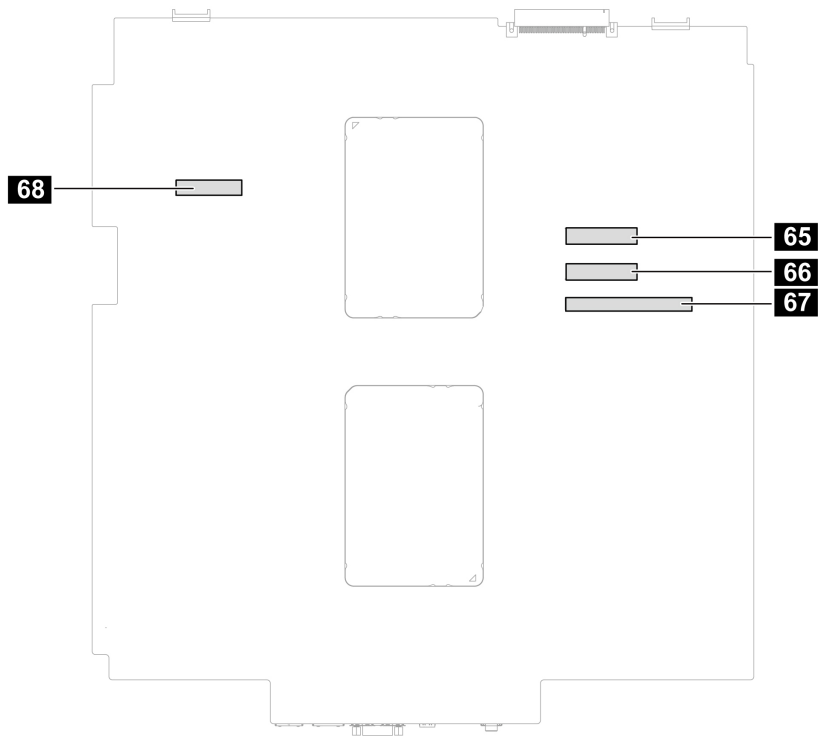


Figure 2. System board (back) part locations

Item	Item
1 PCIe card slot 9 (x 16, Gen4, Microprocessor 1)	21 PCIe card slot 8 (x 16, Gen5, Microprocessor 1)
3 PCIe card slot 7 (x 16, Gen4, Microprocessor 1)	4 PCIe card slot 6 (x 16, Gen5, Microprocessor 1)
5 Memory slot 9	6 Memory slot 10
7 Memory slot 11	8 Memory slot 12
9 Serial port (COM) connector	10 Rear-fan-assembly connector
11 Microprocessor 2*	12 Top memory-fan connector
13 PCIe card slot 5 (x 8, Gen4, Microprocessor 2)	14 PCIe card slot 4 (x 16, Gen5, Microprocessor 2)
15 PCIe card slot 3 (x 16, Gen5, Microprocessor 2)	16 PCIe card slot 2 (x 16, Gen4, Microprocessor 2)
17 Internal-speaker connector	18 PCIe card slot 1 (x 16, Gen4, Microprocessor 2)
19 Memory slot 16	20 Memory slot 15
21 Memory slot 14	22 Memory slot 13
23 Memory slot 1	24 Memory slot 2
25 Memory slot 3	26 Memory slot 4
27 Coin-cell battery	28 M.2 solid-state drive slot 3
29 M.2 solid-state drive slot 2	30 M.2 solid-state drive slot 1
31 Right cover presence switch connector (intrusion switch connector)	32 Graphics card power connector 4

Item	Item
33 Graphics card power connector 3	34 Front fan assembly connector 2
35 Front panel connector	36 Microprocessor 1
37 Front fan assembly connector 1	38 Misc power connector
39 Thermal sensor connector	40 Logo LED connector
41 Bottom memory-fan connector	42 Graphics card power connector 1
43 Graphics card power connector 2	44 Front fan assembly connector 3
45 Left cover presence switch connector (intrusion switch connector)	46 Microprocessor 1 fan connector
47 Power button header	48 Thunderbolt™ power connector
49 Thunderbolt control connector	50 USB 3.2 Gen1
51 Memory slot 5	52 Memory slot 6
53 Memory slot 7	54 Drive_ACT
55 Alternative Trusted Platform Module (TPM) header	56 Memory slot 8
57 USB 2.0	58 BMC
59 VROC	60 CLR_RTC
61 APS	62 Reset header
63 Clear CMOS / Recovery jumper	64 Microprocessor 2 fan connector
65 MCIO connector 2	66 MCIO connector 1
67 Power distribution board connector	68 Drive_backplane

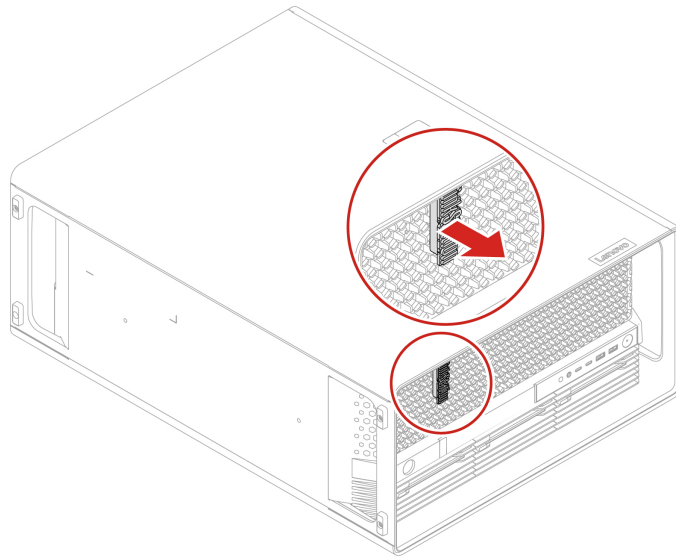
ThinkStation logo badge

Prerequisite

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

Removal steps

Remove the ThinkStation logo badge.



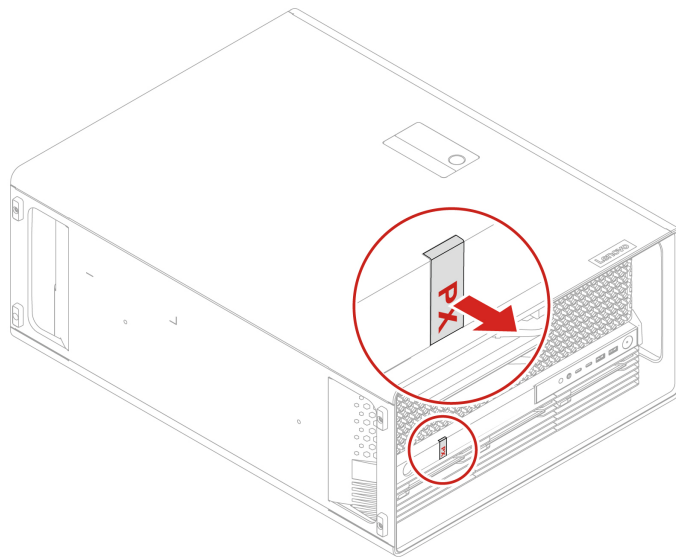
ID badge

Prerequisite

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

Removal steps

Remove the ID badge.



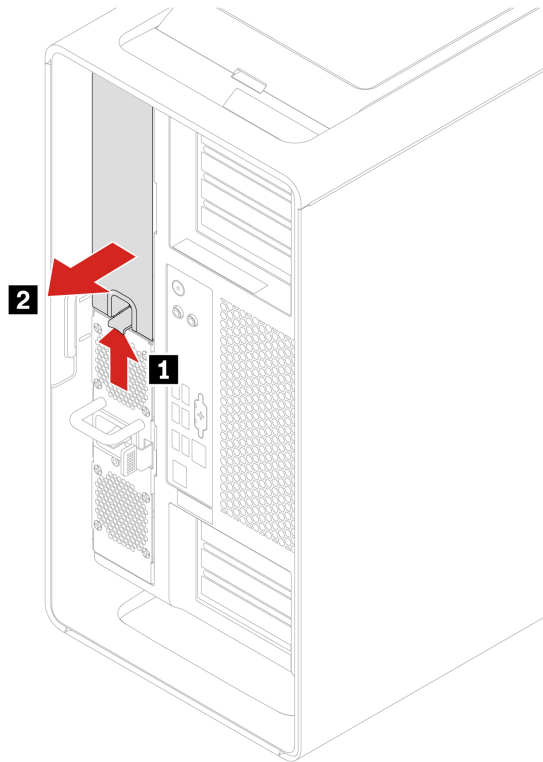
Dummy cover for the upper PSU bay

Prerequisite

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

Removal steps

Remove the dummy cover for the upper PSU bay.



Power supply assembly

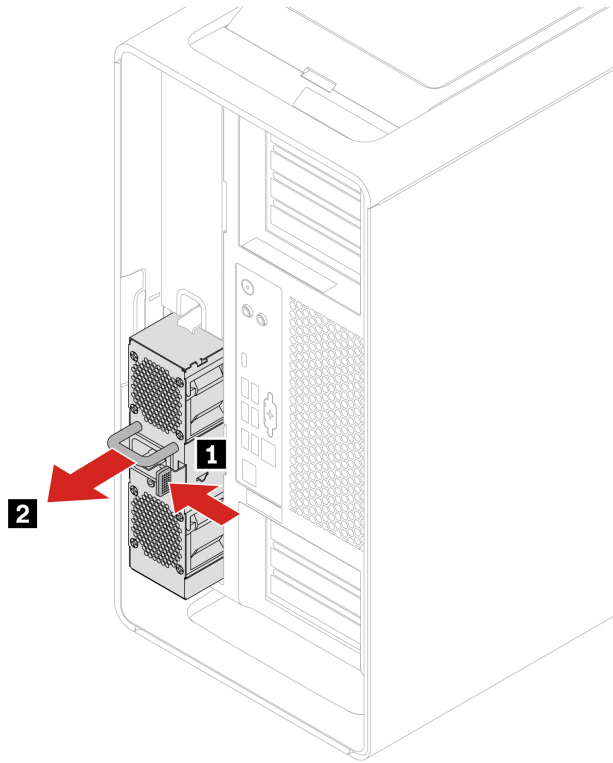
Prerequisite

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

The power supply assembly is hot-swappable.

Removal steps

Remove the power supply assembly.



Top cover

Prerequisite

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



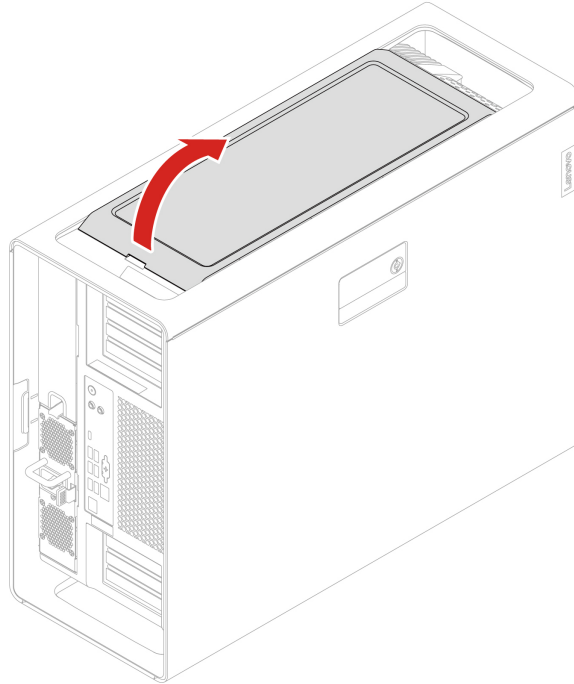
Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

For access, do the following:

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

Removal steps

Remove the top cover.



Wi-Fi antenna cover

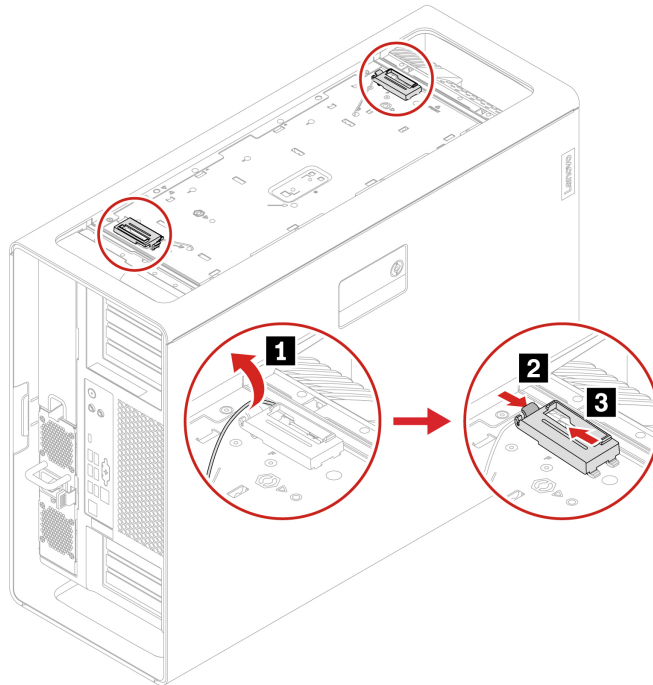
Prerequisite

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

For access, remove the top cover. See “Top cover” on page 33.

Removal steps

Remove the Wi-Fi antenna cover.



Left side cover

Prerequisite

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



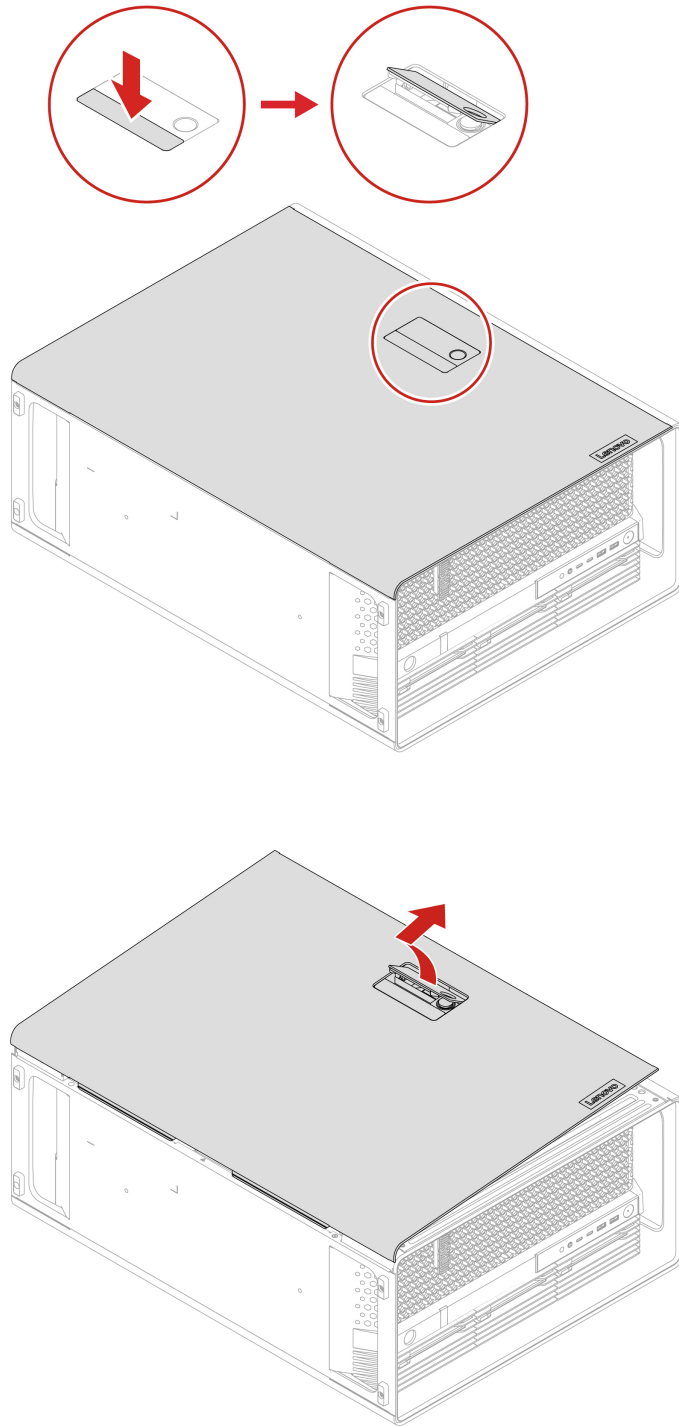
Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

For access, do the following:

1. 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. Lay the computer on its side for easier access to the left side cover.

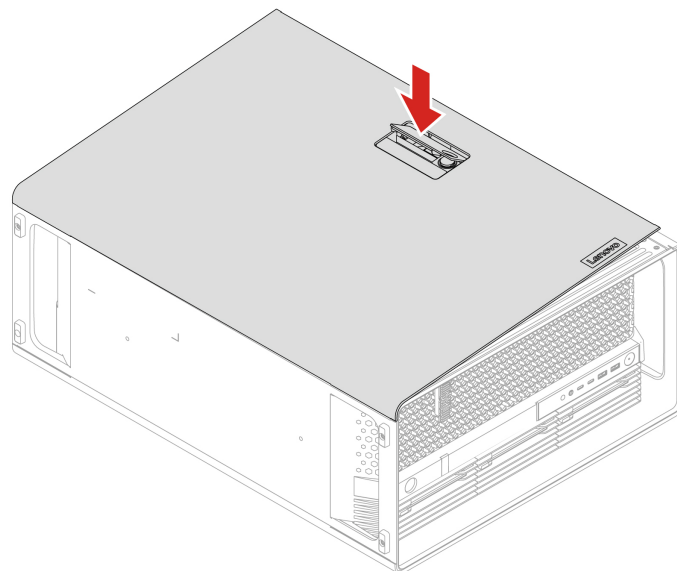
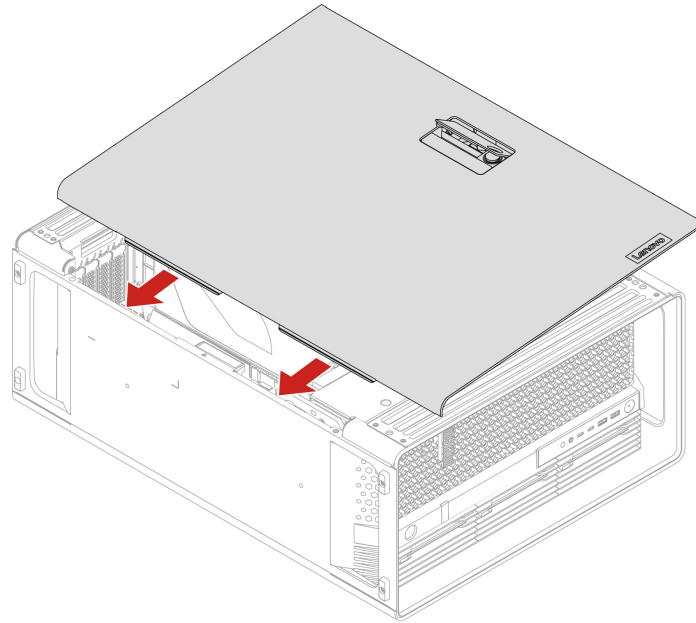
Removal steps

Remove the left side cover.



Installation steps

Install the left side cover.



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

NVLINK retainer

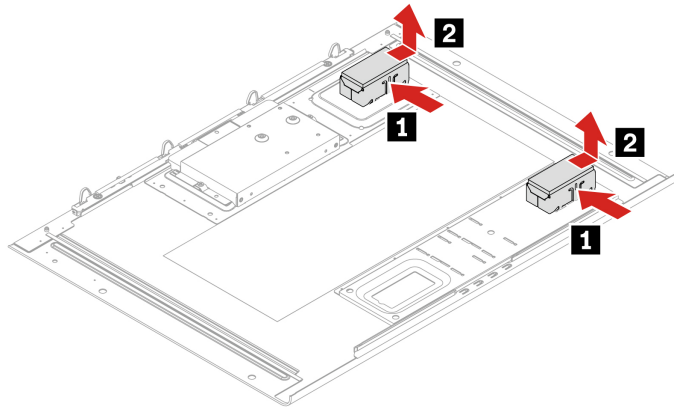
Prerequisite

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

For access, remove the left side cover. See “Left side cover” on page 35.

Removal steps

Remove the NVLINK retainer.



CPU duct

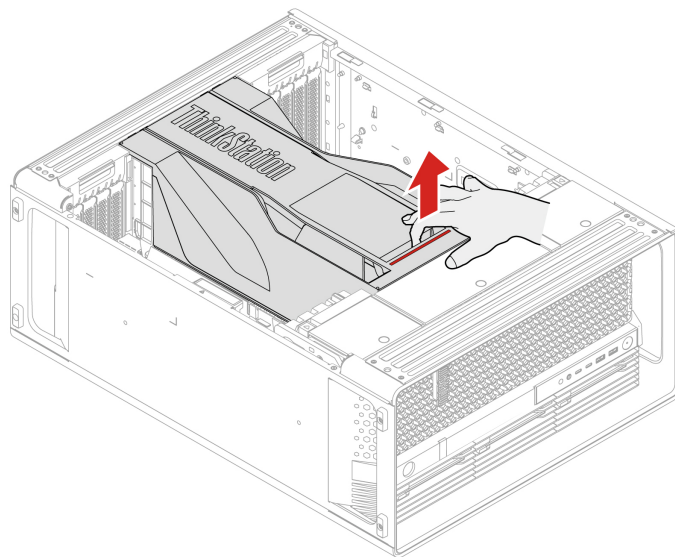
Prerequisite

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

For access, remove the left side cover. See “Left side cover” on page 35.

Removal steps

Remove the CPU duct.



Front fan assembly

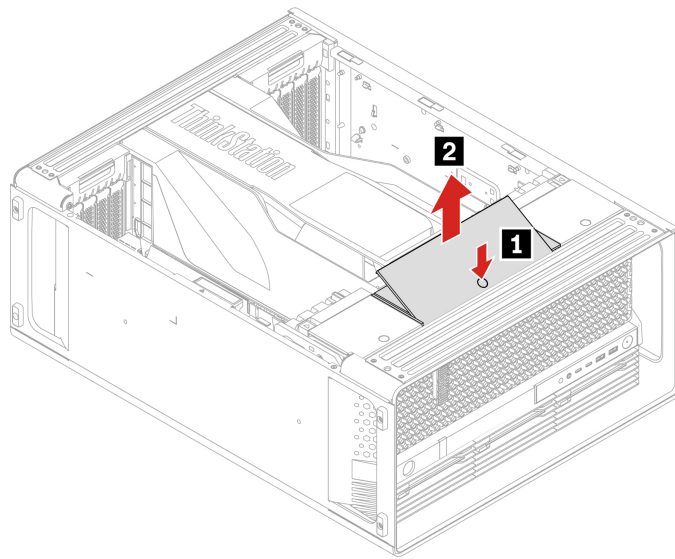
Prerequisite

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

For access, remove the left side cover. See “Left side cover” on page 35.

Removal steps

Remove the front fan assembly.



NVLINK bridge

Prerequisite

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

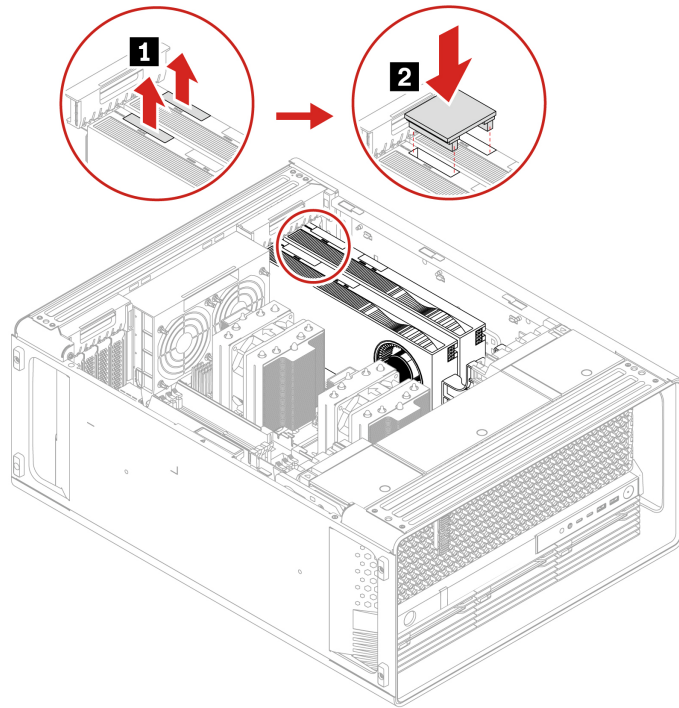
Note: The NVLINK bridge is shipped in an accessory box within the computer carton box. You need to take it out from the packaging and install it by yourself.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.

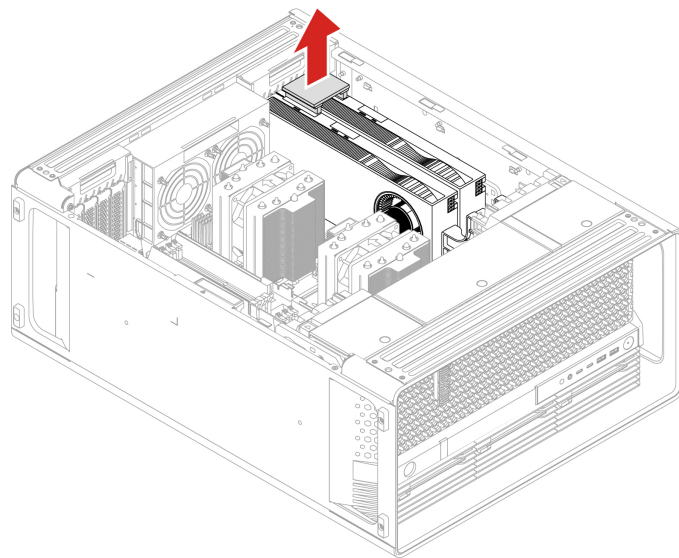
Installation steps

Install the NVLINK bridge.



Removal steps

Remove the NVLINK bridge.



Front fan bracket

Prerequisite

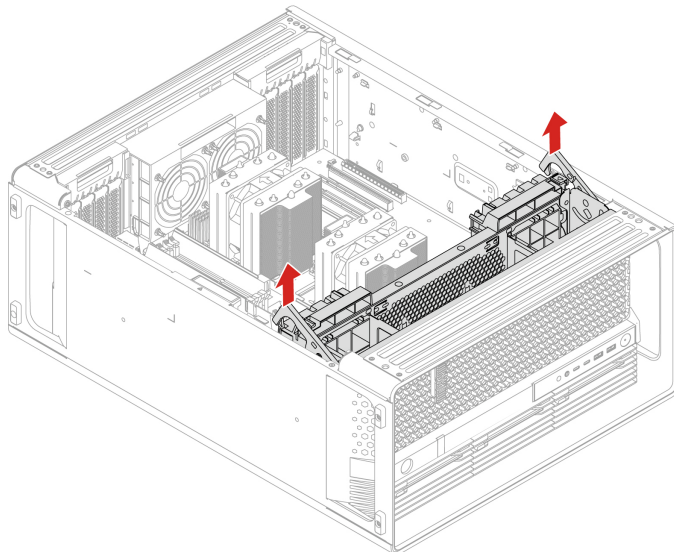
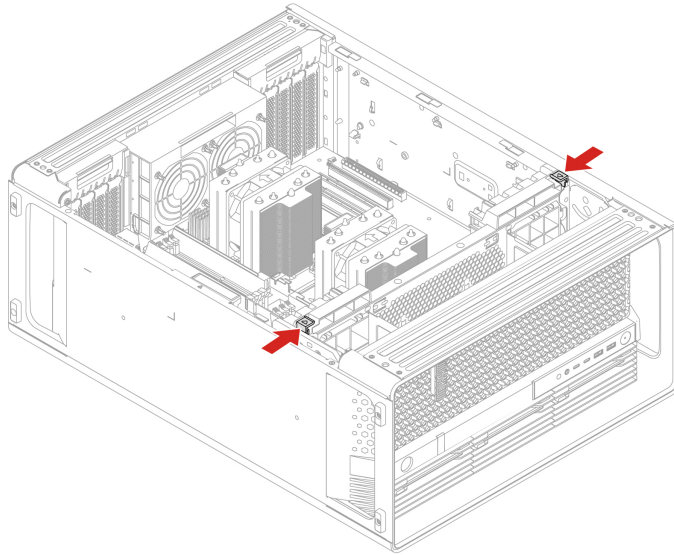
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.

Removal steps

Remove the front fan bracket.



Rear fan assembly

Prerequisite

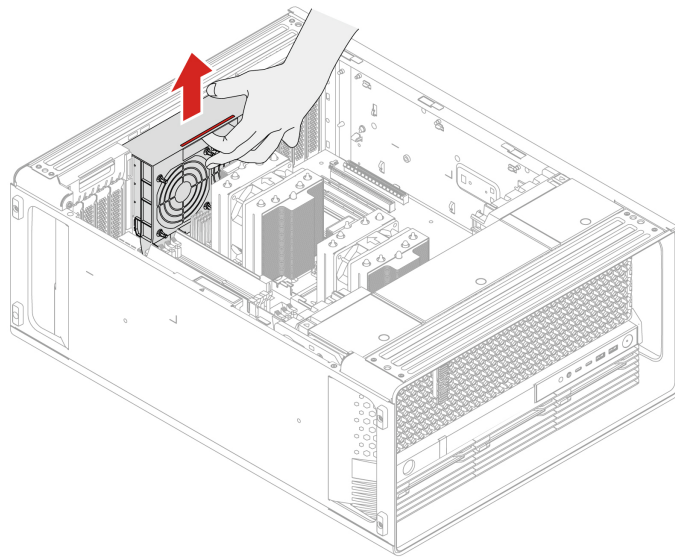
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.

Removal steps

Remove the rear fan assembly.



Blank bezel

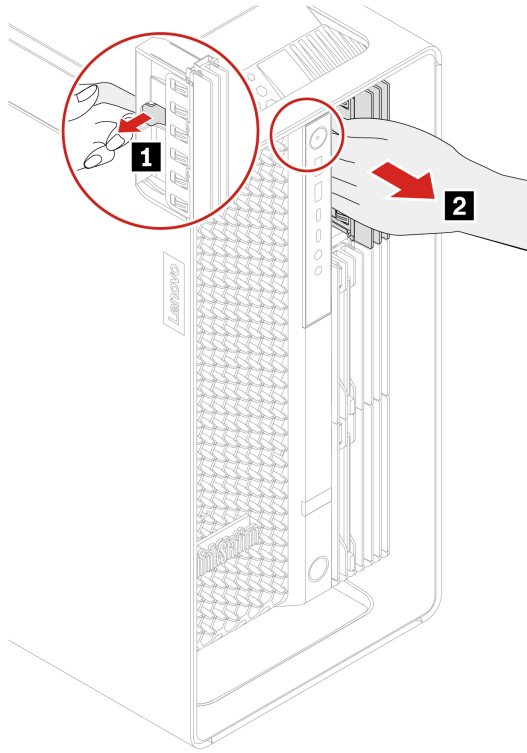
Prerequisite

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

For access, remove the hard disk drive bracket beside the blank bezel. See “Hard disk drive in the front access bay” on page 50.

Removal steps

Remove the blank bezel.



Front panel IO assembly

Prerequisite

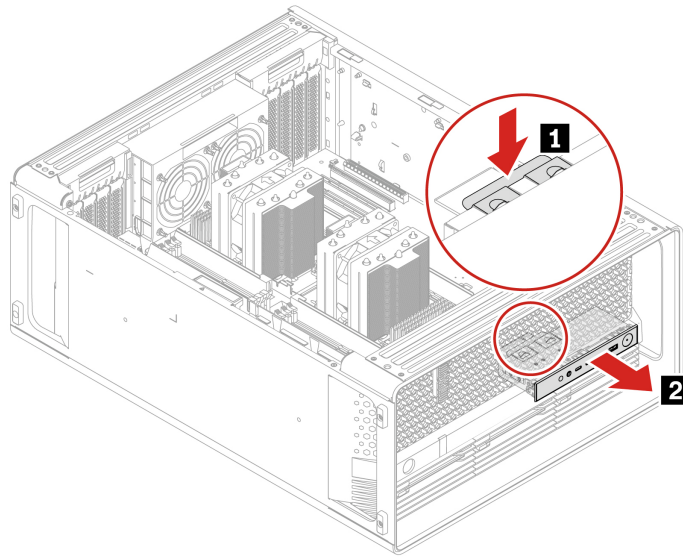
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.
4. Remove the front fan bracket. See “Front fan bracket” on page 40.

Removal steps

Remove the front panel IO assembly.



Lock kit for the front access bay

Prerequisite

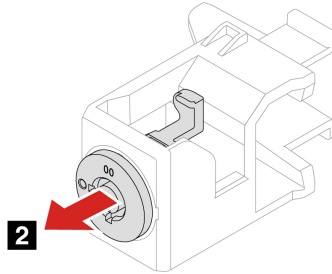
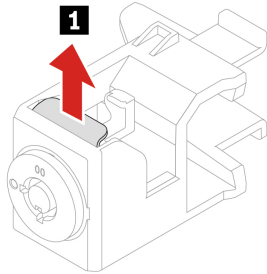
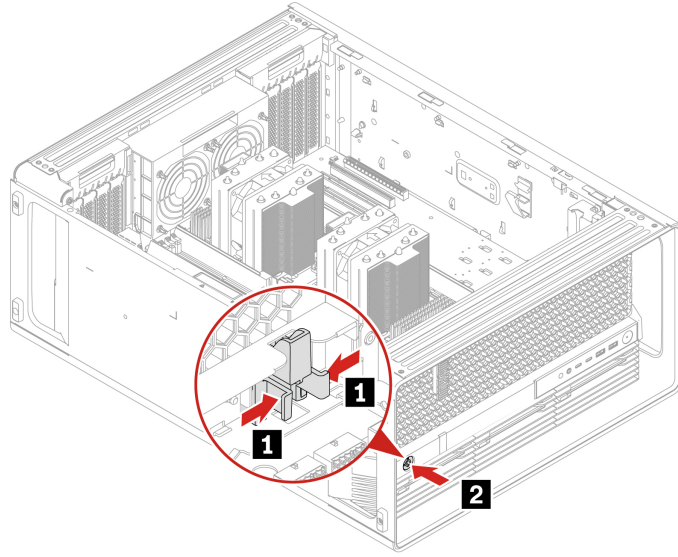
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.
4. Remove the front fan bracket. See “Front fan bracket” on page 40.

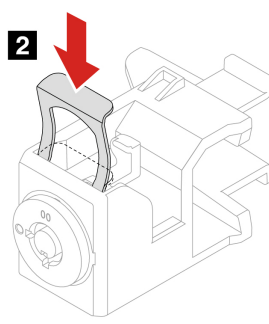
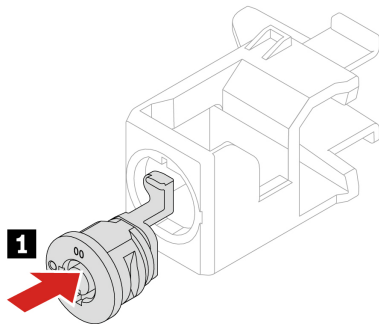
Removal steps

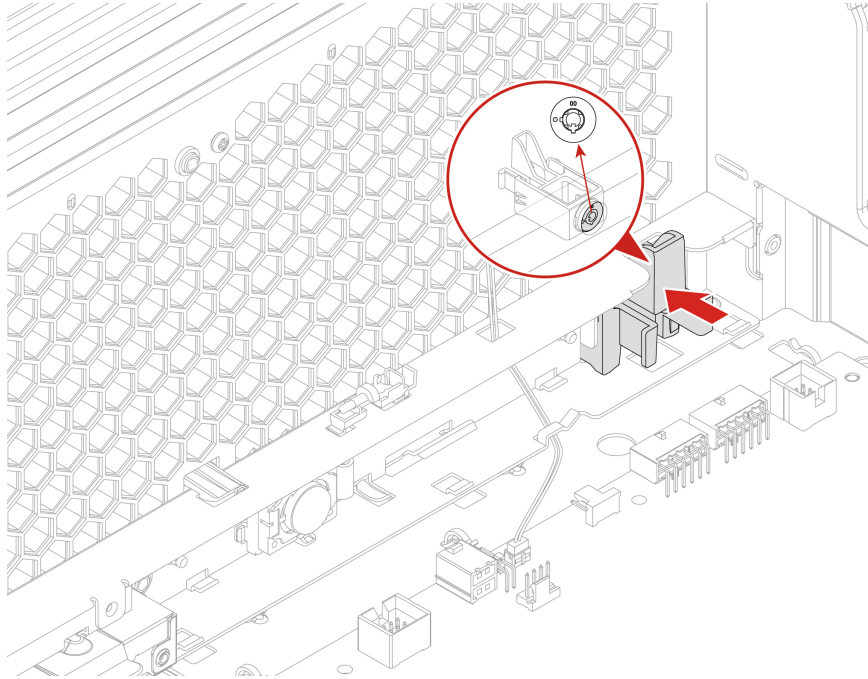
Remove the front access bay lock.



Installation steps

Install the front access bay lock.





Think LED holder and cable

Prerequisite

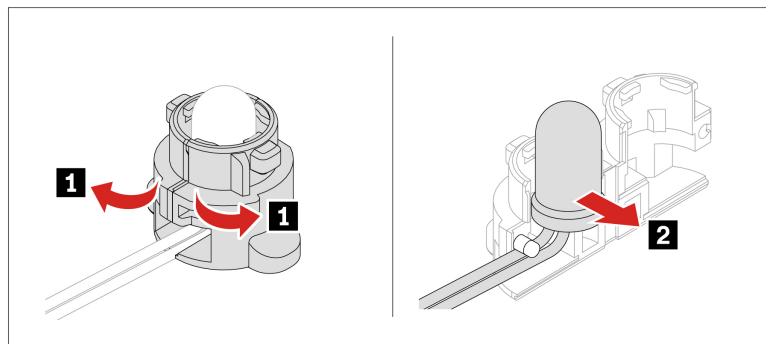
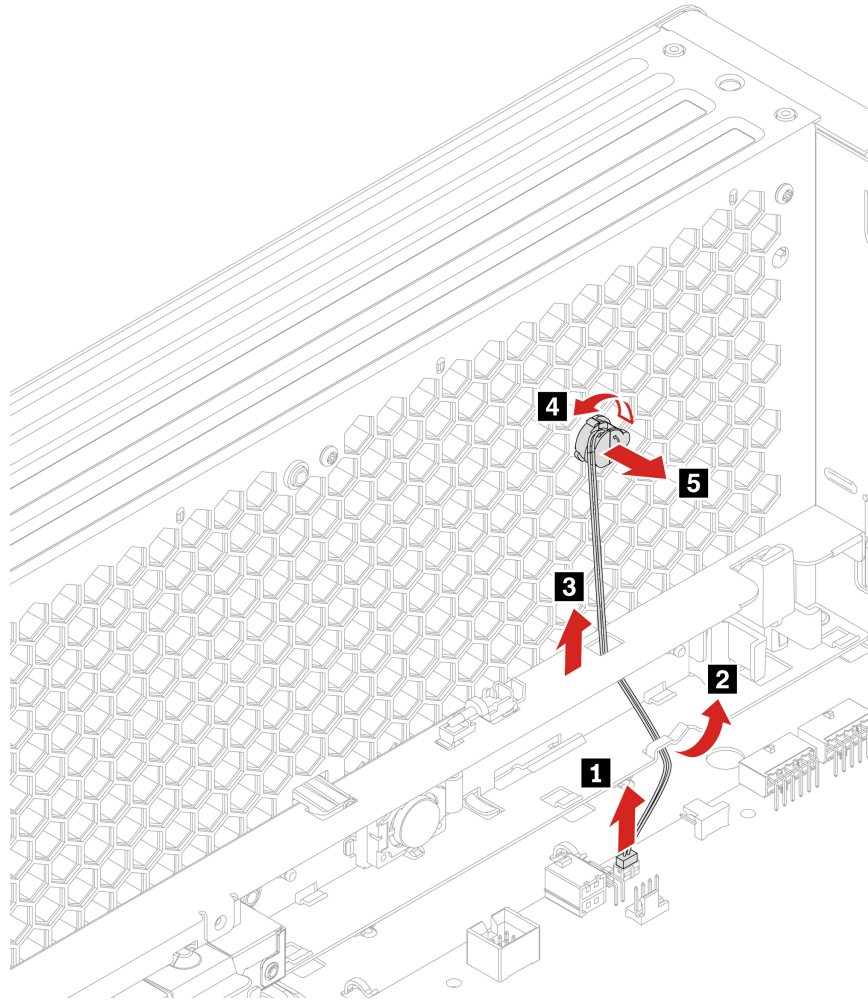
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.
4. Remove the front fan bracket. See “Front fan bracket” on page 40.

Removal steps

Remove the Think LED holder and cable.



Lock kit for the left side cover

Prerequisite

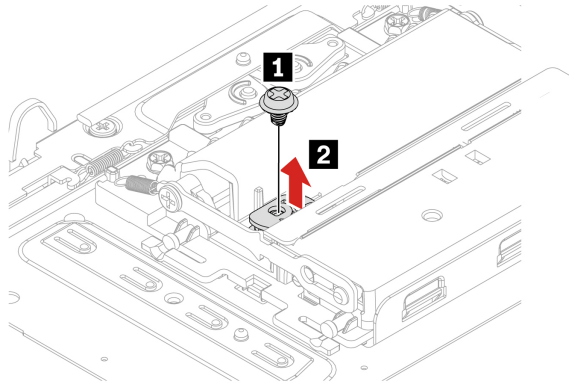
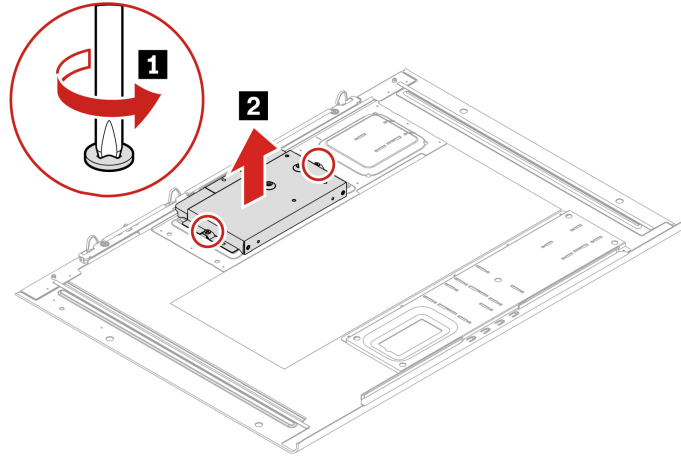
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the left side cover. See “Left side cover” on page 35.

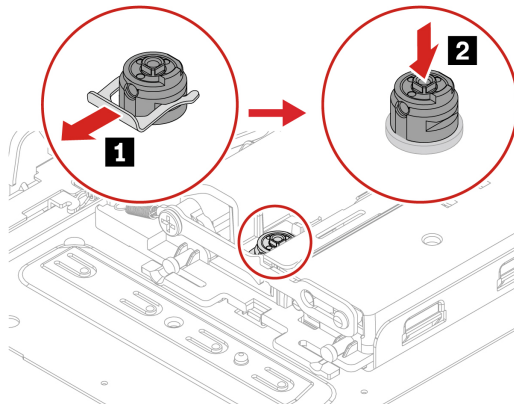
Removal steps

Remove the left side cover lock.

Note: Loosen the two screws that secure the lock handle cover. The two screws cannot be removed from the lock handle cover.

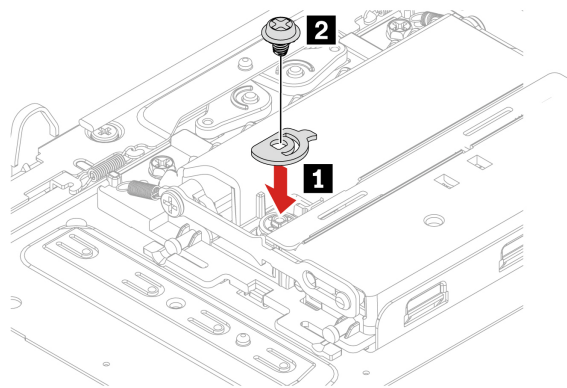
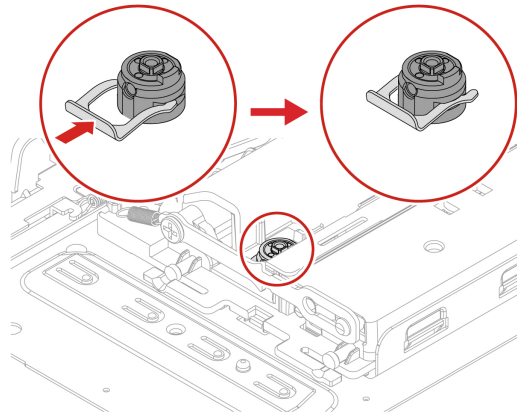
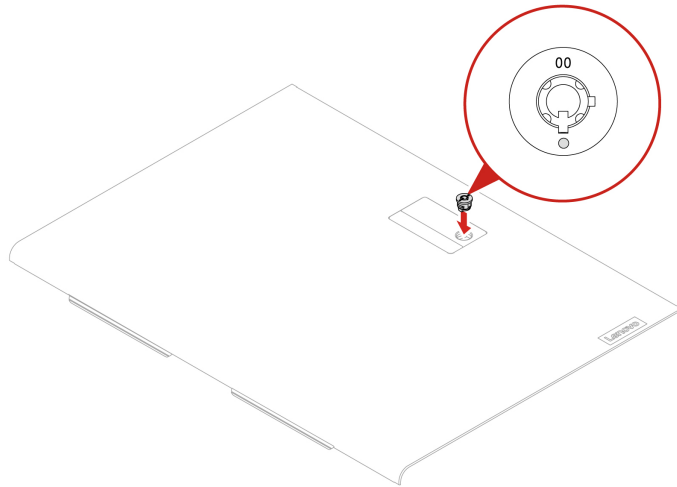


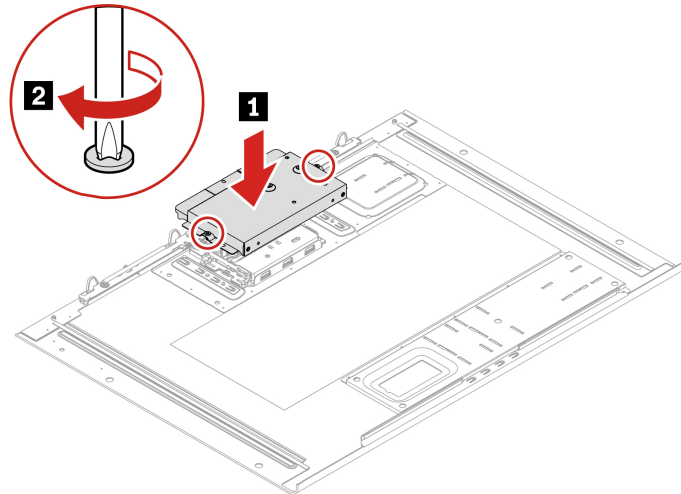
Screw (quantity)	Color	Torque
M3 x 4.2 mm, Zn coated (1)	Blue	5.0 ± 0.5 lb/in



Installation steps

Install the left side cover lock.





Hard disk drive in the front access bay

Prerequisite

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

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

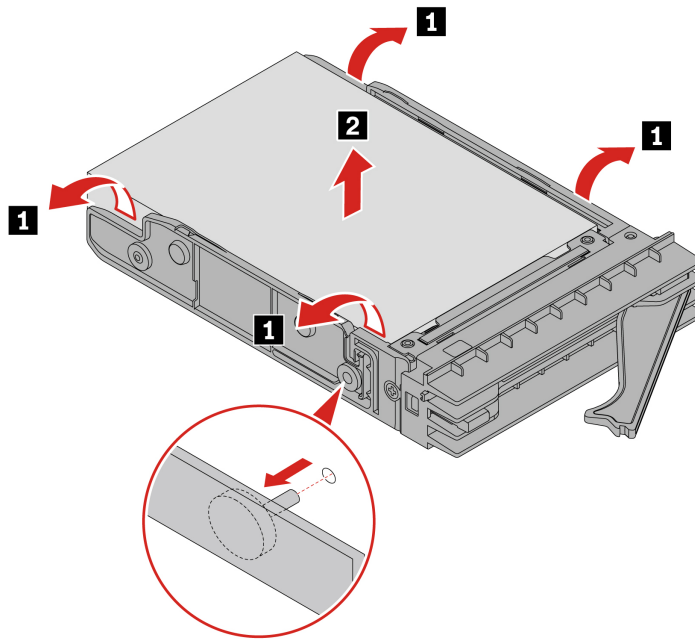
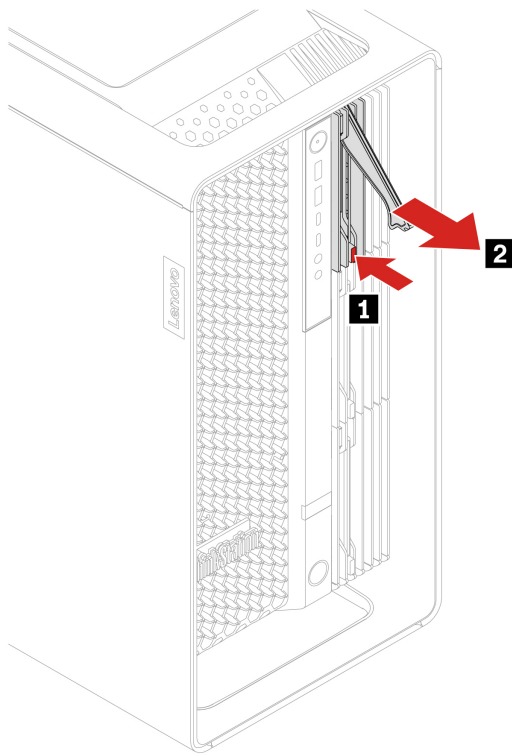
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive.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

For access, do the following:

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

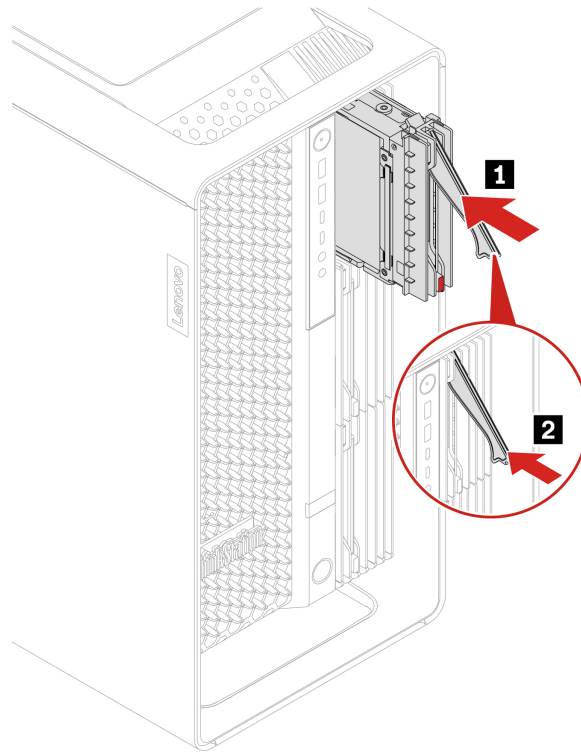
Removal steps of hard disk drive installed in the front access bay

You might need to use the key attached at the rear of the computer to unlock the front access bay and then remove the hard disk drive.



Installation steps of hard disk drive installed in the front access bay

Install the hard disk drive.



Hard disk drive in the PSU bay 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:

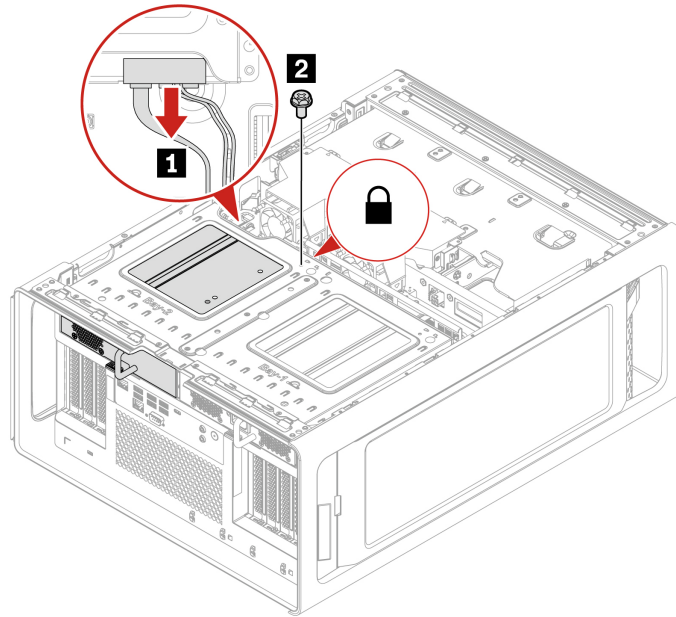
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive.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

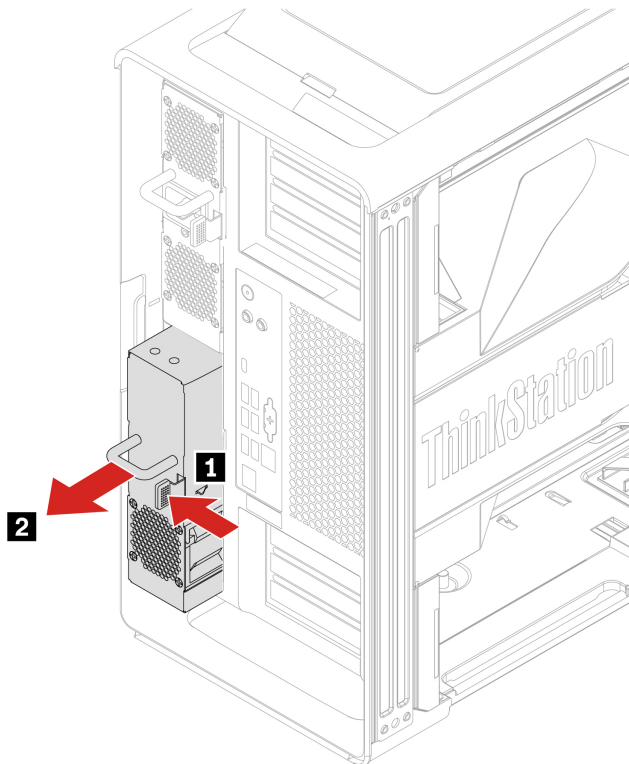
1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the right side cover. See “Right side cover” on page 54.

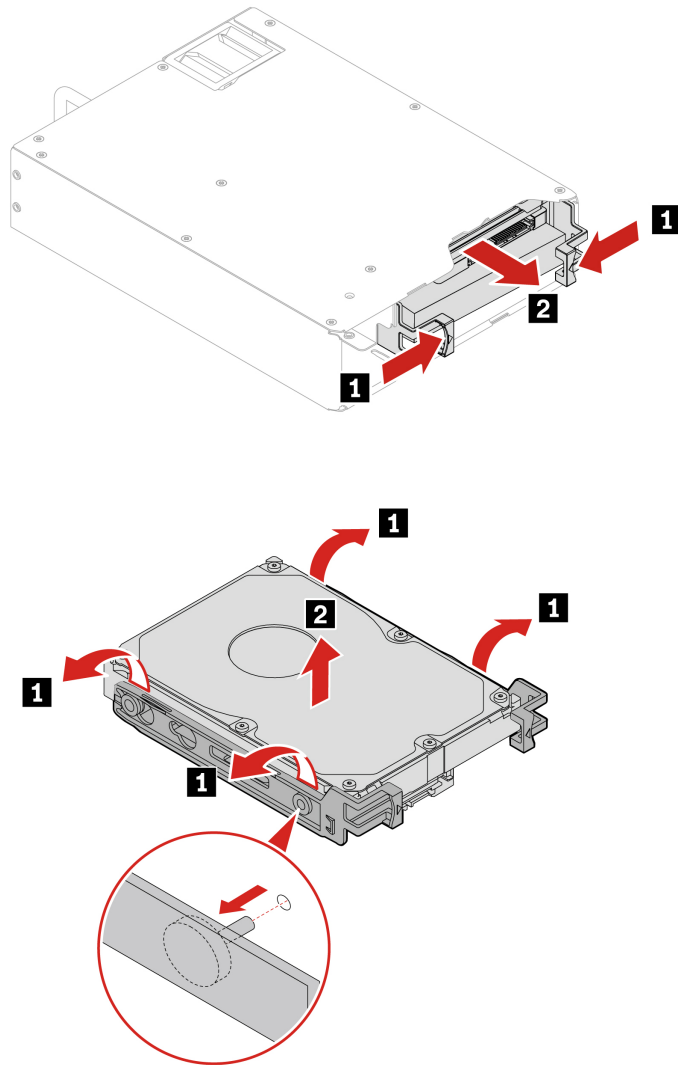
Removal steps

Remove the hard disk drive in the PSU bay storage enclosure.



Screw (quantity)	Color	Torque
M3 x 5 mm, Nickel coated (1)	Black	5.0 ± 0.5 lb/in





Right side cover

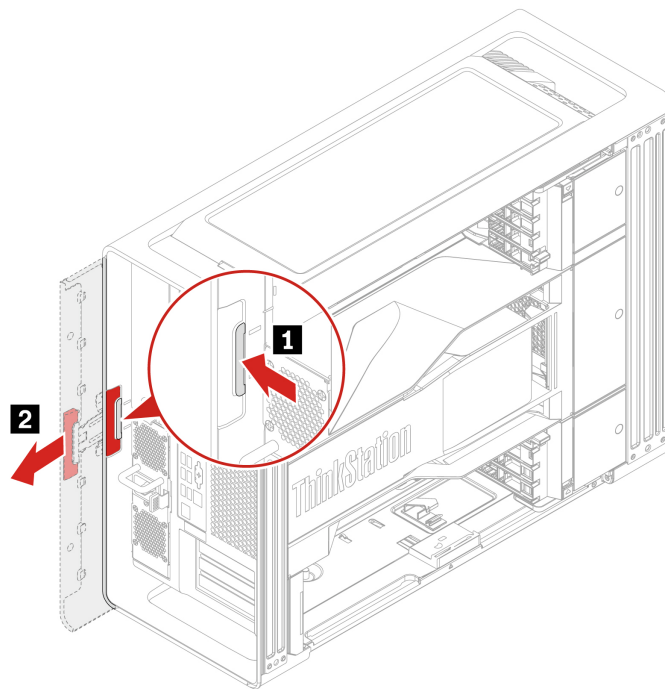
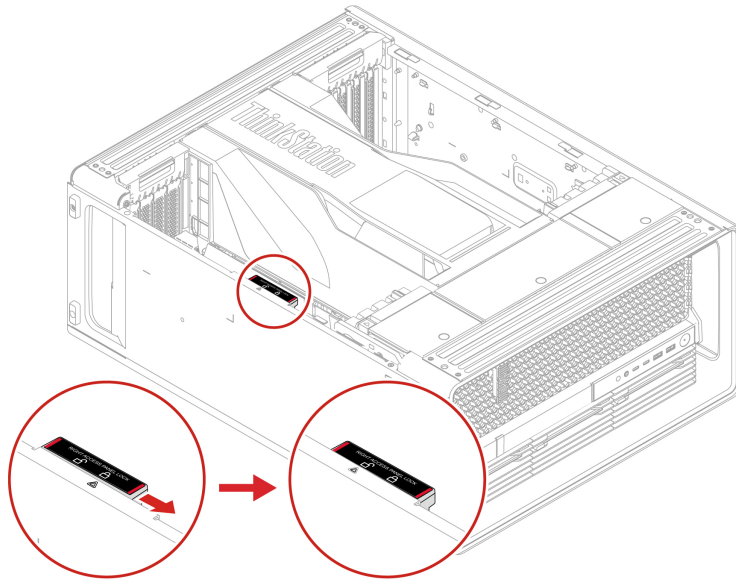
Prerequisite

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

For access, remove the left side cover. See “Left side cover” on page 35.

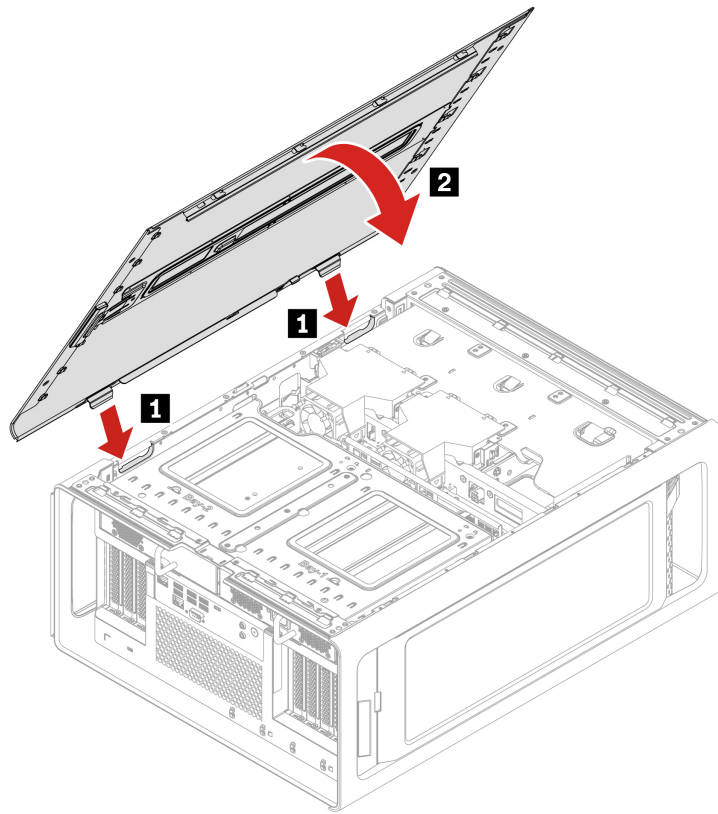
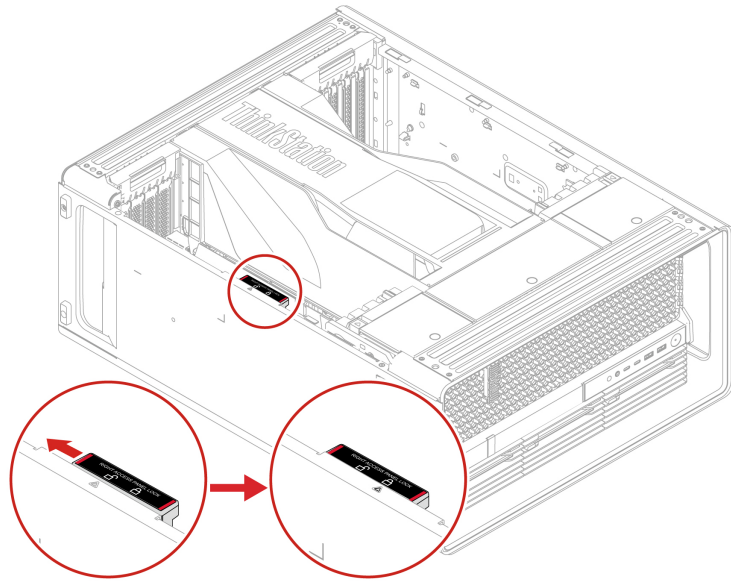
Removal steps

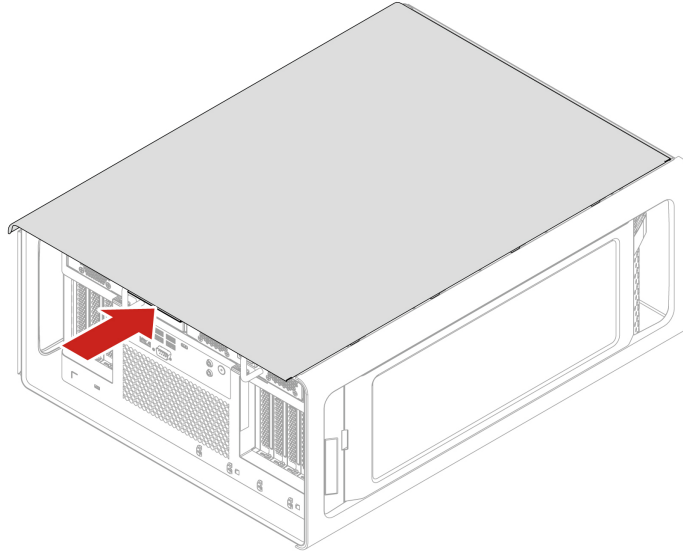
Remove the right side cover.



Installation steps

Install the right side cover.





Power distribution board and bracket

Prerequisite

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

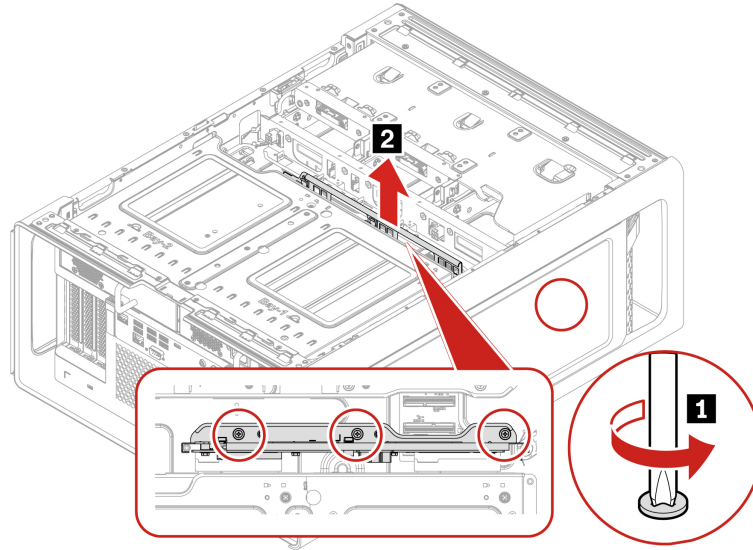
For access, do the following:

1. Remove the power supply assembly. See “Power supply assembly” on page 32.
2. Remove the left side cover. See “Left side cover” on page 35.
3. Remove the right side cover. See “Right side cover” on page 54.
4. Remove the PSU bay storage enclosure. See “Hard disk drive in the PSU bay storage enclosure” on page 52.

Removal steps

Loosen the three screws to remove the power distribution board and bracket.

Note: The three screws cannot be removed from the power distribution board bracket



BCB board and bracket

Prerequisite

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

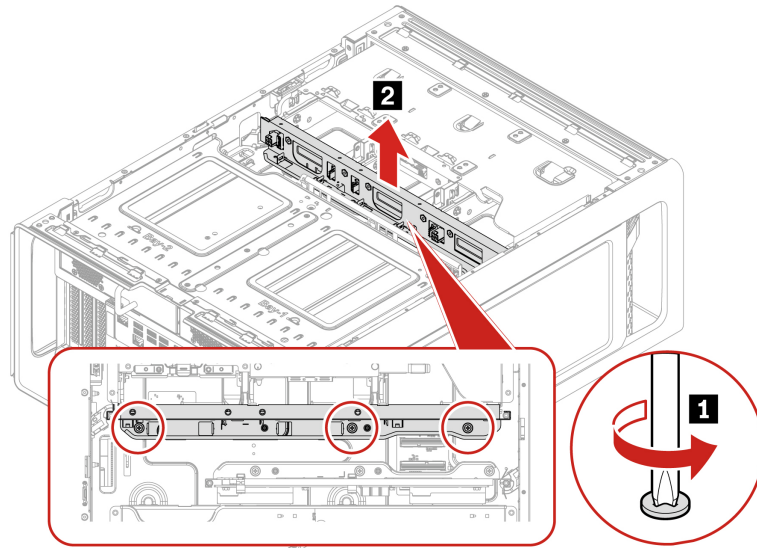
For access, do the following:

1. Remove the storage drives installed in the front access bay (if any). See “Hard disk drive in the front access bay” on page 50, “M.2 solid-state drive in the front access bay” on page 60, and “E1.S solid-state drive in the front access bay” on page 62.
2. Remove the left side cover. See “Left side cover” on page 35.
3. Remove the right side cover. See “Right side cover” on page 54.
4. Remove the storage drive fan. See “Storage fan assembly” on page 59.

Removal steps

Loosen the three screws to remove the BCB board and bracket.

Note: The three screws cannot be removed from the BCB board bracket



Storage fan assembly

Prerequisite

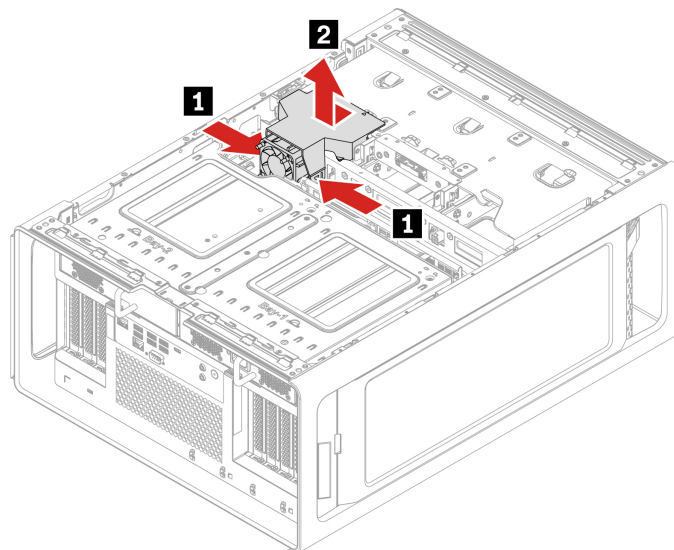
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the right side cover. See “Right side cover” on page 54.
3. Disconnect the storage fan cable from the system board. See “System board” on page 28.

Removal steps

Remove the storage fan assembly.



M.2 solid-state drive in the front access bay

Prerequisite

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

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

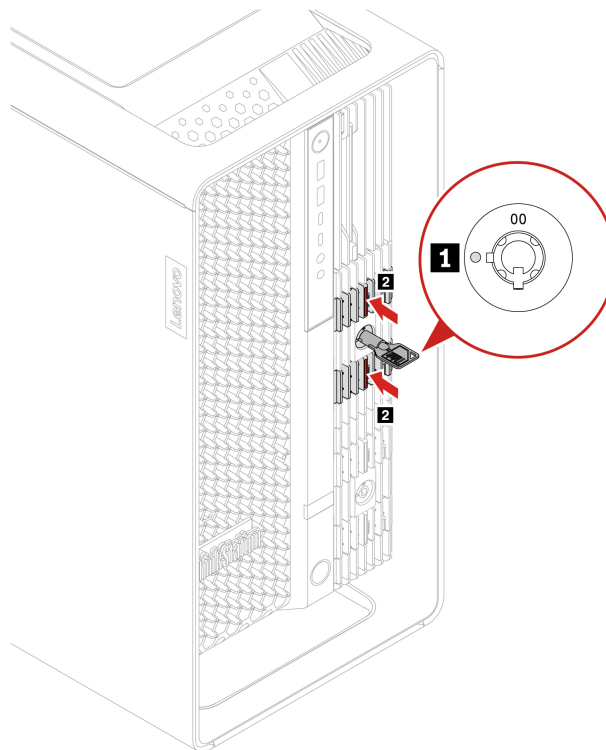
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive.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

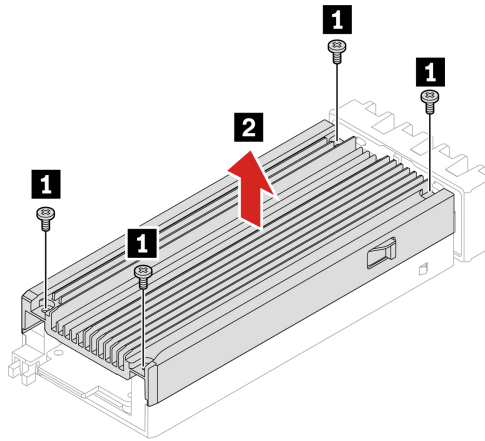
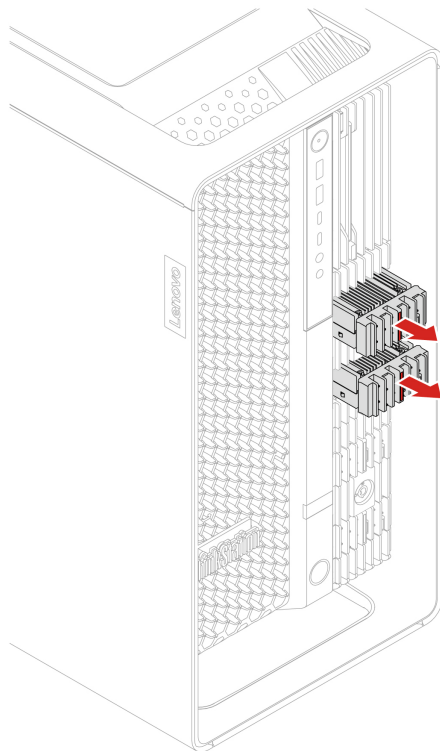
For access, do the following:

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

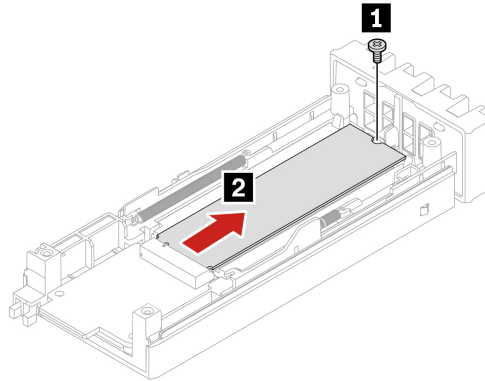
Removal steps

Remove the M.2 solid-state drive.





Screw (quantity)	Color	Torque
M2 x 4.5 mm, Zn coated (4)	Black	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

E1.S solid-state drive in the front access bay

Prerequisite

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

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

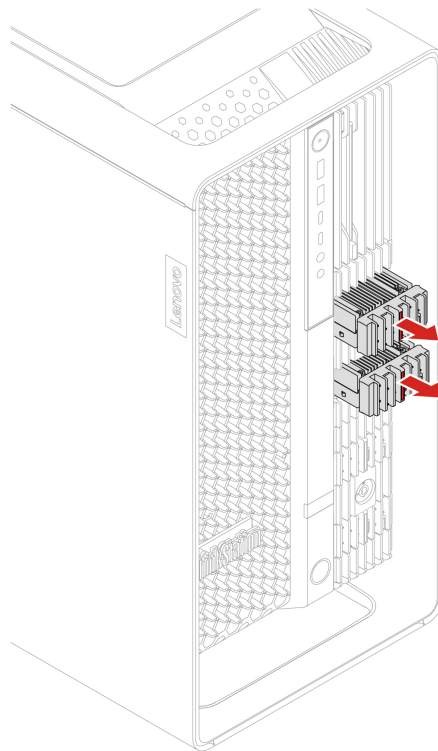
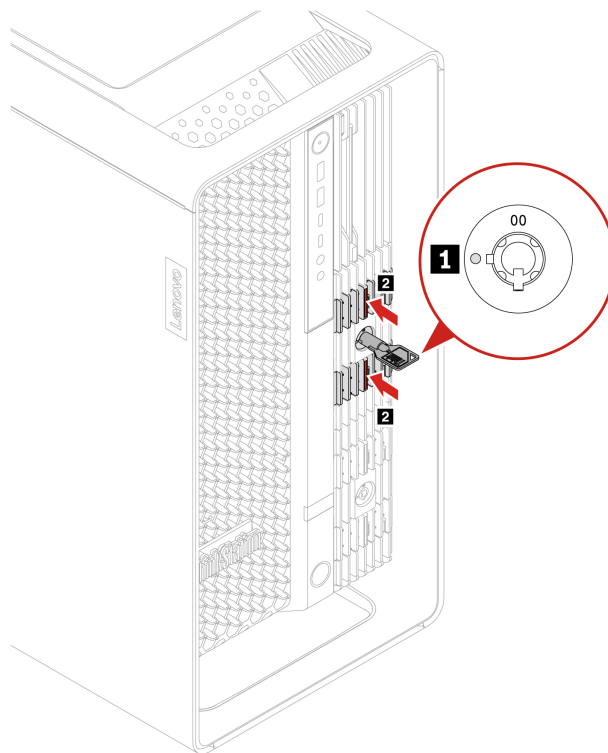
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive.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

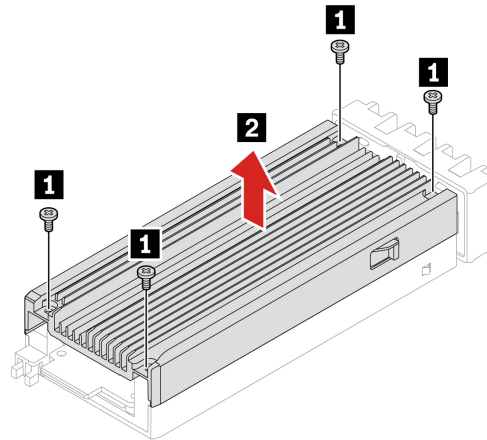
For access, do the following:

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

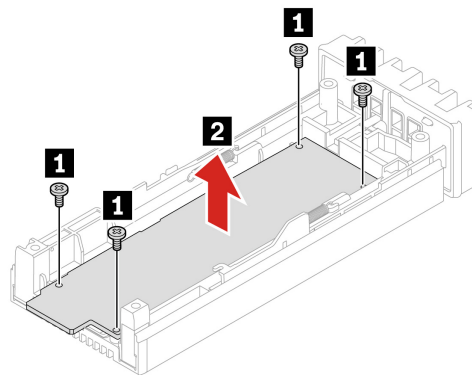
Removal steps

Remove the E1.S solid-state drive.





Screw (quantity)	Color	Torque
M1.6 x 4 mm, Zn coated (4)	Black	0.8± 0.1 lb/in



Screw (quantity)	Color	Torque
M1.6 x 4 mm, Zn coated (4)	Black	0.8± 0.1 lb/in

Dual M.2 or E1.S SSD enclosure

Prerequisite

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

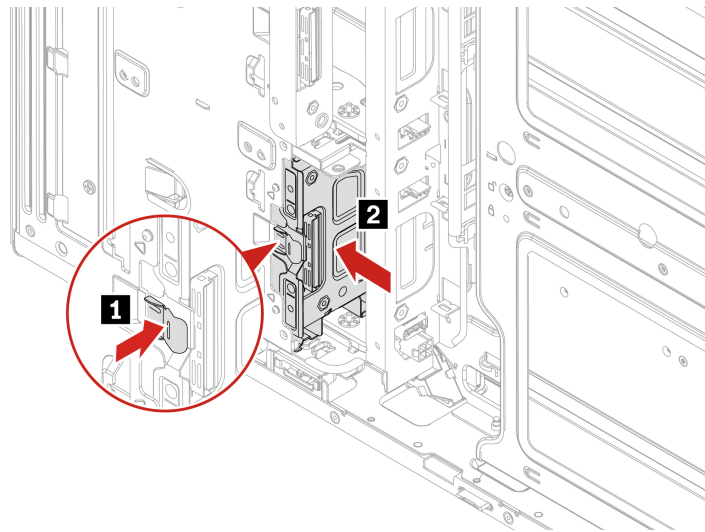
For access, do the following:

1. Remove the M.2 solid-state drive and E1.S solid-state drive installed in the front access bay (if any). See “M.2 solid-state drive in the front access bay” on page 60 and “E1.S solid-state drive in the front access bay” on page 62.
2. Remove the left side cover. See “Left side cover” on page 35.
3. Remove the right side cover. See “Right side cover” on page 54.
4. Remove the storage fan assembly. See “Storage fan assembly” on page 59.

5. Disconnect the cable from the dual M.2 or E1.S SSD enclosure. See “System board” on page 28.

Removal steps

Remove the dual M.2 or E1.S SSD enclosure.



Onboard M.2 solid-state drive and its heatsink kit

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:

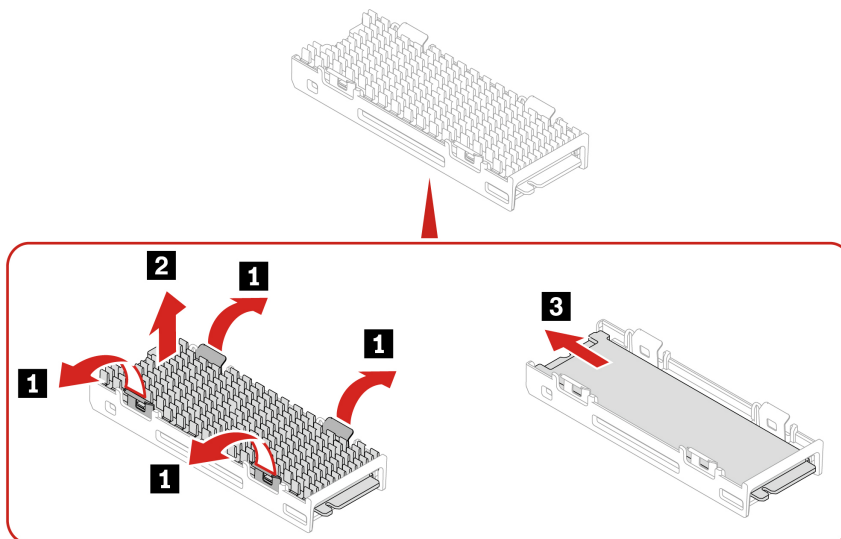
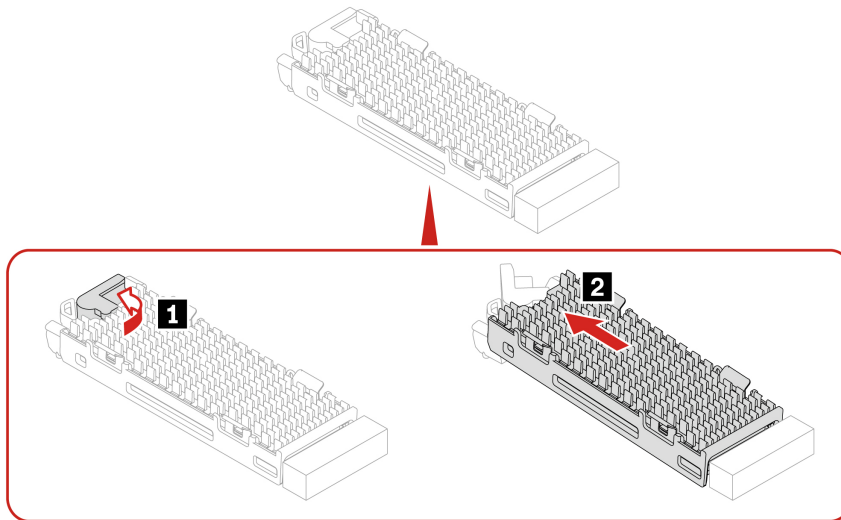
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. 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 left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.
4. Remove the front fan bracket. See “Front fan bracket” on page 40.

Removal steps

Remove the onboard M.2 solid-state drive.

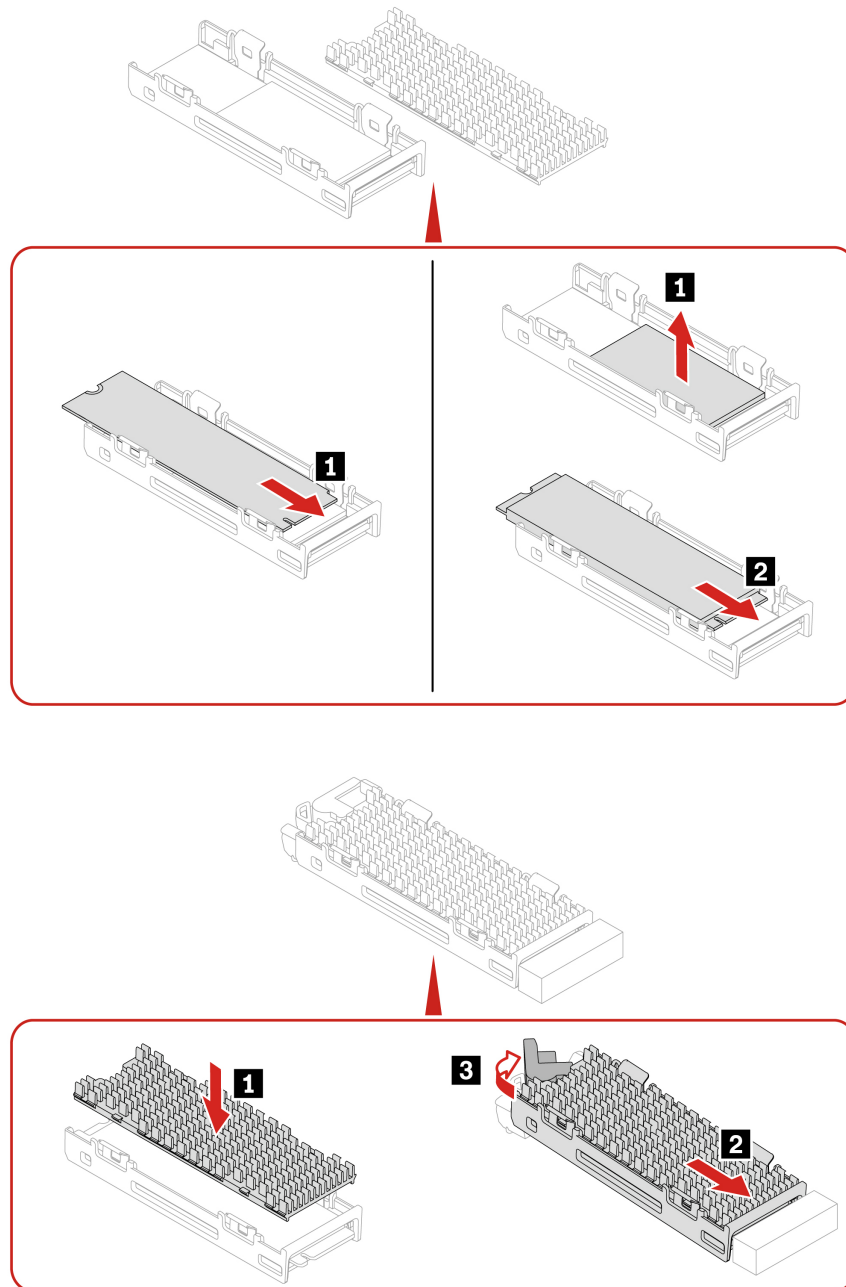


Installation steps

Install the onboard M.2 solid-state drive.

Notes:

- Remove the protective film from both heatsink and thermal pad before installing the onboard M.2 solid-state drive.
- If the new M.2 solid-state drive is double-sided, remove the 1.5-mm thick thermal pad upward first.



Memory fan duct

Prerequisite

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

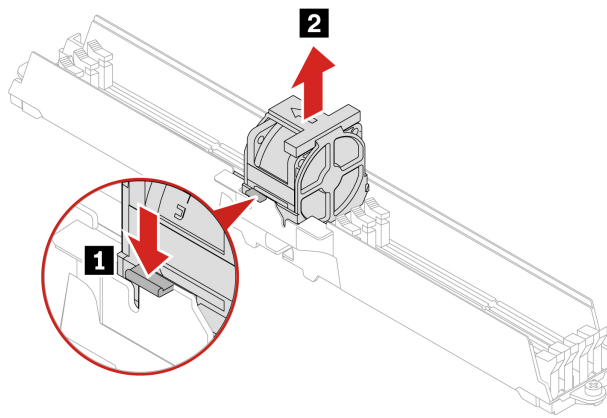
For access, remove the following parts in order:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the front fan assembly. See “Front fan assembly” on page 39.
4. Remove the front fan bracket. See “Front fan bracket” on page 40.

5. Remove the rear fan assembly. See “Rear fan assembly” on page 42.
6. Disconnect the cable from the system board. See “System board” on page 28.

Replacement steps

Remove the memory fan duct.



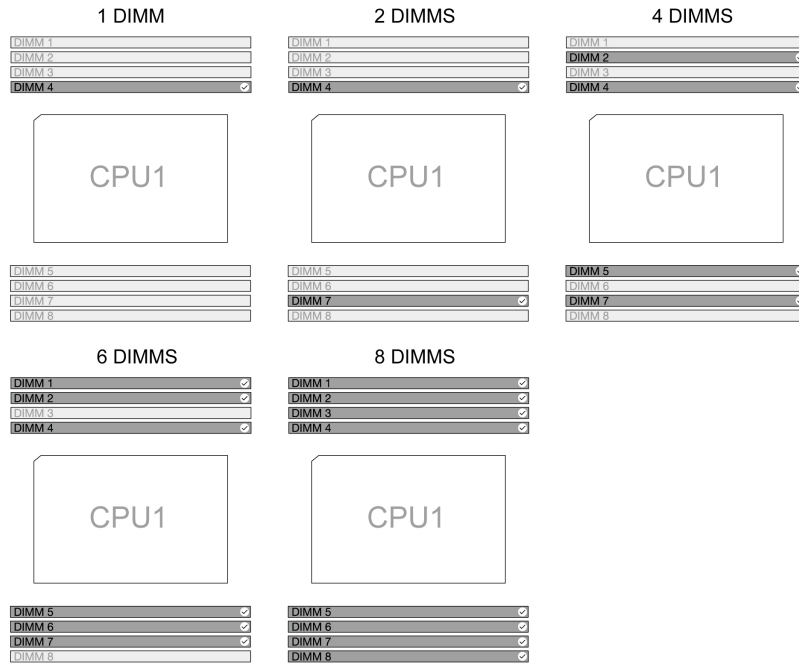
Memory module

Prerequisite

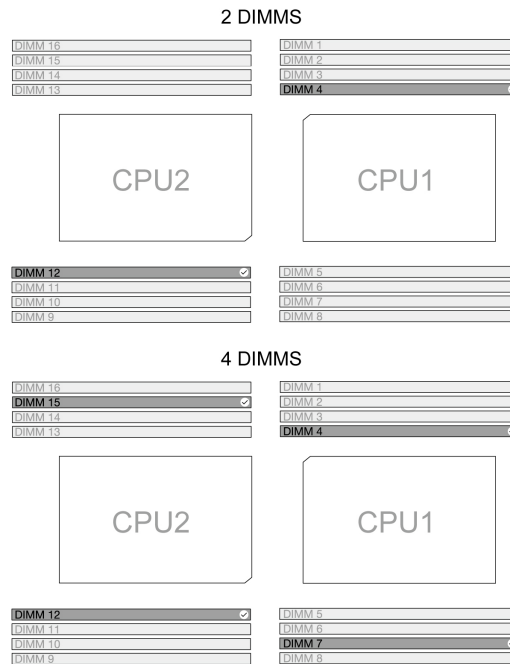
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

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

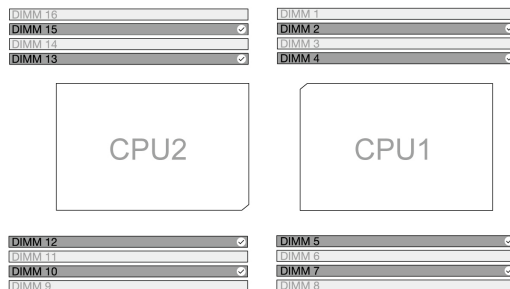
- 1 CPU



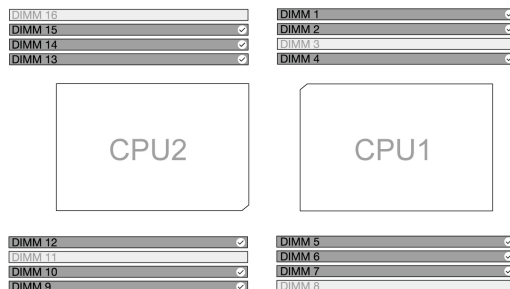
- 2 CPUs



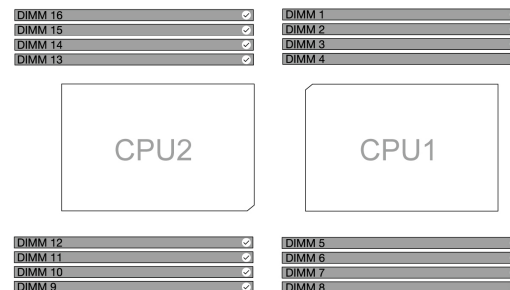
8 DIMMS



12 DIMMS



16 DIMMS

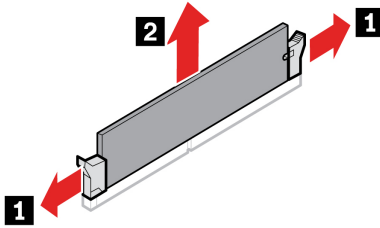


For access, remove the following parts in order:

- Remove the left side cover. See “Left side cover” on page 35.
- Remove the CPU duct. See “CPU duct” on page 38.
- Remove the front fan assembly. See “Front fan assembly” on page 39.
- Remove the front fan bracket. See “Front fan bracket” on page 40.
- Remove the rear fan assembly. See “Rear fan assembly” on page 42.
- Remove the memory fan duct. See “Memory fan duct” on page 67.

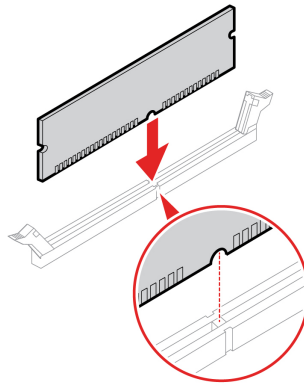
Removal steps

Remove the memory module.



Installation steps

Install the memory module.



PCIe bracket

Prerequisite

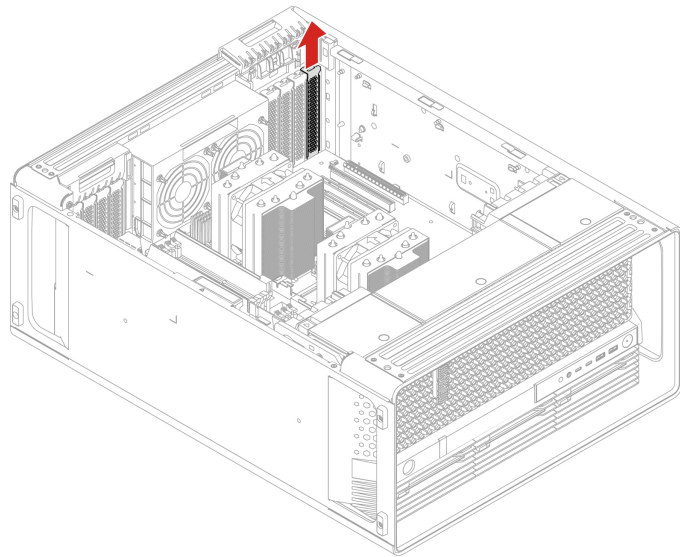
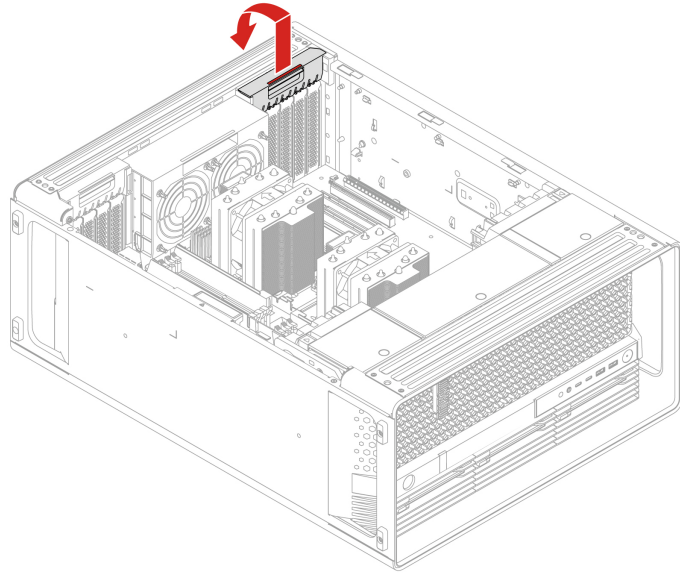
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.

Removal steps

Remove the PCIe bracket.



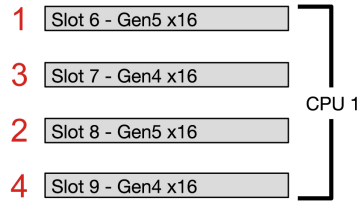
PCIe card

Prerequisite

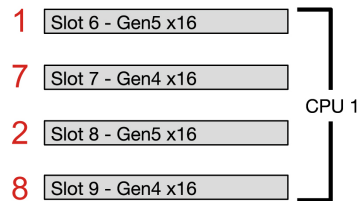
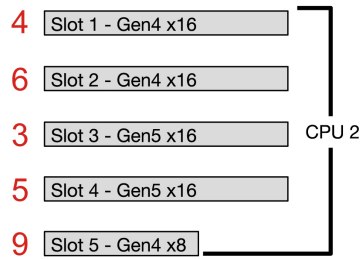
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

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

- **1 CPU**



• 2 CPUs



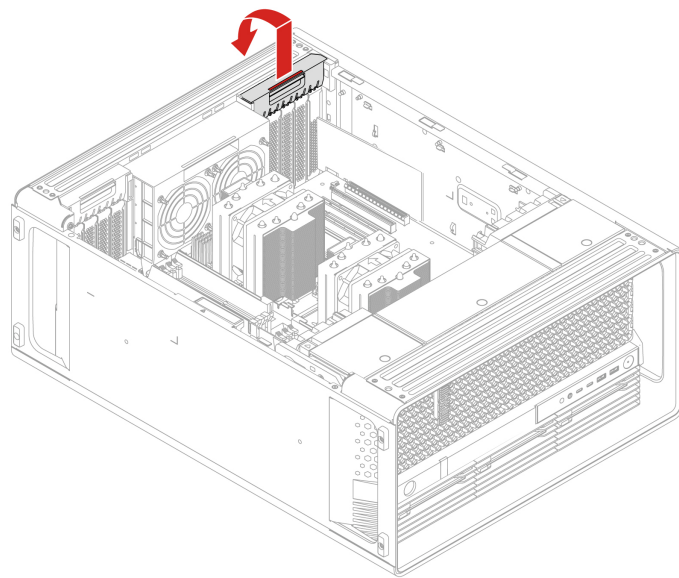
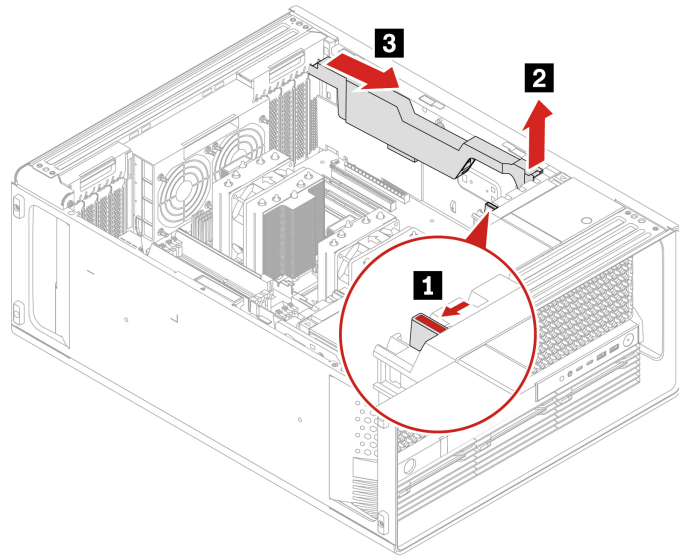
For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the power cable from the PCIe card, if any.

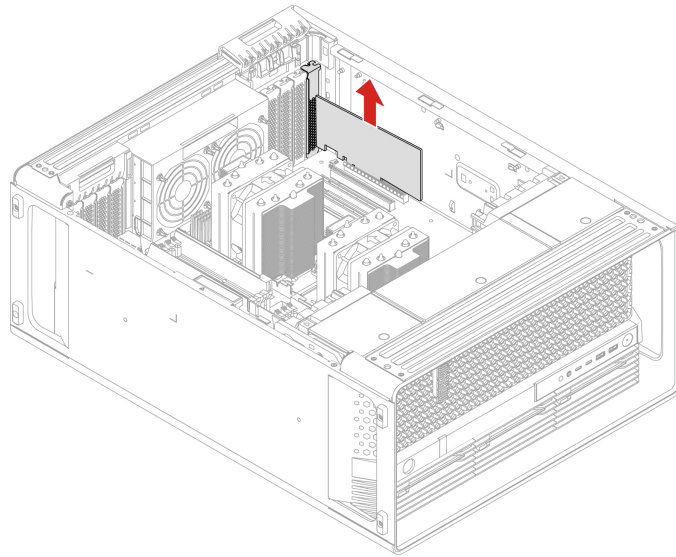
Removal steps

Remove the PCIe card.

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



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.



For cable connection guide, see “Cable connection” on page 78.

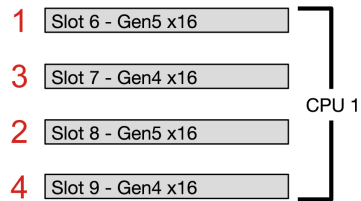
Full-length PCIe card

Prerequisite

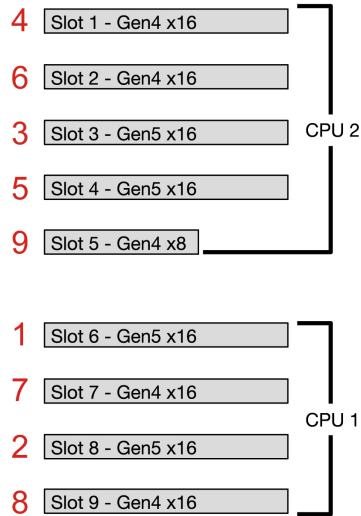
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

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

- **1 CPU**



- **2 CPUs**

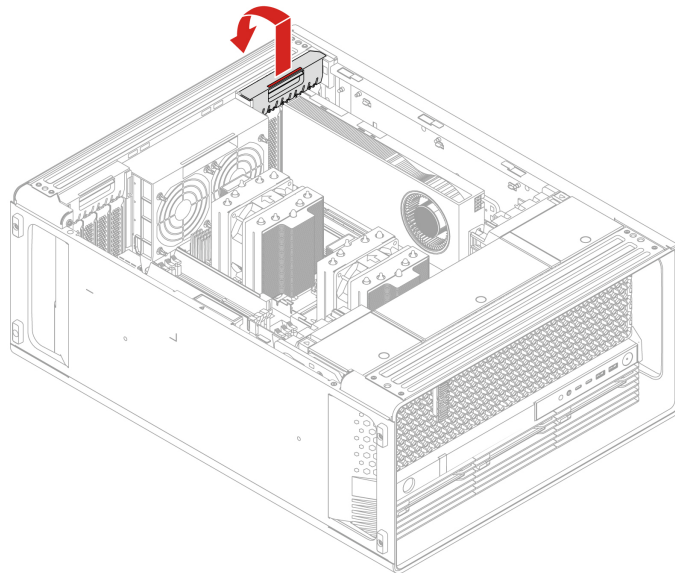


For access, do the following:

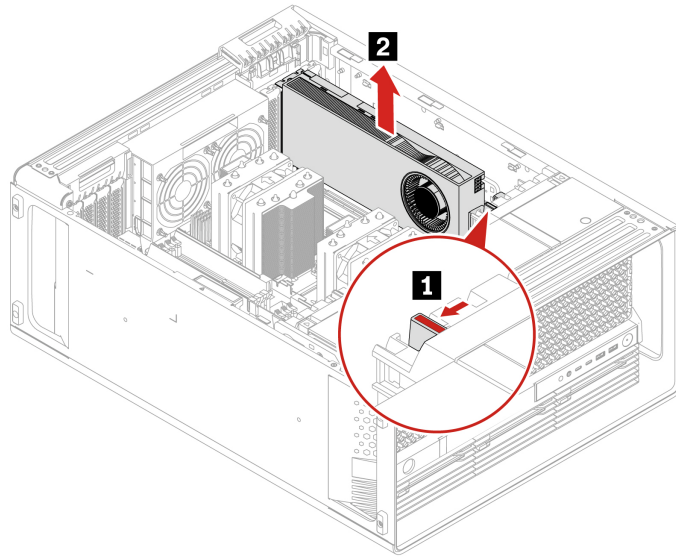
1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.
3. Remove the power cable from the PCIe card, if any.

Removal steps

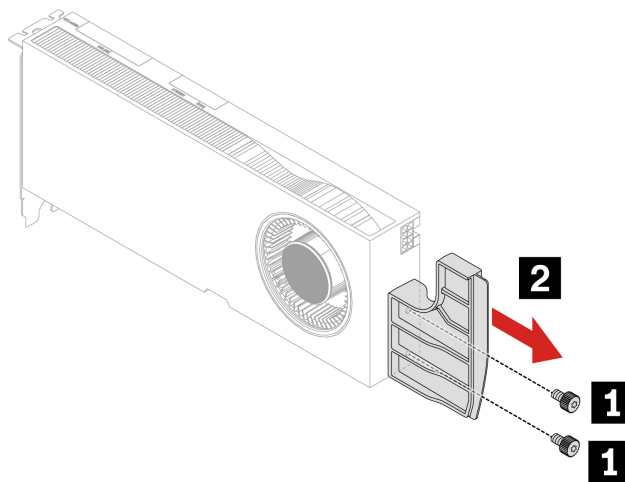
Remove the full-length PCIe card.



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.



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



Screw (quantity)	Color	Torque
M3 x 5.5 mm, Nickel coated (2)	Black	5.5 ± 0.5 lb/in

For cable connection guide, see “Cable connection” on page 78.

Super capacitor module

Prerequisite

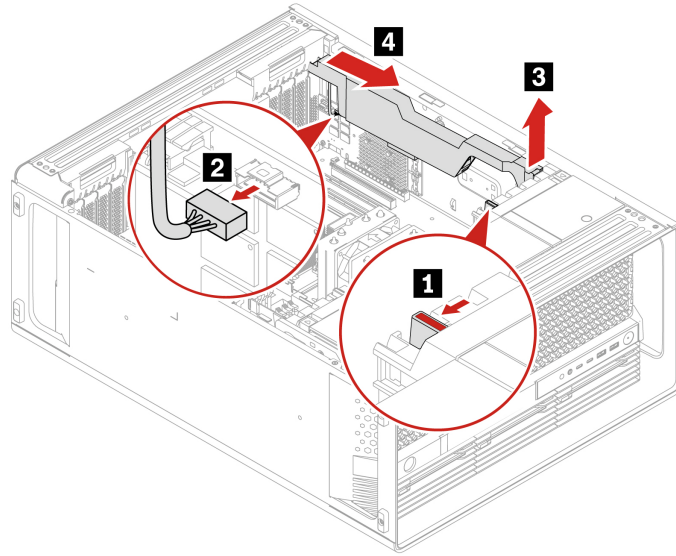
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the left side cover. See “Left side cover” on page 35.
2. Remove the CPU duct. See “CPU duct” on page 38.

Removal steps

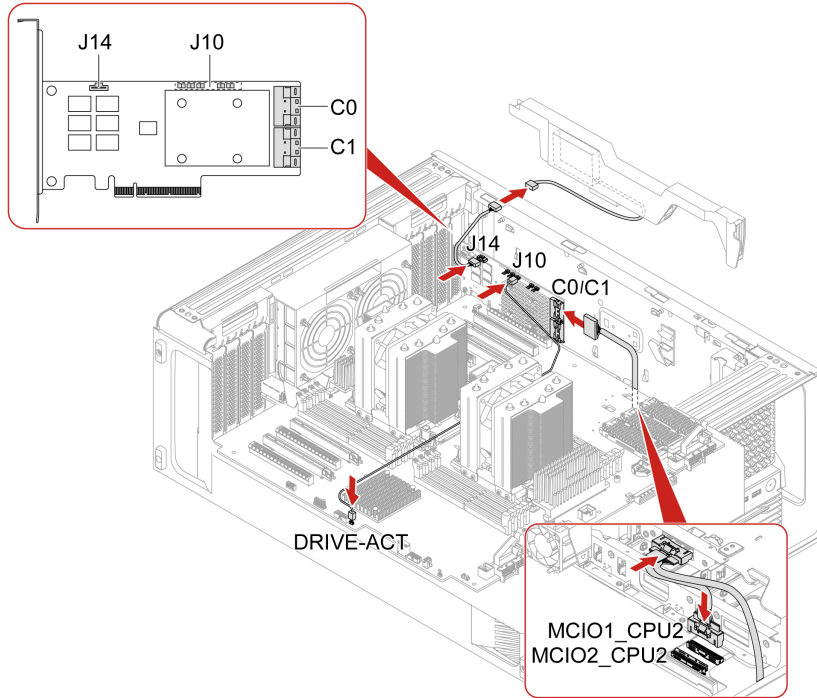
Remove the super capacitor module.



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.

Cable connection

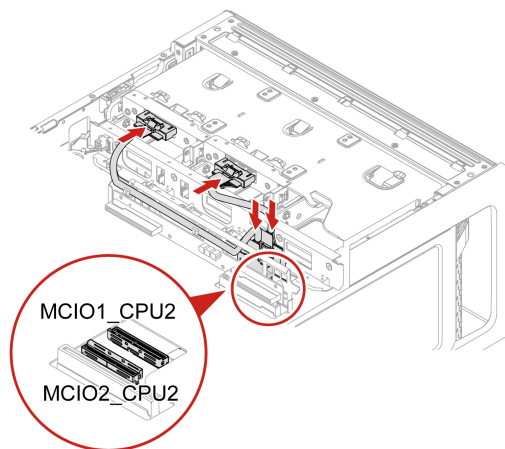
Note: The connectors on the cards or system board might look slightly different from the illustrations.



Notes:

- C0 connector priority is higher than C1 connector.
- MCIO connector 1 priority is higher than MCIO connector 2.
- Front access bay 2+5 priority is higher than front access bay 3+6 .

Figure 3. Cable connection for BCM9560 RAID AIC



Notes:

- MCIO connector 1 priority is higher than MCIO connector 2.
- Front access bay 2+5 priority is higher than front access bay 3+6.

Figure 4. Cable connection for M.2/E1.S SSD enclosure

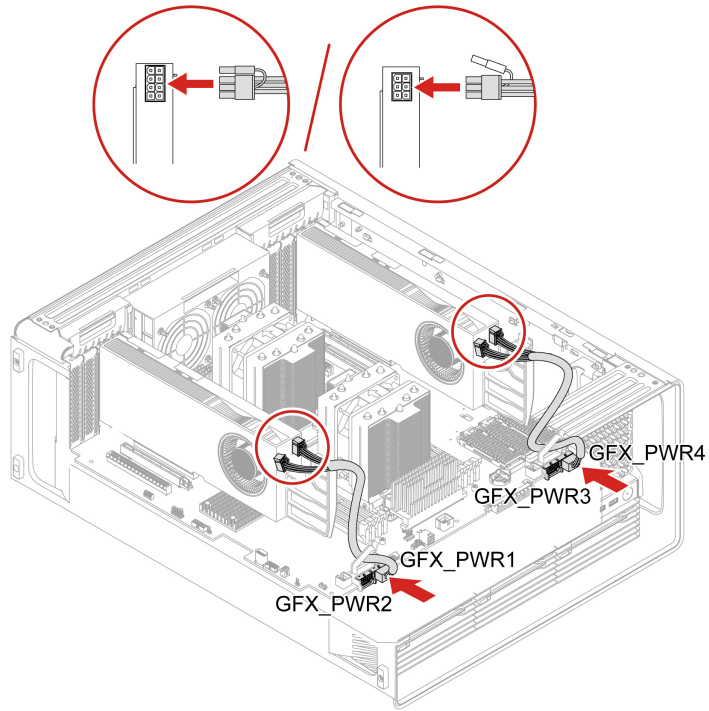


Figure 5. GFX GV100/RTX A5500/RTX A4500 Aux power connection

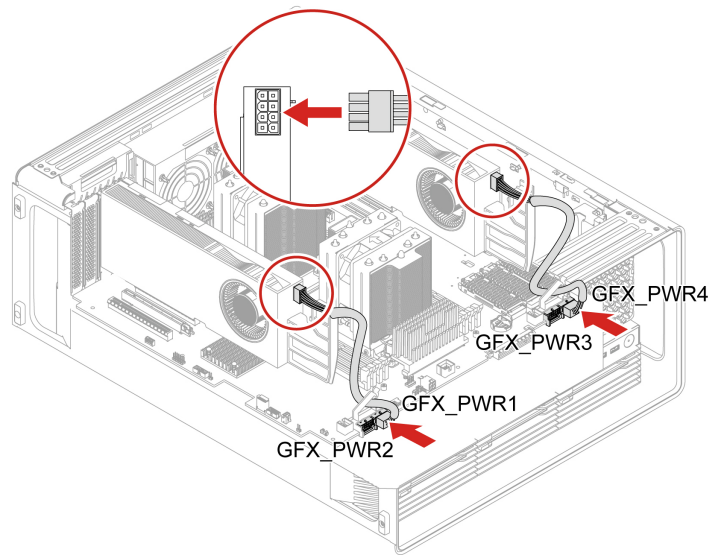
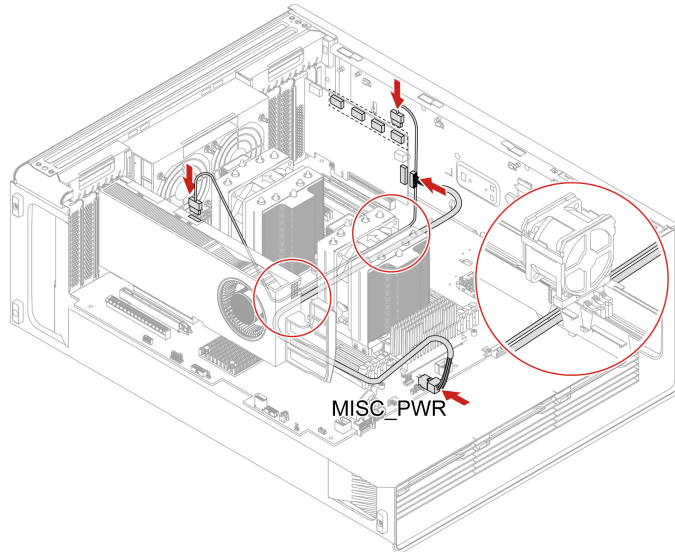


Figure 6. GFX RTX A6000 Aux power connection



Note: When the NVIDIA Quadro SYNC II card and the graphics card are located in the upper PCIe card area and lower PCIe card area respectively, ensure that you remove the memory fan duct to route the SYNC II card cable and power cable through the hole of the memory fan duct as illustrated above. See “Memory fan duct” on page 67.

Figure 7. Cable connection for NVIDIA Quadro SYNC II card

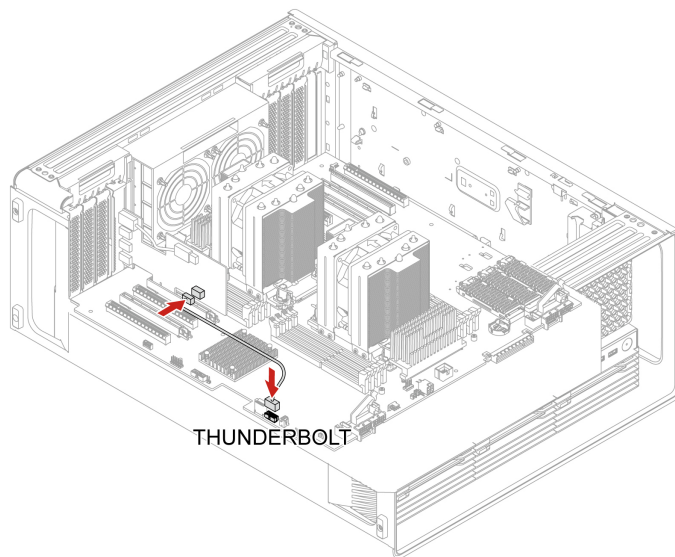


Figure 8. Cable connection for Thunderbolt card

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?
Product documentation: <ul style="list-style-type: none">• <i>Safety and Warranty Guide</i>• <i>Generic Safety and Compliance Notices</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: <ul style="list-style-type: none">• 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

Lenovo diagnostic tools

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

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

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

Call Lenovo

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

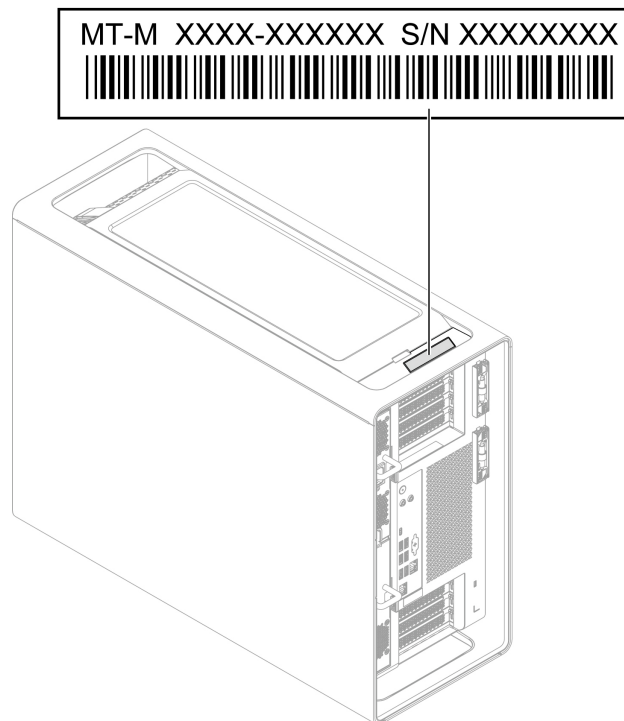
Before you contact Lenovo

Prepare the following before you contact Lenovo:

1. Record the problem symptoms and details:
 - What is the problem? Is it continuous or intermittent?
 - Any error message or error code?
 - What operating system are you using? Which version?

- Which software applications were running at the time of the problem?
 - Can the problem be reproduced? If so, how?
2. Record the system information:
- Product name
 - Machine type and serial number

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



Lenovo Customer Support Center

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

Telephone numbers

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

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

Certification-related information

Product name: ThinkStation PX

Machine types: 30EU and 30EV

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 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.

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>.

Appendix A. Supplemental information about the Ubuntu operating system

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

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

Access the Lenovo Limited Warranty

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

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

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

```
/opt/Lenovo
```

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

Access the Ubuntu help system

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

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

<https://www.ubuntu.com>

Get support information

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

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

<https://pcsupport.lenovo.com>

Access open-source information

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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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