User Guide

ThinkCentre M90t Gen6

About this document

This guide applies to the Lenovo product models listed below. Illustrations in this guide may look slightly different from your product model.

Model name	Machine types (MT)
ThinkCentre M90t Gen6	12YR, 12YS, 12YV, 12YW

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*
  - For computers purchased in mainland China: https://iknow.lenovo.com.cn/detail/dc_191404.html
  - For computers purchased outside mainland China: https://pcsupport.lenovo.com/docs/generic_notices
- *Setup Guide (if provided with your computer)*

Notes:

- Illustrations in this guide may look slightly different from your product model.
- For more compliance information, refer to:
  - For computers purchased in mainland China

    Generic Safety and Compliance Notices at https://iknow.lenovo.com.cn/detail/dc_191404.html
  - For computers purchased outside mainland China

    Regulatory Notice at https://support.lenovo.com/docs/common_commercial_rnhttps://support.lenovo.com/docs/common_consumer_dt_rn and *Generic Safety and Compliance Notices* at https://www.lenovo.com/compliance
- Depending on the model, some optional accessories, features, and software programs might not be available on your computer.
- Depending on the version of the operating systems and programs, some user interface instructions might not be applicable to your computer.
- Documentation content is subject to change without notice. Lenovo makes constant improvements to the documentation of your computer, including this *User Guide*. To get the latest documentation, go to:
  - For computers purchased in mainland China: https://newsupport.lenovo.com.cn
  - For computers purchased outside mainland China: https://pcsupport.lenovo.com

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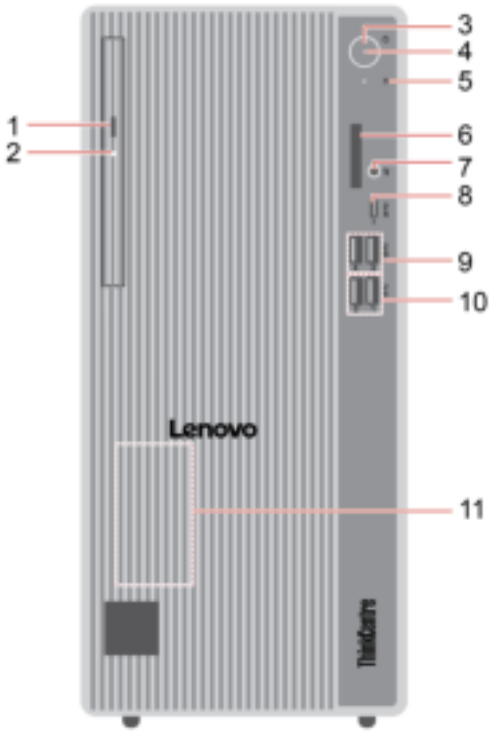
Chapter 1. Meet your computer

Front



Item	Description	Item	Description
1	Optical drive eject button*	2	Optical drive activity indicator*
3	Power button	4	Power indicator
5	Storage drive activity indicator	6	SD-card slot*
7	Headset connector	8	USB-C ® connector (USB 20Gbps)
9	USB-A connector (USB 5Gbps)	10	USB-A connector (USB 10Gbps)
11	Internal speaker		

* 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.

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USB device	Data rate (Gbit/s)
Thunderbolt 3	40
Thunderbolt 4	40

Power indicator

Show the system status of your computer.

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

Headset connector

The headset connector is compatible with:

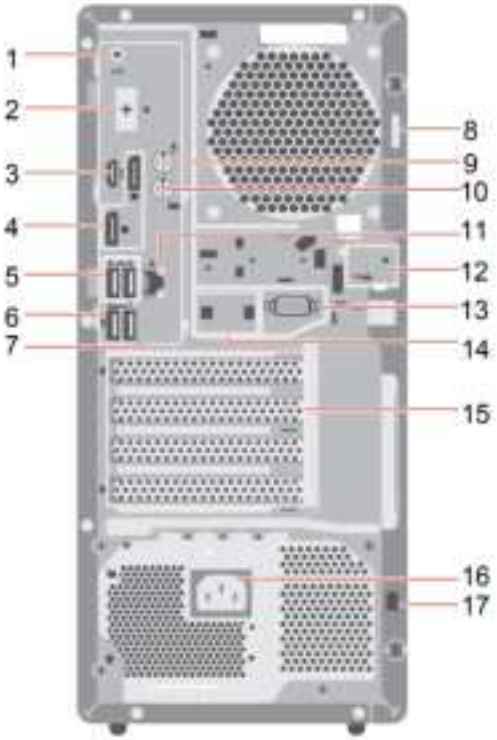
- Headphones or earphones with a 3.5mm (0.14 inch), TRS (3-pole) plug
- Headsets with a 3.5mm (0.14 inch), CTIA-compliant TRRS (4-pole) plug or OMTP-compliant TRRS (4-pole) plug

Note: This headset connector does not support standalone external microphones with a TRS (3-pole) plug.

Related topics

- “USB specifications” on page 5.

Rear



Item	Description	Item	Description
1	Audio line-out connector	2	Optional connector*
3	HDMI™ out connector	4	DisplayPort™ out connectors
5	USB-A connector (Hi-Speed USB)	6	USB-A connector (USB 5Gbps)
7	USB-A connector (USB 5Gbps, Always On USB)	8	Padlock loop
9	PS/2 mouse connector*	10	PS/2 keyboard connector*
11	Ethernet connector	12	E-lock slots
13	Serial connector*	14	Smart cable clip slots
15	PCI-Express card area	16	Power cord connector
17	Security-lock slot		

* for selected models

Serial connector

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

Optional connector

Depending on the computer model, the connector might be a DisplayPort out connector, a USB-C connector, or an HDMI™ out connector.

Related topics

- “Lock the computer” on page 12.
- “Connect an external display” on page 8.
- “USB specifications” on page 5.
- “Smart power-on feature (for selected models)” on page 9

Features and specifications

Specifications	Description
Dimensions	• Width: 170 mm (6.69 inches) • Height: 376 mm (14.8 inches) • Depth: 297.85 mm (11.73 inches)
Weight (without packaging)	Maximum configuration as shipped: 6.5 kg (14.33 lb)
Hardware configuration	1. Open the system menu from the top-right corner and click . 2. Click **System → About**.
Power supply	• 260-watt automatic voltage-sensing power supply • 310-watt automatic voltage-sensing power supply • 400-watt automatic voltage-sensing power supply • 500-watt automatic voltage-sensing power supply

Specifications	Description
Electrical input	• Input voltage: From 100 V ac to 240 V ac • Input frequency: 50/60 Hz
Adaptability for power supply	• Mainland China: 220 V±22 V, 50 Hz±1 Hz • Adaptive voltage positioning: 90 V to 264 V, 50/60 Hz • With voltage selection switch: 90 V to 264 V, 50 Hz±1 Hz
Microprocessor	To view the microprocessor information of your computer: 1. Open the system menu from the top-right corner and click . 2. Click **System → About**.
Memory	Up to four double data rate 5 (DDR5) unbuffered dual inline memory modules (UDIMMs) Maximum memory capacity: 128 GB
Storage device	• 3.5-inch hard disk drive* • M.2 solid-state drive* Type **Disks** in the search box and use the **Disks** application to view the storage drive capacity of your computer. **Note:** The storage drive capacity indicated by the system is less than the nominal capacity.
Video features	• The integrated graphics card supports the following: – DisplayPort out connector – HDMI out connector – VGA-out connector – USB-C connector* • The optional discrete graphics card provides an enhanced video experience and extended capabilities.
Expansion	• Card reader* • Memory slots • M.2 solid-state drive slots • Optical drive* • PCI-Express x1 card slots • PCI-Express x16 Gen 5 graphics card slot • PCI-Express card slot (physical link width x16; negotiable link width x4) • Storage drive cages
Network features	• Bluetooth* • Ethernet LAN • Wireless LAN*

* for selected models

Operating environment

Maximum altitude (without pressurization)

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

Temperature

- Operating: From 5°C (41°F) to 35°C (95°F)
- Storage: From -40°C (-40°F) to 60°C (140°F)

Relative humidity

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

USB specifications

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

Connector name	Description
 • USB-A connector (Hi-Speed USB) • USB-A connector (USB 5Gbps) • USB-A connector (USB 10Gbps)	Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.
 • USB-C connector (USB 20Gbps)	• Charge USB-C compatible devices with the output voltage and current of 5 V and 3 A. • Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to https://www.lenovo.com/accessories.

Chapter 2. Get started with your computer

Connect to power

Connect the computer to a power as shown in the figure below:

1. Connect the power cord to the corresponding connector on the back of the computer case.
2. Plug the other end of the power cable into an electrical outlet.

Notes:

- If your computer has a wireless keyboard and mouse, connect them following the relevant instructions.
- You must use the power adapter provided by Lenovo. The use of another power adapter may cause combustion or explosion.

Start up the computer

Press and hold the power button on the case to start up the computer.

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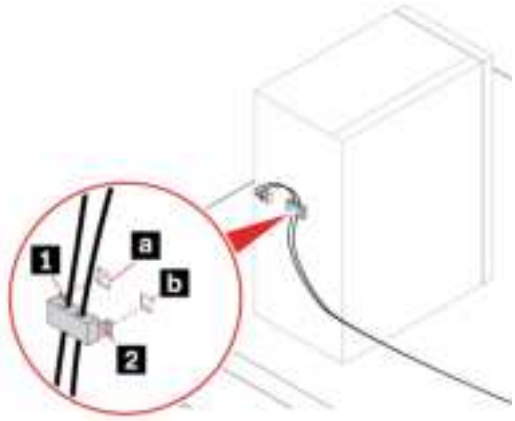
Use a smart cable clip (for selected models)

You can purchase a smart cable clip from Lenovo to lock devices (such as the keyboard and the mouse) to your computer.

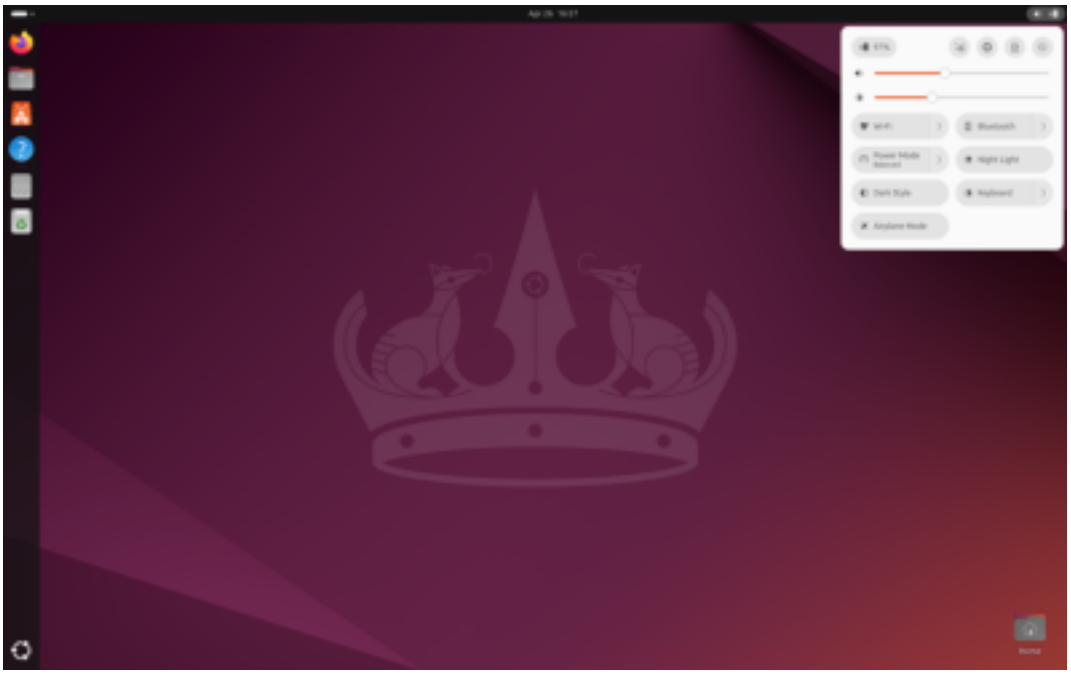
1. Insert the clip 1 into the cable-lock slot a.
2. Pull the cables you want to lock through the dents in the smart cable clip.
3. Press the clip 2 into the cable-lock slot b until it snaps into position.



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/lts/ubuntu-help/index.html.

The Gnome desktop is installed by default and is designed to be simple and easy to use. Details on using Gnome are available by launching the Help application or online at https://help.gnome.org/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 Apps** button on the lower left, and select the application you want to launch.

Launch settings

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

Access networks

This section helps you access networks through connecting to a 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 turn on the Wi-Fi by clicking **Wi-Fi** button.
2. Click **>** to expand the Wi-Fi section of the menu. A list of available wireless networks is displayed. Click **All Networks** to see extra options.
3. Select an available network for connection. Provide required information if needed.

Connect an external display

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

Chapter 3. Explore your computer

Smart power-on feature (for selected models)

The smart power-on feature helps you start up or wake up the computer from the hibernation mode simply by pressing Alt+P.

Note: Ensure that the keyboard is connected to a USB connector supporting the smart power-on feature.

Enable or disable the smart power-on feature

To enable or disable the smart power-on feature:

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

Step 2. Select **Power → Smart Power On** and press Enter.

Step 3. Enable or disable the feature as desired.

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

Set the power plan

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

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

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

To set the power plan:

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

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.

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

Use the optical drive (for selected models)

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

Install or remove a disc

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

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

Record a disc

1. Insert a recordable disc into the optical drive that supports recording.
2. In the **Blank CD/DVD-R Disc** notification that pops up at the bottom of the screen, select **Open with CD/DVD Creator**.
3. Follow the on-screen instructions.

Use a media card (for selected models)

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

Install a media card

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

Remove a media card

Attention: Before removing a media card, unmount the card from the operating system first. Otherwise, data on the card might get corrupted or lost.

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

Purchase accessories

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

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

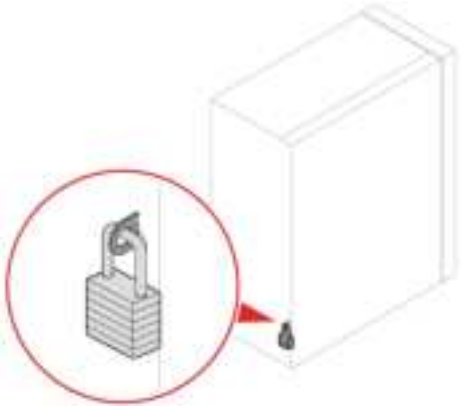
Chapter 4. Secure your computer and information

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.

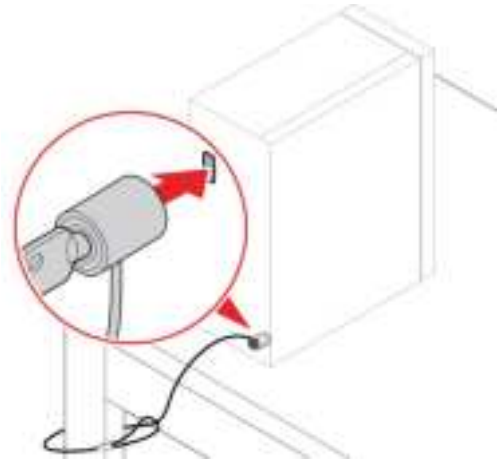
Padlock

Locking the computer cover through a padlock prevents unauthorized access to the inside of your computer.



Security lock

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



E-lock

Your computer might have a security lock solution installed to protect the computer from unauthorized tampering of the internal components. Using the E-Lock, you can mechanically lock or unlock the computer cover.

To enable or disable the E-Lock:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security → Electronic Lock** to enable or disable the E-lock.

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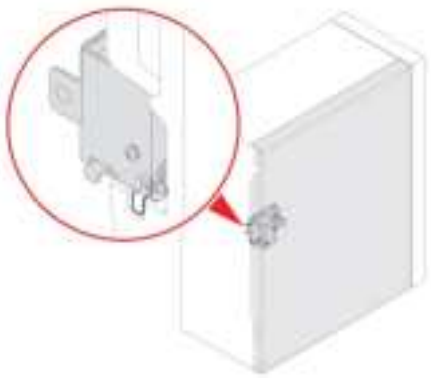
3. Press F10 or Fn+F10 to save the changes and exit. Your computer will restart automatically and then changes take effect.



UEFI BIOS passwords

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

Password types

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

- Power-on password

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

- Supervisor password

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

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

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

- Hard disk password (for selected models)

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

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

- System management password (for selected models)

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

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

3. Follow the on-screen instructions.

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

Set, change, and remove a password

Before you start, print these instructions.

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

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

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

Use BIOS security solutions

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

Wipe the storage drive data (for selected models)

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

To wipe the storage drive data:

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

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

Cover presence switch

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

To enable or disable the cover presence switch 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** or **Disabled** and press Enter.
4. Press F10 or Fn+F10 to save the changes and exit.

If the cover presence switch is enabled and the computer cover is not correctly installed or closed, an error message will be displayed when you turn on the computer. To bypass the error message and log in to the operating system, properly install and close the computer cover, and then enable the cover presence switch connector again in the BIOS menu.

Intel BIOS guard

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

Smart USB Protection

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

- **Disabled** (default setting): You can use the USB storage devices without limitation.
- **Read Only**: You cannot copy data from the computer to the USB storage devices. However, you can access data on the USB storage devices.
- **No Access**: You cannot access the USB storage devices from the computer.

To configure the Smart USB Protection function:

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

Chapter 5. UEFI BIOS

Enter the UEFI BIOS menu

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

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

Navigate the UEFI BIOS menu

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

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

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

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

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

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

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.

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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.

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:
  - For Ubuntu operating system, Ubuntu software update will check the LVFS site for any firmware updates and notify you when updates are available.
  - For IGEL operating system, update, downgrade, or reinstall the UEFI BIOS using the IGEL Universal Management Suite (UMS). See Universal Firmware Update in the IGEL UMS.
- From the Lenovo Support Web site:
  1. Go to https://pcsupport.lenovo.com.
  2. Download the flash BIOS update driver for the operating system version or the ISO image version (used to create a flash update disc). Then, download the installation instructions for the flash BIOS update driver you have downloaded.
  3. Print the installation instructions and follow the instructions to update the BIOS.

Chapter 6. CRU replacement

Important: For users in mainland China, the information provided in this chapter is for reference by professional maintenance service providers or technicians authorized by Lenovo only. Users shall not perform maintenance on their own. Any faults or damage due to improper operation, modification, or failure to use parts provided by Lenovo are not covered by the warranty for this product. For product warranty information, refer to the warranty document provided with the product or go to the official Lenovo website at https://newsupport.lenovo.com.cn.

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

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

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

CRU list

The following is the CRU list of your computer.

Self-service CRUs

- Chassis beam
- Computer cover
- Dust shield*
- Front bezel
- Keyboard*
- M.2 solid-state drive*
- M.2 solid-state drive bracket*
- M.2 solid-state drive heat sink*
- Memory module
- Mouse*
- Optical drive*
- Optical drive bracket*
- ODD and HDD cage
- PCIe bracket
- Power cord

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- Hard disk drive*
- Hard disk drive tray
- 3.5-inch primary hard disk drive cage
- 2.5-inch hard disk drive bracket*
- Slim ODD EMI Shielding*
- Slim ODD latch*
- Slim ODD bezel*
- Smart cable*
- Smart cable clip*
- DP cover kit*
- HDMI new cover*
- Dongle*

Optional-service CRUs

- E-lock*
- Graphics card*
- Graphics card holder*
- PCIe card*
- Power supply assembly

* for selected models

Tool-less storage

You can remove or replace the storage devices of this computer without tools.

Related topics

- “HDD in the primary storage drive cage” on page 26.
- “2.5-inch hard disk drive bracket” on page 30.
- “M.2 solid-state drive and heat sink” on page 32.

Dust shield

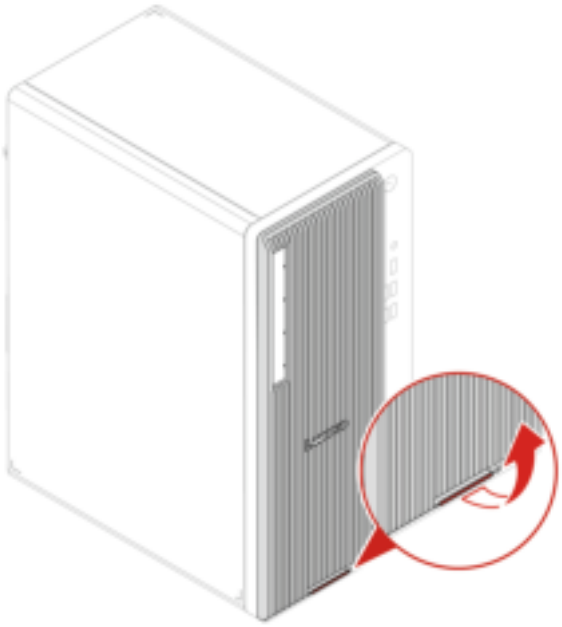
Prerequisite

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.

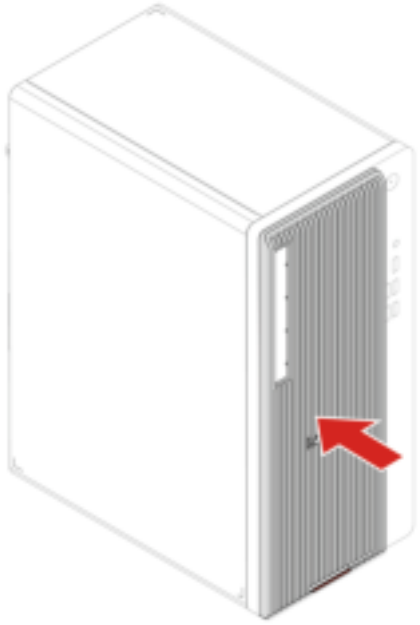
Removal steps

Pull the dust shield out of the front bezel from the bottom side.



Installation steps

Install the new dust shield in reverse order.



Computer cover

Prerequisite

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

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

For access, do the following:

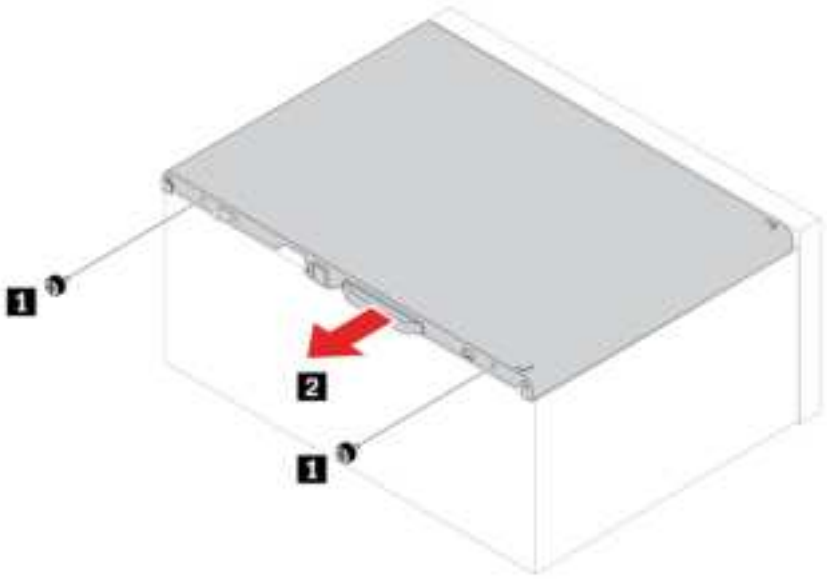
1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the computer cover.
4. Lay down the computer to place the computer cover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

Removal steps

1. Remove the two screws which secure the computer cover to the chassis. Find screw specification in the following screw table.

Screw	Quantity	Torque
M6–32 x L7.5, Ni coated	2	3 ± 0.5 lb/in

2. Remove the computer cover.



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

Front bezel

Prerequisite

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

For access, remove these parts in order, if any:

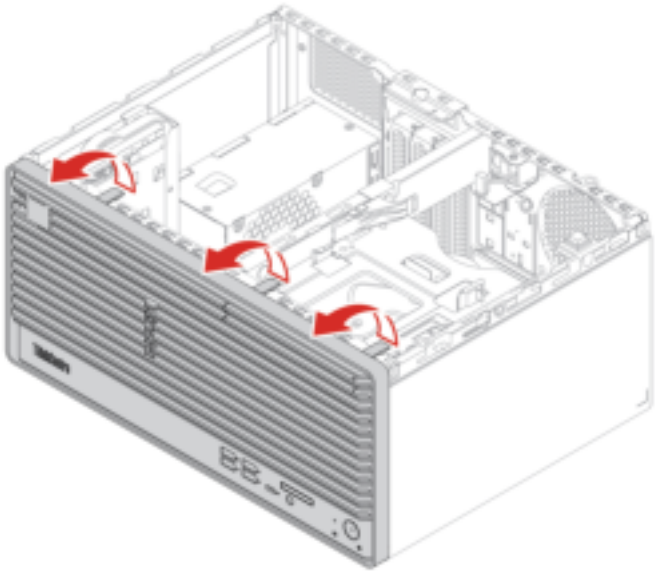
- “Computer cover” on page 20

- “Optical drive and optical drive latch” on page 23

.

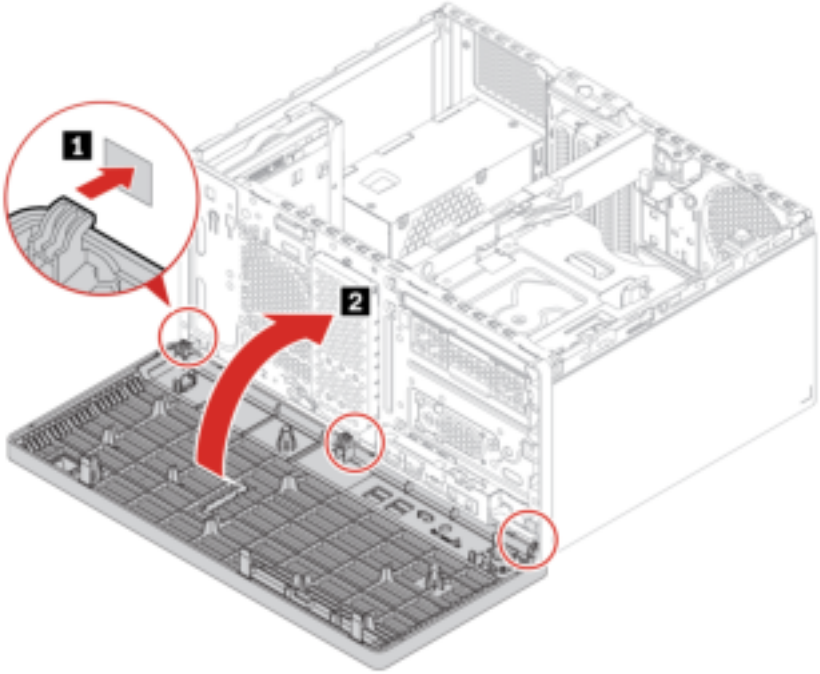
Removal steps

1. Pry the three tabs to release the front bezel.
2. Slightly pull the front bezel to release the hooks of the bezel from the slots on the chassis.



Installation steps

1. Align the three hooks on the bottom of the front bezel with the slots on the chassis.
2. Pivot the bezel inwards until the tabs on the top of the bezel are clicked into place.



Optical drive and optical drive latch

Prerequisite

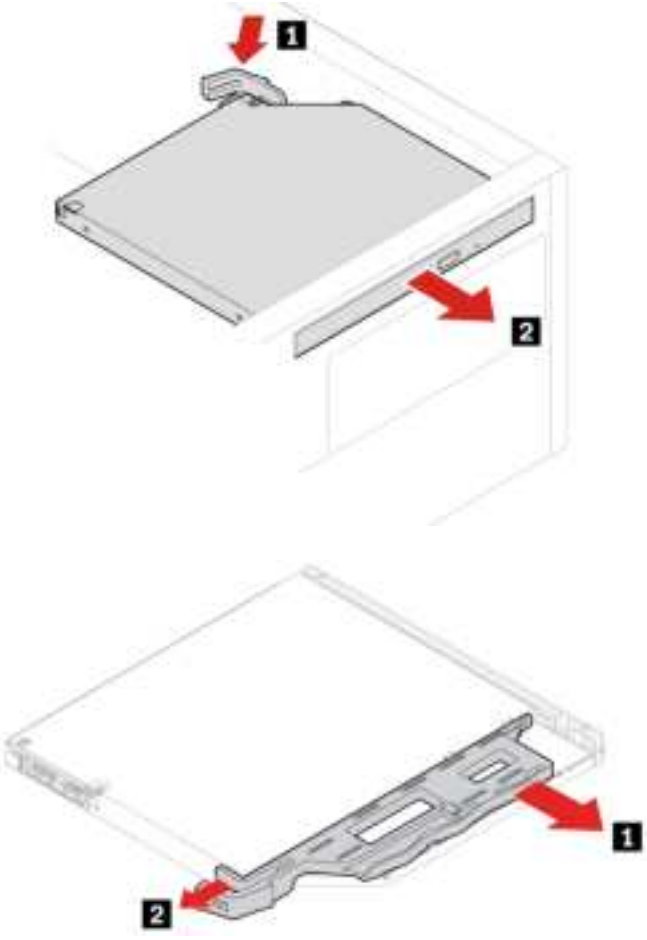
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the “Computer cover” on page 20.
2. Disconnect the signal and power cable from the optical drive.

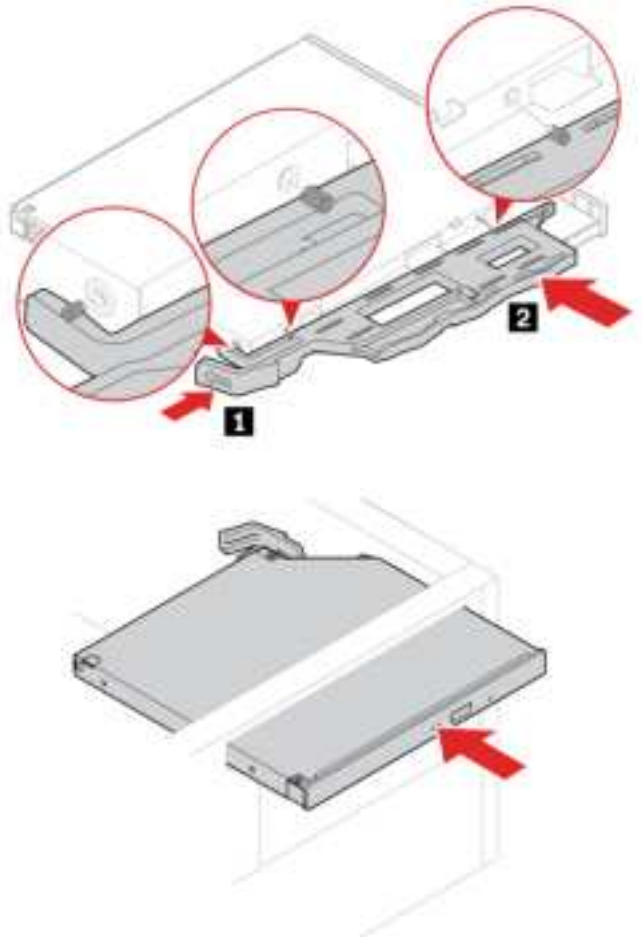
Removal steps

1. Press the optical drive latch and push the optical drive out of the disk drive cage.
2. Pull the optical drive latch out of the optical drive.



Installation steps

1. Align the latch studs with the holes in the optical drive.
2. Install the optical drive to the drive cage.



Optical drive bezel

Prerequisite

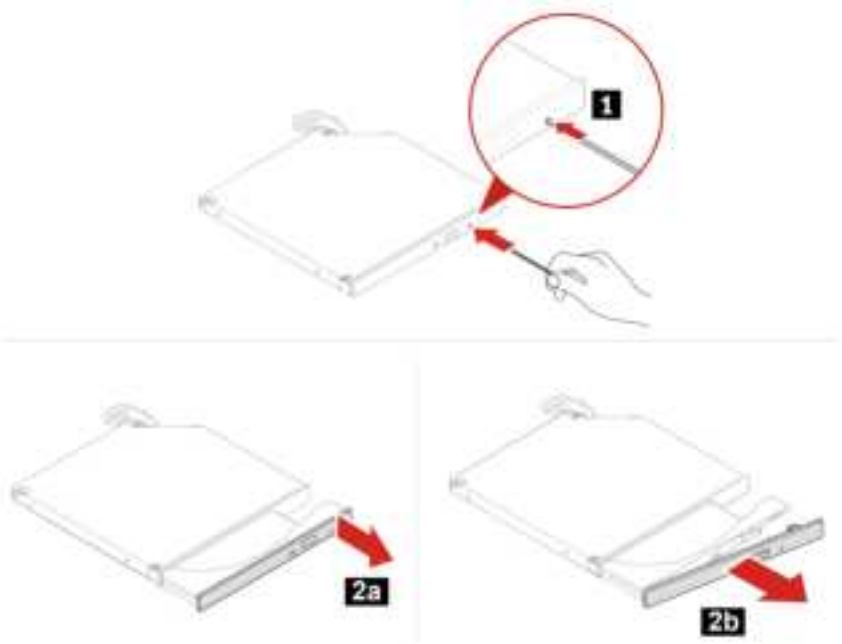
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the “Computer cover” on page 20.
2. Remove the “Optical drive and optical drive latch” on page 23.
3. Disconnect the signal and power cable from the optical drive.

Removal steps

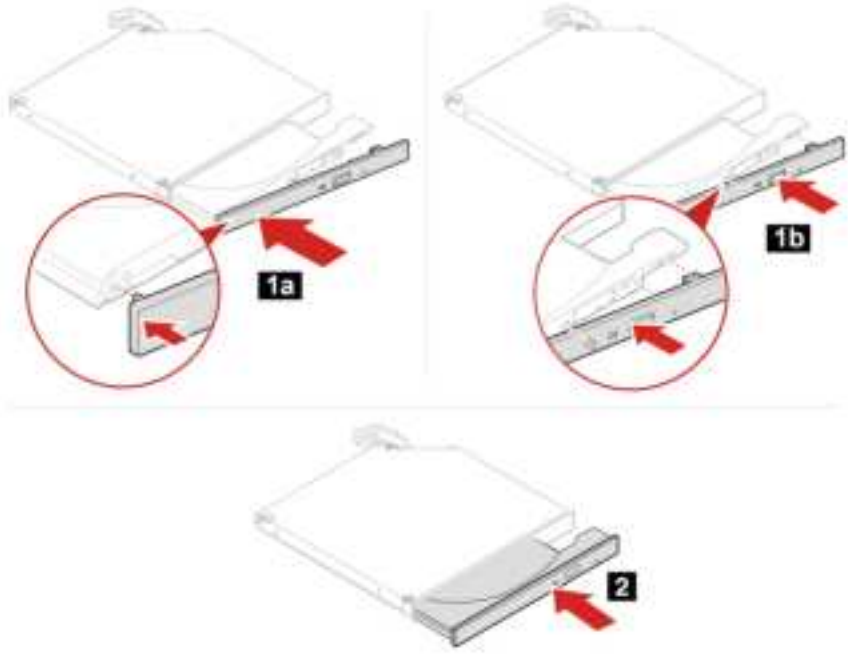
1. Use an ejector like paper clip to eject the optical drive tray.
2. Remove the optical drive bezel from the optical drive.



Installation steps

There are four holes on the optical drive tray to locate the optical drive bezel.

1. Install the optical drive bezel to the optical drive tray, and make sure that it is inserted into these holes.
2. Install the optical drive tray back to the optical drive.



Slim ODD EMI shielding

Prerequisite

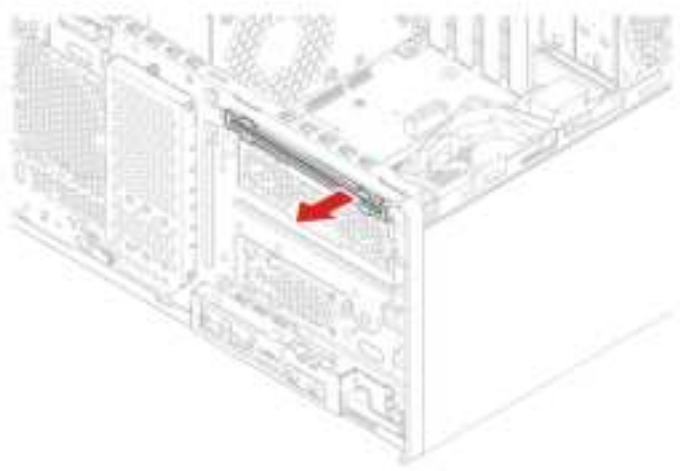
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the “Computer cover” on page 20.
2. Remove the “Front bezel” on page 21

Removal steps

Push the slim ODD EMI shielding outwards to remove it.



HDD in the primary storage drive cage

Prerequisite

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

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

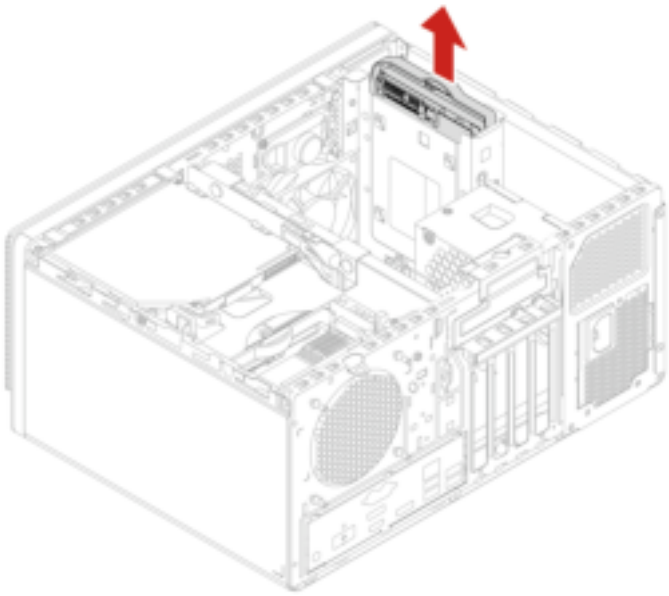
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

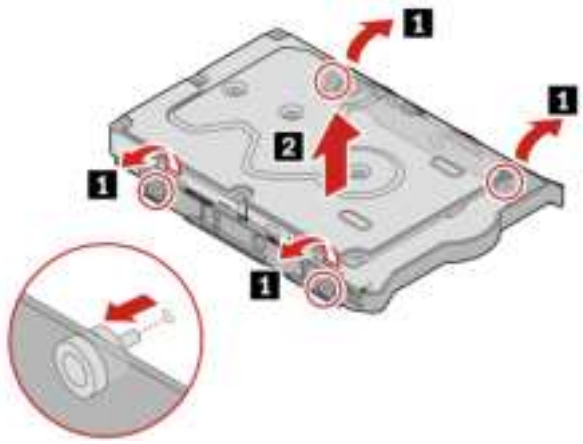
Remove these parts in order, if any:

1. Remove the “Computer cover” on page 20.
2. Disconnect the signal cable and the power cable from the hard disk drive.

Removal steps

1. Pull the hard disk drive and its drive tray from the primary storage drive cage.
2. Release the hard disk drive from its tray.





Primary hard disk drive cage

Prerequisite

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

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

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

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

For access, remove these parts in order, if any:

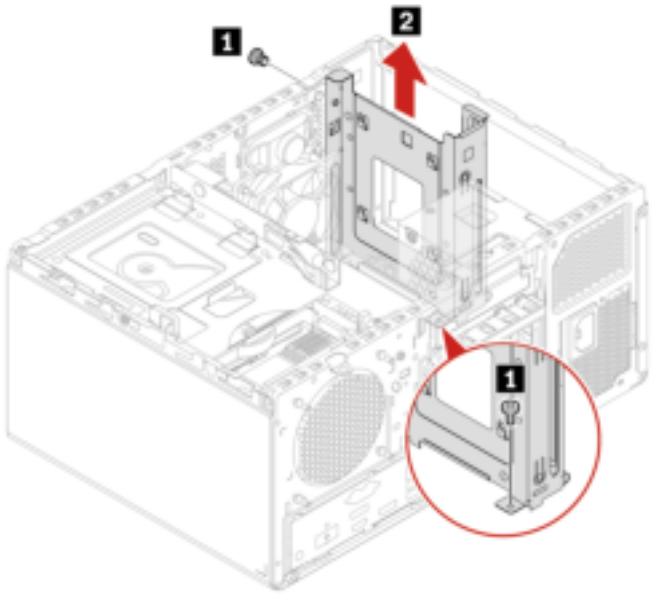
- “Computer cover” on page 20
- “Optical drive and optical drive latch” on page 23
- “Front bezel” on page 21
- “HDD in the primary storage drive cage” on page 26

Removal steps

1. Remove the two screws which secure the primary hard disk drive cage to the chassis. Find screw specification in the following table.

Screw	Quantity	Torque
M6–32 x L8 mm, Hex Head	2	5.0 ± 0.5 lb/in

2. Remove the primary hard disk drive cage.



ODD and HDD cage

Prerequisite

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

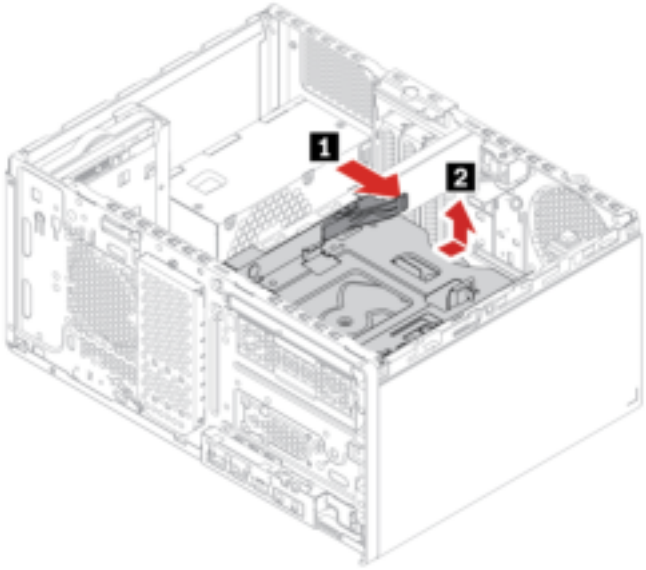
For access, do the following:

1. Remove these parts in order, if any:
   - “Computer cover” on page 20
   - “Optical drive and optical drive latch” on page 23
   - “Front bezel” on page 21

2. Disconnect the signal cable and power cable (if any) from the secondary hard disk drive under the optical drive cage.

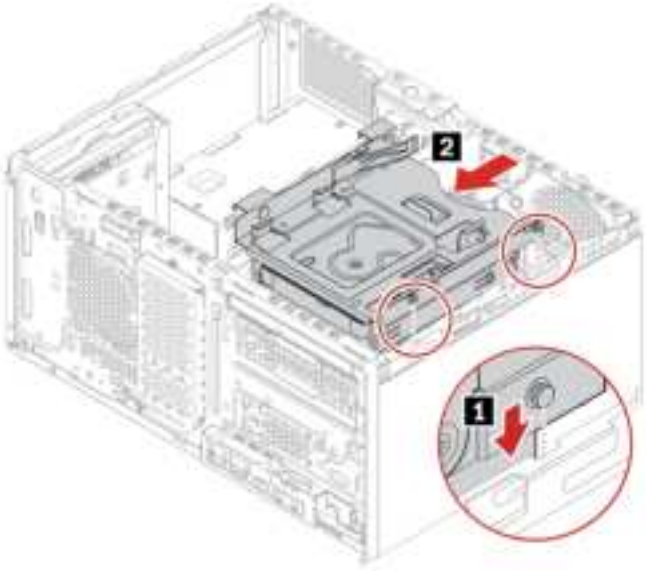
Removal steps

Press the ODD and HDD cage tab and lift the cage upwards.



Installation steps

1. Align the buckles on the ODD and HDD cage with the slots on the chassis.
2. Slide the ODD and HDD cage towards the front panel until it's clicked into place.



2.5-inch hard disk drive bracket

Prerequisite

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

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

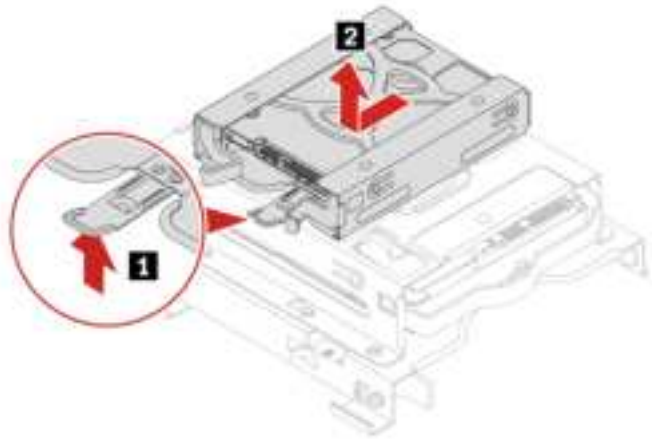
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

For access, remove these parts in order, if any:

- “Computer cover” on page 20
- “Optical drive and optical drive latch” on page 23
- “Front bezel” on page 21
- Disconnect the signal cable and the power cable from the hard disk drive.

Removal steps

Pull the tab on the 2.5-inch hard disk drive bracket and lift the bracket.



Hard disk drive in the ODD and HDD cage

Prerequisite

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

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

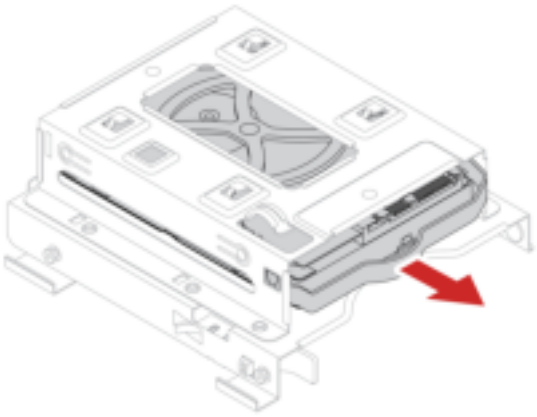
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

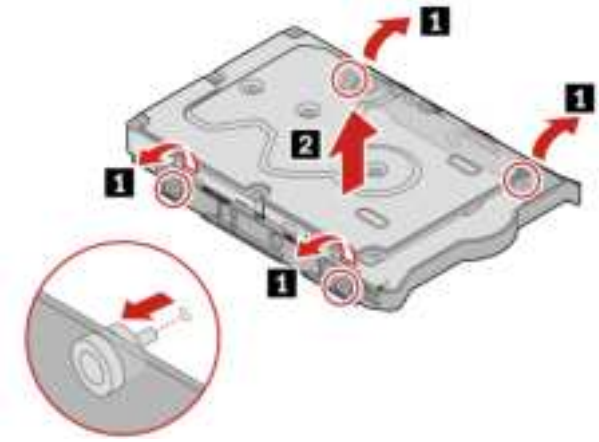
For access, do the following:

1. Remove these parts in order, if any:
   - “Computer cover” on page 20
   - “Optical drive and optical drive latch” on page 23
   - “Front bezel” on page 21
2. Disconnect the signal cable and the power cable from the hard disk drive.

Removal steps

1. Pull the hard disk drive and its drive tray from the ODD and HDD cage.
2. Release the hard disk drive from its tray.





M.2 solid-state drive and heat sink

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.

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

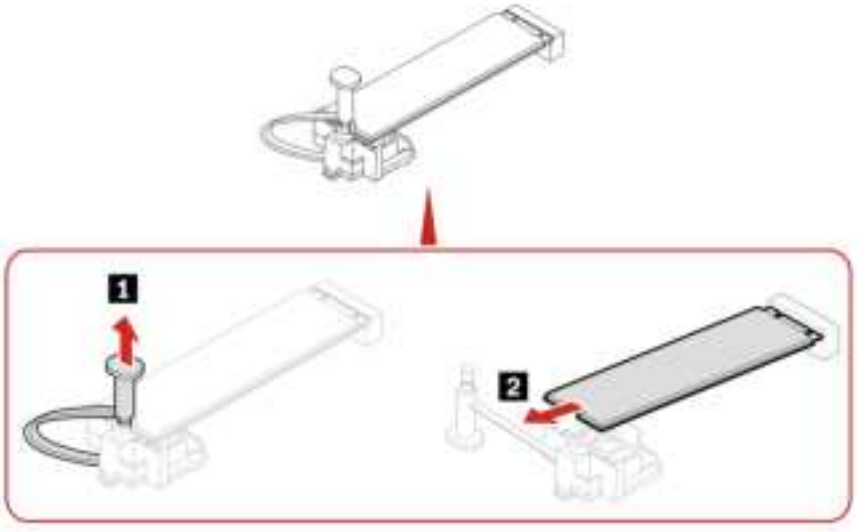
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

For access, remove the “Computer cover” on page 20.

Removal steps for Type-1 M.2 solid-state drive

For computers without the heat sink for the M.2 solid-state drive, release the M.2 solid-state drive from the system board by pulling the SSD clip out of its holder.

Note: Remove the film that covers the thermal pad (if any) when installing the M.2 solid-state drive and the heat sink.

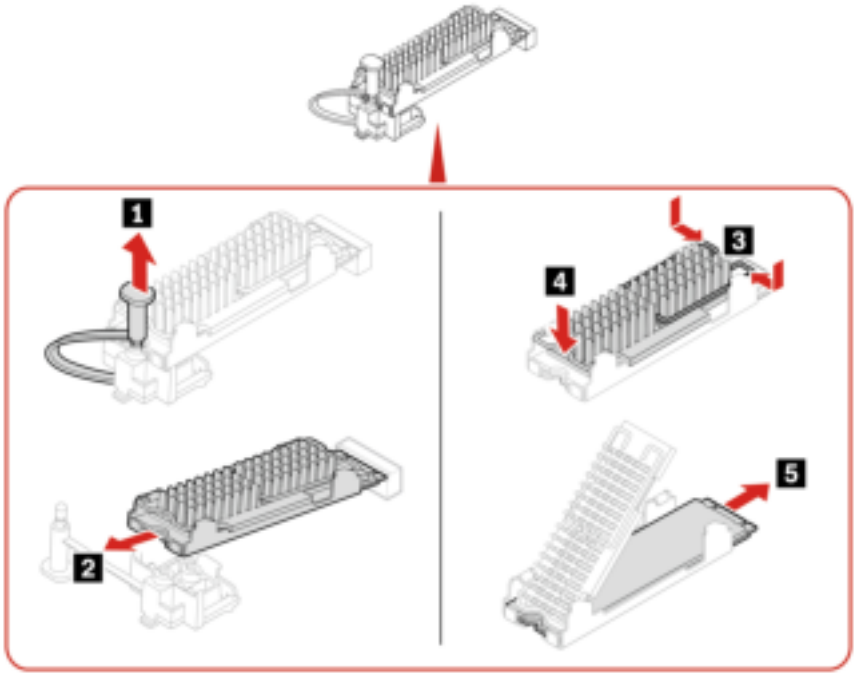


Removal steps for Type-2 M.2 solid-state drive

The type-2 M.2 solid-state drive is installed in its heat sink. To remove Type-2 M.2 solid-state drive, take following steps:

1. Release the heat sink from the system board by pulling the SSD clip out of its holder.
2. Remove the heat sink.
3. Pinch the two latches on top of the heat sink.
4. Press the other end of the heat sink downward.
5. Remove the M.2 solid-state drive and thermal pad (if any).

Note: Remove the film that covers the thermal pad (if any) when installing the M.2 solid-state drive, heat sink, and thermal pad.

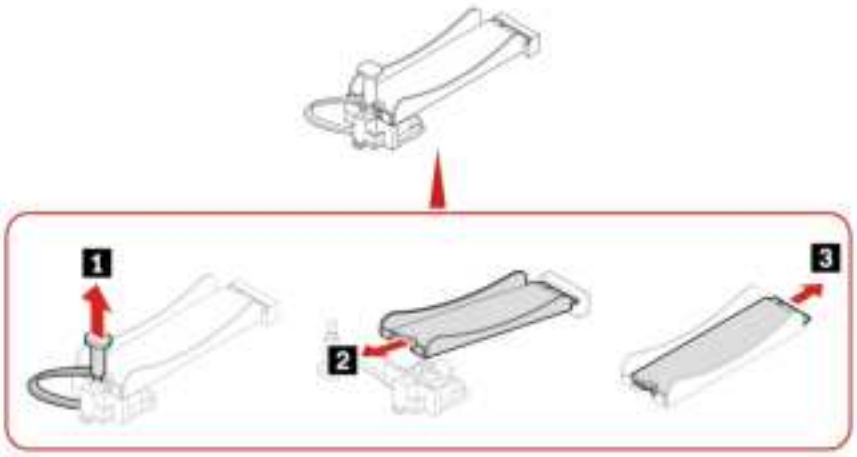


Removal steps for Type-3 M.2 solid-state drive

The type-3 M.2 solid-state drive is installed in its heat sink. To remove Type-3 M.2 solid-state drive, take following steps:

1. Release the heat sink from the system board by pulling the SSD clip out of its holder.
2. Remove the heat sink.
3. Remove the M.2 solid-state drive and thermal pad (if any).

Note: Remove the film that covers the thermal pad (if any) when installing the M.2 solid-state drive and the heat sink.



M.2 solid-state drive bracket

Prerequisite

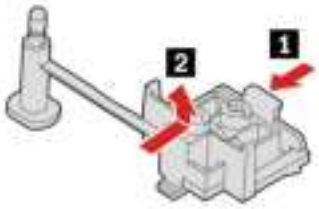
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove these parts in order, if any:

- “Computer cover” on page 20
- “M.2 solid-state drive and heat sink” on page 32

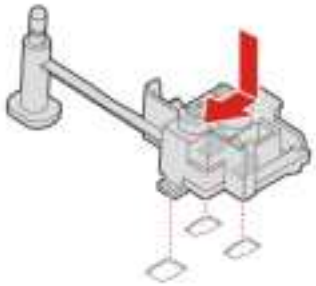
Removal steps

Release the M.2 solid-state drive bracket from chassis by pushing its retaining clip toward the chassis.



Installation steps

Align the M.2 solid-state drive bracket with the three holes on the chassis.



PCIe card

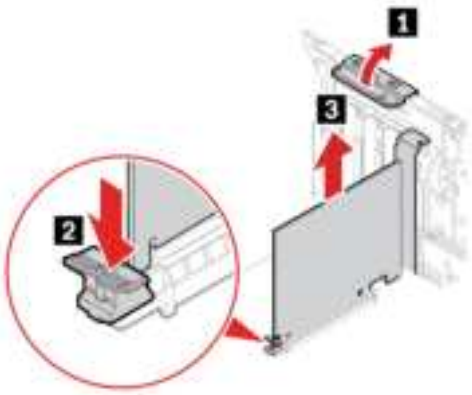
Prerequisite

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

For access, remove the “Computer cover” on page 20.

Removal steps

1. Open the PCIe latch.
2. Press the securing tab and lift the PCIe card out of the slot.



Note: Do not attempt to install any PCI-Express cards other than graphics card to the PCI-Express slot next to the microprocessor.

Graphics card holder

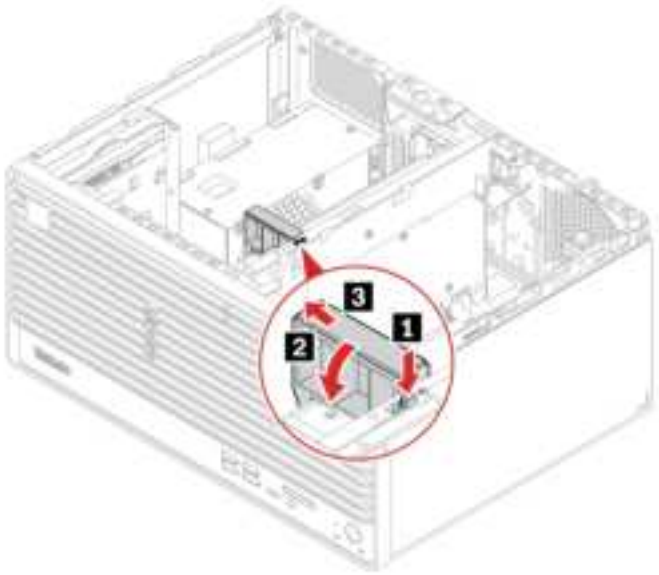
Prerequisite

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

For access, remove the “Computer cover” on page 20.

Removal steps

1. Press the securing tab to release the holder.
2. Pivot the holder horizontally and remove it from the chassis beam.



Graphics card

Prerequisite

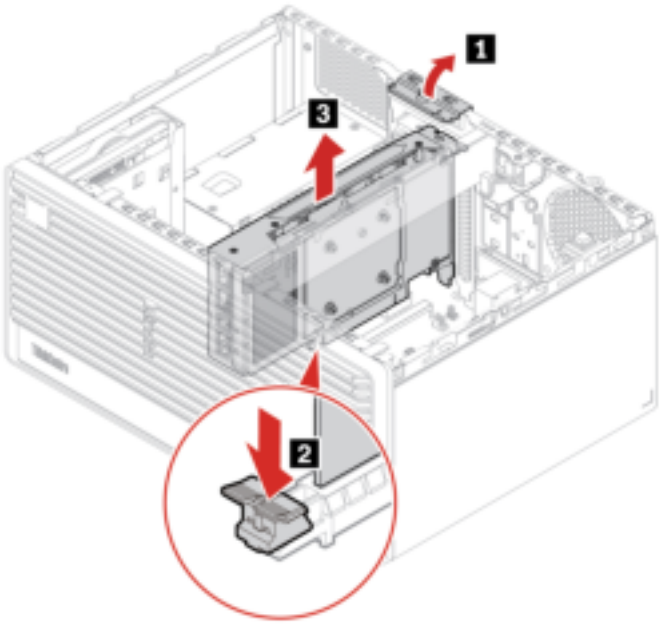
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove these parts in order, if any:
   - “Computer cover” on page 20
   - “Optical drive and optical drive latch” on page 23
   - “ODD and HDD cage” on page 28
   - “Graphics card holder” on page 35
2. Disconnect the power cable from the graphics card.

Removal steps

1. Open the PCIe latch.
2. Press the securing tab and lift the graphics card out of the slot.



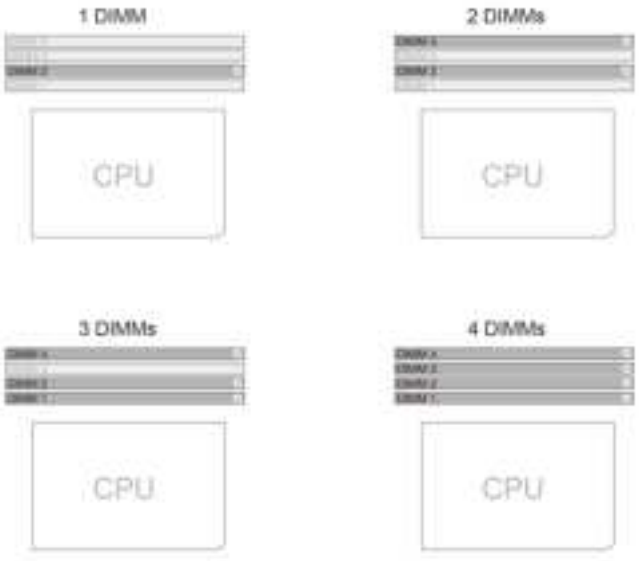
Note: Do not attempt to install any PCIe cards other than graphics card to the PCI-Express slot next to the microprocessor.

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.

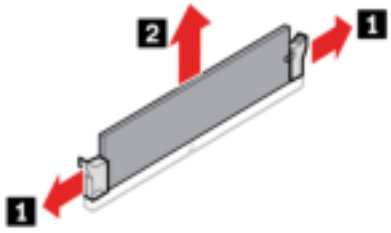


For access, remove these parts in order, if any:

- “Computer cover” on page 20
- “Optical drive and optical drive latch” on page 23
- “ODD and HDD cage” on page 28
- “Graphics card holder” on page 35

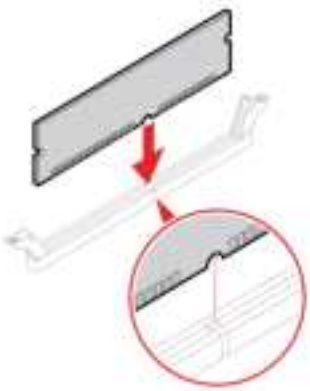
Removal steps

1. Open the two retaining tabs.
2. Lift the memory module out of the slot.



Installation steps

Align the memory module to the slot and press down on both ends until the latches are fully engaged with a click.



Power supply assembly

Prerequisite

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

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

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

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

For access, do the following:

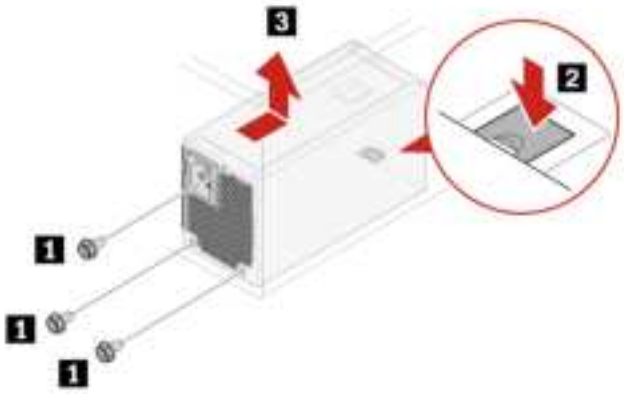
1. Remove these parts in order, if any:
   - “Computer cover” on page 20
   - “Optical drive and optical drive latch” on page 23
   - “Front bezel” on page 21
   - “HDD in the primary storage drive cage” on page 26
   - “Primary hard disk drive cage” on page 27
2. Disconnect the power supply assembly cables from the system board.

Removal steps

1. Remove the three screws which secure the power supply assembly to the chassis. Find screw specification in the following screw table.

Screw	Quantity	Torque
M6–32 x L8, Hex Head	3	5 ± 0.5 lb/in

2. Press the retaining tab.
3. Push the power supply assembly inwards and lift it.



E-lock

Prerequisite

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

For access, do the following:

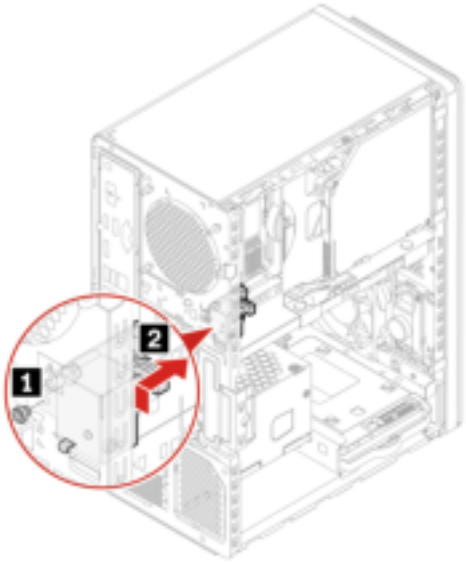
1. Remove the “Computer cover” on page 20.
2. Disconnect the E-lock cable from the system board.

Removal steps

1. Use a special tool (T15 star wrench) to remove the screw which secures the E-lock to the chassis. Find screw specification like torque in the following screw table.

Screw	Quantity	Torque
M3 x L5-T15	1	5 ± 0.5 lb/in

2. Pull the E-lock away from the chassis.



Chassis beam

Prerequisite

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

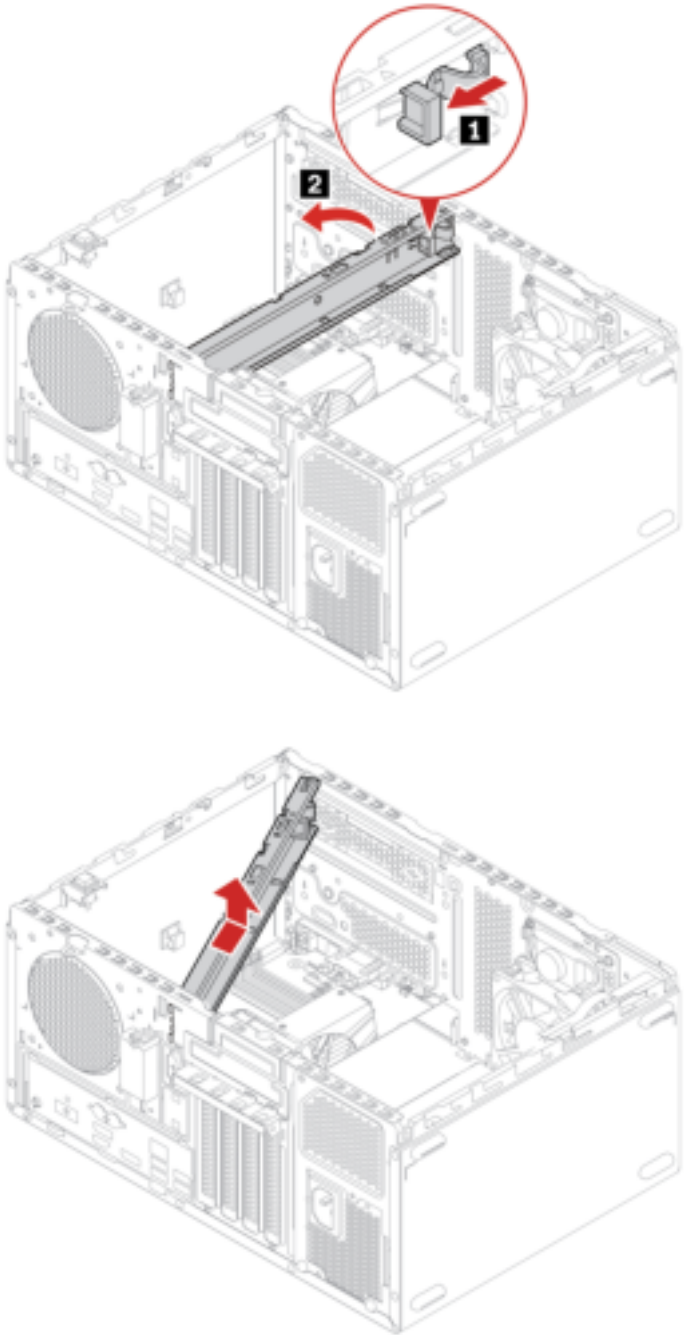
For access, remove these parts in order if any:

- “Computer cover” on page 20
- “Optical drive and optical drive latch” on page 23
- “Front bezel” on page 21
- “ODD and HDD cage” on page 28
- “Graphics card holder” on page 35
- “Graphics card” on page 36

Removal steps

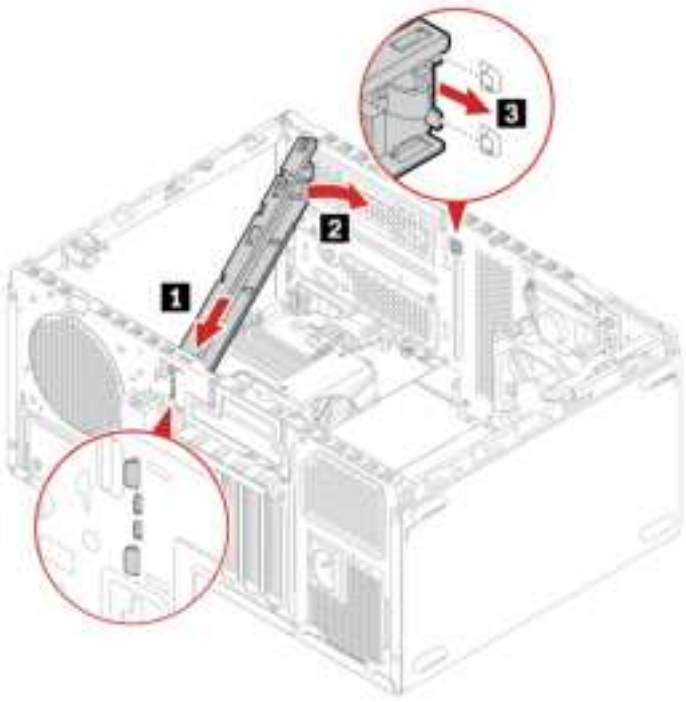
1. Press the tab to release one side of the chassis beam from the chassis.

2. Pivot the chassis beam until the hooks on the other side are completely released from the holes on the chassis.



Installation steps

1. Align the hooks of the chassis beam on the one side with the holes on the rear panel of chassis.
2. Pivot the chassis beam until the hooks of the other side are clicked into the front panel of the chassis .


3
2
1

Chapter 7. Help and support

Self-help resources

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

Resources	How to access?
Product documentation: • *Safety and Warranty Guide* • *Generic Safety and Compliance Notices* • *Setup Guide* • This *User Guide* • *Regulatory Notice*	Go to https://support.lenovo.com/documentation and search by product.
Lenovo Support Web site with the latest support information of the following: • Drivers and software • Diagnostic solutions • Product and service warranty • Product and parts details • Knowledge base and frequently asked questions	https://pcsupport.lenovo.com
Ubuntu help information	https://help.ubuntu.com/lts/ubuntu-help/index.html
IGEL support information	https://support.igel.com/

Lenovo diagnostic tools

For information about Lenovo diagnostic tools, go to:
https://pcsupport.lenovo.com/lenovodiagnosticsolutions

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Call Lenovo

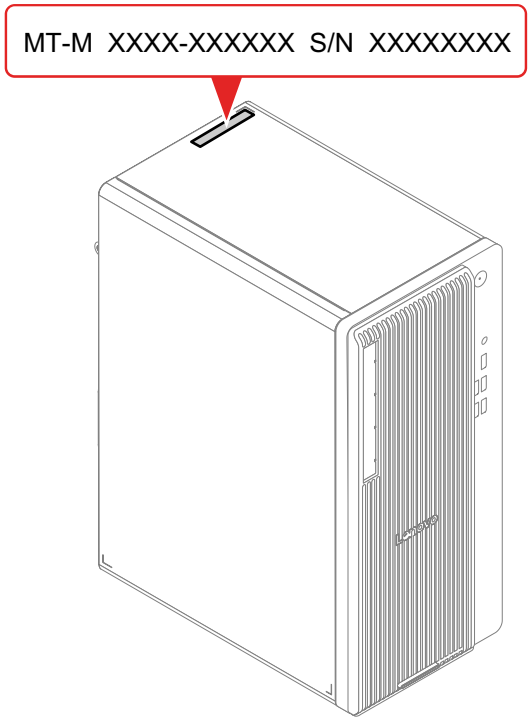
If you have tried to correct the problem yourself and still need help, you can call Lenovo Customer Support Center.

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/supportphonelist

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

Services available during the warranty period

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

Services not covered

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

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

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.

Accessibility features

Lenovo is committed to making information technology accessible to everyone, including those with hearing, vision, or mobility limitations. Lenovo supports accessibility features in the following ways to help all users better engage with Lenovo products.

Accessible documentation

Lenovo documentation is designed to meet users' accessibility needs. Users can read the documentation with assistance as needed. For example:

- Text and images are in high contrast. Color contrast can enhance the visual experience. In this mode, all contents are highlighted to be more visible.
- Text is logical and readable. Images are also readable with alternative text provided. A screen reader can enhance the hearing or listening experience. In this mode, all contents are clearer and easier to understand.
- Text is large and clear, making it easier to read. A magnifier can enlarge the text to improve readability.

For more information, watch the video at:
https://support.lenovo.com/docs/pc_pub_accessibility

Accessible product design

Lenovo product design also supports accessibility features.

Note: The accessibility features vary by product. Depending on the product model, some accessibility features listed below might not be applicable to the product. To get the most up-to-date accessibility information for the product, go to https://www.lenovo.com/accessibility. For additional support from Lenovo, users can find phone numbers for their country or region from https://support.lenovo.com/supportphonelist.

- **Keyboards**

  Lenovo keyboards support various accessibility features. For example:

  - Consistent layout of keyboards for easier use
  - Tactile markings on some keys for easier identification
  - Appropriate spacing between keys for typing efficiency
  - Sufficient contrast of keys, controls, and labels for better visibility
  - On-screen notification or lighted notification for some keys for ease of use
  - Keys and controls that can be reached and operated using one hand and require minimal dexterity for ease of use

- **Industry-standard connectors**

  The industry-standard connectors on Lenovo products enable better compatibility with peripheral devices.

- **Operating systems**

  The accessibility features of the operating systems can be configured to assist users in the following ways:

  - Vision features make the screen contents easier to see.
  - Hearing features make the screen contents easier to hear.
  - Interaction features make the product easier to control.

  To access the accessibility features of the Ubuntu or Fedora operating system, go to **Settings** → **Accessibility**.

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

Access Linux distributions

To learn more about the IGEL operating system, go to https://www.igel.com/support.

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

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

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

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

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

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Appendix B. Notice for USB connector name update

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

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

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  https://newsupport.lenovo.com.cn
- For computers purchased outside mainland China
  https://pcsupport.lenovo.com

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