User Guide

Lenovo
ThinkCentre

ThinkCentre M70a/M90a Gen 6

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 M70a Gen 6	13AY, 13B0, 13B1, 13B2, 13B3
ThinkCentre M90a Gen 6	13AT, 13AU, 13AV, 13AW, 13AX

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:

- For more compliance information on computers purchased outside mainland China, see *Regulatory Notice* at https://support.lenovo.com/docs/common_commercial_rn or go to 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
- Microsoft® makes periodic feature changes to the Windows® operating system through Windows Update. As a result, some information in this documentation might become outdated. Refer to Microsoft resources for the latest information.

Contents

Chapter 1. Meet your computer

Front

Item	Description	Item	Description
1	Radar card* (for ThinkCentre M90a Gen 6 only)	2	Microphones*
3	Camera activity indicator*	4	Camera shutter*
5	Camera*	6	Screen (touch-enabled for selected models)
7	Microphone mute/unmute indicator*	8	Power indicator

* for selected models

Camera

The camera for some models includes an infrared (IR) LED to emit and detect near-infrared waves. They are used together to achieve face-based authentication.

Microphone mute/unmute indicator

The indicator is on when microphones are muted.

Power indicator

Show the system status of your computer.

- **Blinking for three times:** The computer is initially connected to power.
- **On:** The computer is starting up or working.
- **Off:** The computer is off or in hibernation mode.
- **Blinking rapidly:** The computer is entering sleep or hibernation mode.

- **Blinking slowly:** The computer is in sleep mode.

Related topics

- "Camera shutter (for selected models)" on page 24
- "Face authentication (for selected models)" on page 22
- "Use the touch screen (for selected models)" on page 19

Right
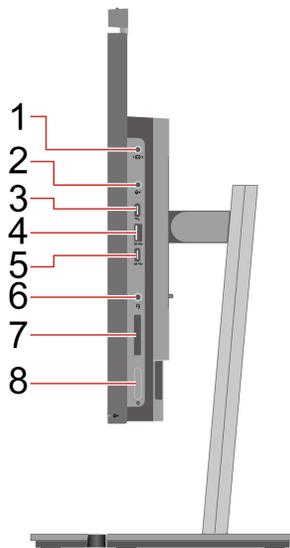
Item	Description	Item	Description
1	PC/monitor mode switch	2	Microphone mute/unmute switch*
3	USB-C® (Thunderbolt™ 4) connector (for ThinkCentre M90a Gen 6 only)	4	USB-A connector (USB 10Gbps)
5	USB-C connector (USB 10Gbps)	6	Headset connector
7	SD™ card slot*	8	Power button

* for selected models

Note: For more information about the USB connector name update, see Appendix A "Notice for USB connector name update" on page 47.

Statement on USB transfer rate

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

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

Microphone mute/unmute switch

Depending on the device mode, the microphone mute/unmute switch has different functions.

Mode	Function of the microphone mute/unmute switch
PC mode	Press it to mute or unmute the microphones.
Monitor mode	Press or long-press it to adjust the screen brightness.

Related topics

- "USB specifications" on page 6
- "Transfer data" on page 22
- "Start up the computer" on page 9
- "Shut down the computer" on page 10

Rear
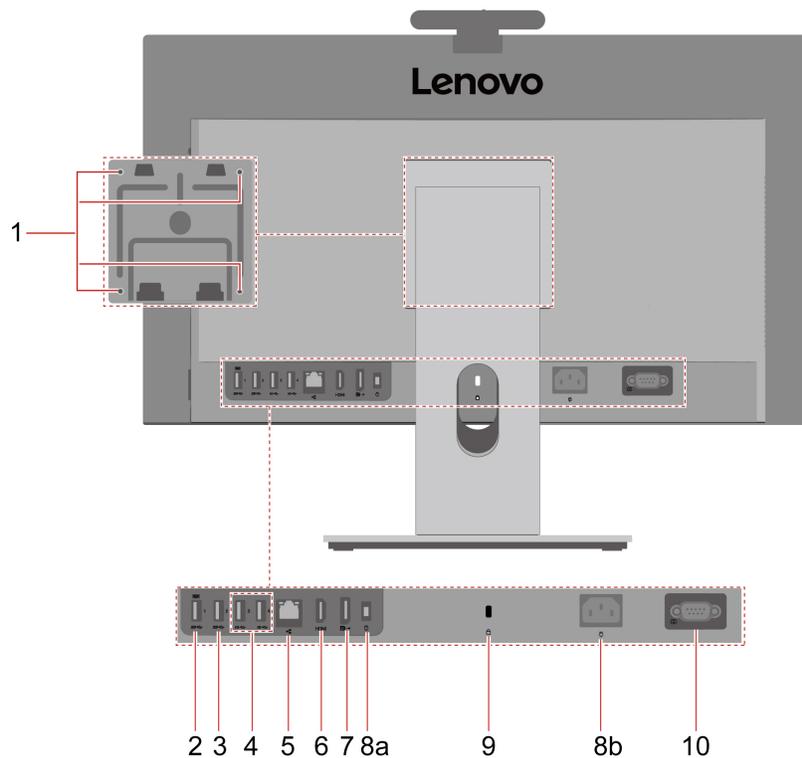
Item	Description	Item	Description
1	VESA thread holes* (screws: M4 x 8 mm, 4 pcs)	2	USB-A connector (USB 5Gbps) with smart power-on feature
3	USB-A connector (USB 5Gbps)	4	USB-A connectors (USB 10Gbps)
5	Ethernet connector (1G)	6	HDMI™ in 1.4/out 2.1 TMDS combo connector
7	DisplayPort™ out connector	8a	Power connector (for ThinkCentre M70a Gen 6 only)
8b	Power connector (for ThinkCentre M90a Gen 6 only)	9	Security-lock slot
10	Serial connector*		

* for selected models

VESA thread holes

When mounting the computer on a VESA mount, position the computer monitor either horizontally (with the screen facing forward and the side I/O ports facing right) or vertically (with the screen facing forward and the side I/O ports facing down).

Smart power-on feature

When your keyboard is connected to the USB connector supporting the smart power-on feature, you can start up or wake up the computer from hibernation mode simply by pressing Alt+P.

To enable or disable the smart power-on feature:

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

HDMI in 1.4/out 2.1 TMDS combo connector

This connector will work 10 seconds after connection as an HDMI in or an HDMI out connector, depending on whether the connected device is a computer or a monitor.

Serial connector

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

Related topics

- "USB specifications" on page 6
- "Access networks" on page 10
- "Connect to external displays" on page 13
- "Start up the computer" on page 9
- "Security lock" on page 24

Specifications

Specification	Description
Dimensions	• Width: 539.6 mm (21.2 inches) • Height: 314.7 mm (12.4 inches) • Depth: 49.55 mm (1.95 inches)
Weight (without packaging)	Maximum configuration as shipped: • ThinkCentre M70a Gen 6: 8.08 kg (17.81 lb) • ThinkCentre M90a Gen 6: 8.96 kg (19.75 lb)
Hardware configuration	Type `Device Manager` in the Windows search box and then press Enter. Type the administrator password or provide confirmation, if prompted.

Power supply	• ThinkCentre M70a Gen 6: 90-watt automatic voltage-sensing power supply
	• ThinkCentre M90a Gen 6:
	  – 180-watt automatic voltage-sensing power supply*
	  – 230-watt automatic voltage-sensing power supply*

Electrical input	• Input voltage: From 100 V ac to 240 V ac • Input frequency: 50/60 Hz
Memory	• Memory type: Double data rate 5 (DDR5) small outline dual in-line memory module (SODIMM) • Maximum memory capacity: 64 GB
Storage device	M.2 solid-state drive (SSD) To view the storage drive capacity of your computer, type `Disk Management` in the Windows search box and then press Enter. **Note:** The storage drive capacity indicated by the system is less than the nominal capacity.

Video features	• Brightness control
	• Color display with Thin Film Transistor (TFT), In-Plane Switching (IPS), and White Light Emitting Diode (WLED) technologies
	• Display size: 604.5 mm (23.8 inches)
	• Display resolution: 1920 x 1080 pixels
	• Multi-touch technology*
	• Maximum output resolutions:
	  – DisplayPort out connector: 5K/60 Hz
	  – HDMI out connector: 4K/60 Hz
	  – USB-C connector (Thunderbolt 4)*: 8K/30 Hz
	
	  Note: The actual resolution of external displays may vary by the connected display device and the cable being used.
	• The optional discrete graphics card provides an enhanced video experience and extended capabilities.

Specification	Description
Expansion	• SD card reader* (Support SD, SDHC™, and SDXC™) • Memory slots • M.2 SSD slots • External optical disc drive (ODD) box*
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

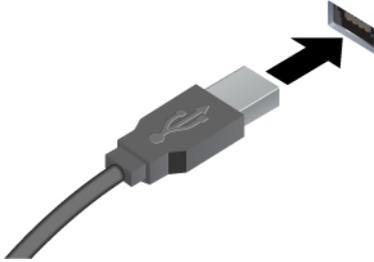- Operating: From 5°C (41°F) to 35°C (95°F)
- Storage:
  - For common desktop computers: From -40°C (-40°F) to 60°C (140°F)
  - For all-in-one desktop computers: From -20°C (-4°F) to 60°C (140°F)

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

Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.

- **SS⟵** USB-A connector (USB 5Gbps)
- **10⟵** USB-A connector (USB 10Gbps)
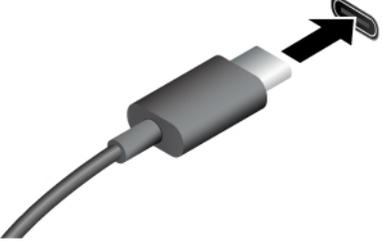
- USB-C connector (USB 10Gbps)
  - Maximum power output: 15 W (5 V, 3 A)
- USB-C connector (Thunderbolt 4)
  - Supported power output: 65 W (20 V, 3.25 A) or 15 W (5 V, 3 A)
  - Thunderbolt 4 to DP 2.1: 7680 x 4320 pixels, 30 Hz
- Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to https://www.lenovo.com/accessories.

- **10⟵** USB-C connector (USB 10Gbps)
- **⚡** USB-C connector (Thunderbolt 4)

The Vantage app

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

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

Notes:

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

The Vantage app enables you to:

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

Chapter 2. Get started with your computer

Carry the computer
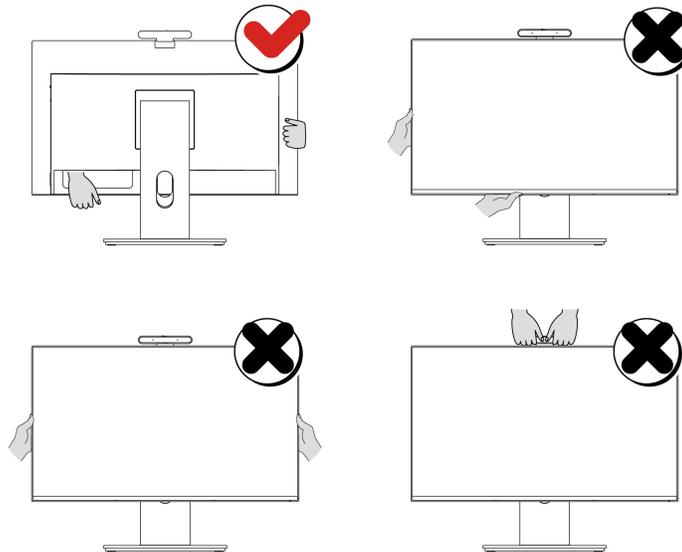
Notes:

- Hold the computer firmly while carrying it.
- Keep the computer upright.

Start up the computer

ThinkCentre M70a Gen 6 | ThinkCentre M90a Gen 6
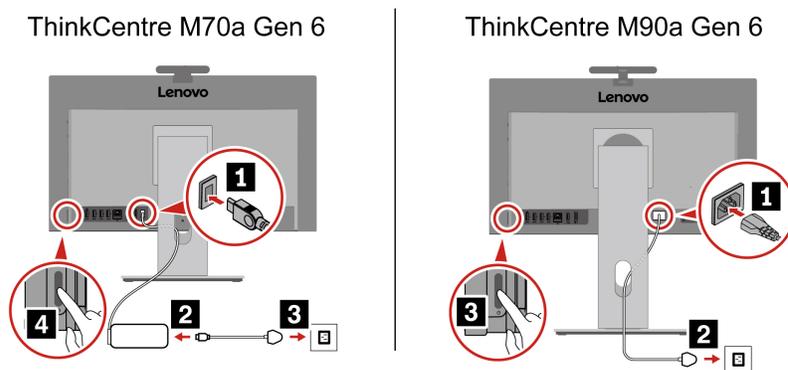
Step 1. Connect the power cord to the power connector on the back of the computer.

Step 2. Connect the power cord to the ac power adapter (for ThinkCentre M70a Gen 6 only).

Step 3. Insert the power plug into a properly grounded electrical outlet.

Step 4. Press the power button on the computer's lower right to start up the computer.

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.

Shut down the computer

To prevent damage to hardware/software systems or loss of data, do not arbitrarily use the power button to shut down the computer. Instead, shut down the computer as follows.

Step 1. Click ■ → ⏻ → ⏻ **Shut down**.

Step 2. Wait for the computer to shut down and then turn off the monitor and other peripheral devices.

Note: After you turn off the system, please wait at least 20 seconds before turning the computer back on to avoid hardware faults.

Access networks

This section helps you connect to a wireless or wired network.

Connect to Wi-Fi networks (for selected models)

Click the network icon ⊕ on the bottom right of your display to connect to an available network. Provide required information, if needed.

Note: The wireless LAN module on your computer may support different standards. For some countries or regions, the use of 802.11ax and 802.11be may be disabled according to local regulations.

Connect to the wired Ethernet

Connect your computer to a local network through the Ethernet connector on your computer with an Ethernet cable.
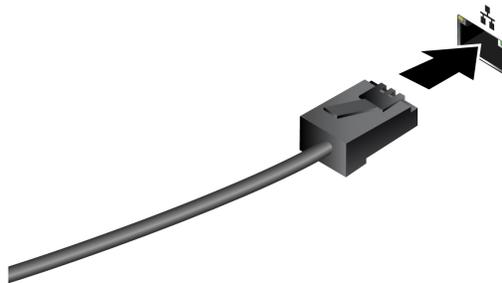
Adjust the computer stand (for selected models)

Full-function monitor stand

With a full-function monitor stand, you can:

- Tilt the monitor upward (up to 22 degrees) or downward (up to 5 degrees).
- Adjust the height of the monitor (up to 150 mm).

- Turn the monitor left or right (up to 45 degrees for each).
- Rotate the monitor. See "Rotate the monitor (for selected models)" on page 11.
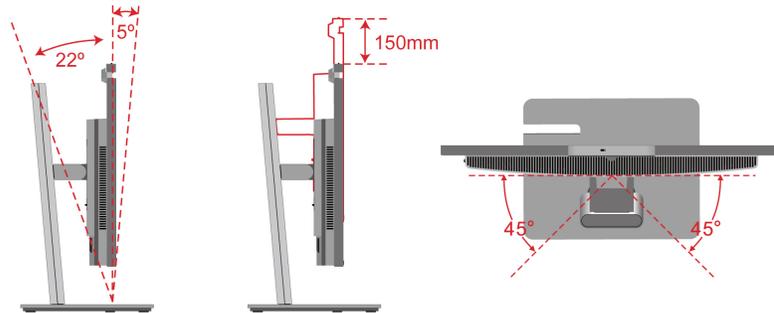
Tilt-only stand

With a tilt-only stand, you can tilt the monitor upward (up to 25 degrees) or downward (up to 5 degrees).
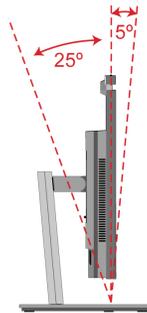
UltraFlex stand

With an UltraFlex stand, you can:

- Tilt the monitor upward (up to 70 degrees) or downward (up to 5 degrees).
- Open the upper stand (up to 70 degrees).
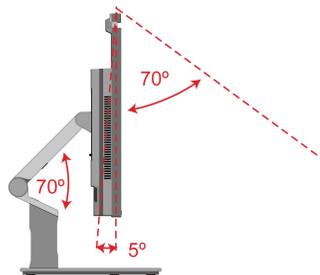
Rotate the monitor (for selected models)

The full-function monitor stand supports rotating the computer monitor in the following way.

1. Adjust the monitor to the highest point (150 mm) and tilt it upward to the maximum (22 degrees).

2. Rotate the computer monitor clockwise from horizontal to vertical direction or rotate the monitor counterclockwise from vertical to horizontal direction.
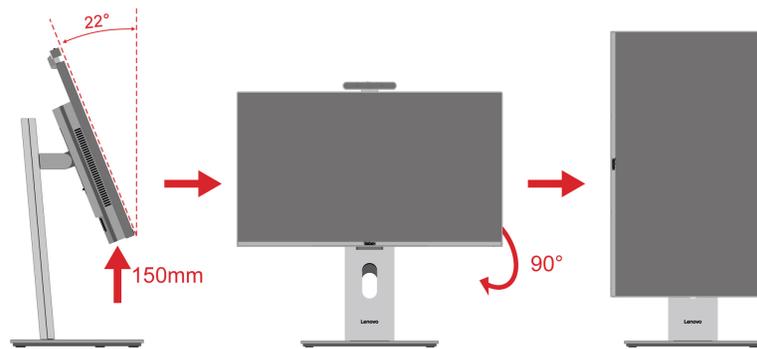
Adjust the tiltable camera (for selected models)

You can swivel the camera clockwise to the back or tilt the camera upward or downward (up to 20 degrees for each).
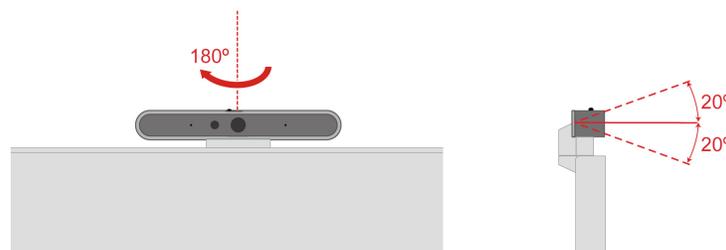
Connect to a Bluetooth device (for selected models)

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

Conventional pair

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

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

Step 2. Turn on both the Bluetooth on your computer and the Bluetooth device. Make sure the device is discoverable.

Step 3. Select the device when it is displayed on the **Add a device** list, and then follow the on-screen instructions.

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

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

Swift pair

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

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

Step 1.   Enable swift pair notification on Bluetooth settings page.

Step 2.   Turn on both the Bluetooth on your computer and the Bluetooth device. Make sure the device is discoverable.

Step 3.   Click **Connect** when a swift pair notification appears on your computer.

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

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

Connect to external displays

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

Connect to a wired display

1. Connect one end of the display cable or adapter to the HDMI, DisplayPort, or USB-C connector (Thunderbolt 4) on your computer.
2. Connect the other end of the cable or adapter to the external display.

Change display settings

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

Chapter 3. Explore your computer

Intelligent features

Lenovo PCs are continuously developing convenient and intelligent features to enhance users' computing experiences. This section explores the intelligent features and software that may be available on your computer.

Lenovo AI Now or Lenovo Xiaotian (for selected models)

Lenovo AI Now or Lenovo Xiaotian is a personal and private AI assistant to help with inspiration, writing, summarizing, and quick settings for your computer. Depending on the country or region, either of them might be available.

Access the apps

- Use the Lenovo AI Now icon 🌼 or Lenovo Xiaotian icon 🔵 if present on the taskbar.
- Or type the app name in the Windows search box and press Enter.

Explore key features

- Import files to create your personal knowledge base and start searching, Q&A, summarization, and generation based on it.
- Set up your computer or find service information. For example, you can ask it to help turn on the Eye Care mode or find the nearest service center.

Notes:

- For more information about Lenovo AI Now or Lenovo Xiaotian, see the User Guide in the apps' Help Center.
- Software features may vary by computer model and be subject to change. Explore the apps based on your actual user interface.

Lenovo AI Turbo Engine (for selected models)

Lenovo AI Turbo Engine is a smart audio and video enhancement software. Powered by plentiful sensing and computing adaption technologies, it can optimize your experience in video and audio capture and playback.

Access the app

- Use the Lenovo AI Turbo Engine icon 🌀 if present on the taskbar.
- Or type the app name in the Windows search box and press Enter.

Explore key features

- **Video enhancement**
  - **Auto framing mode** (for a single person): Automatically track and keep your face centered in the video.
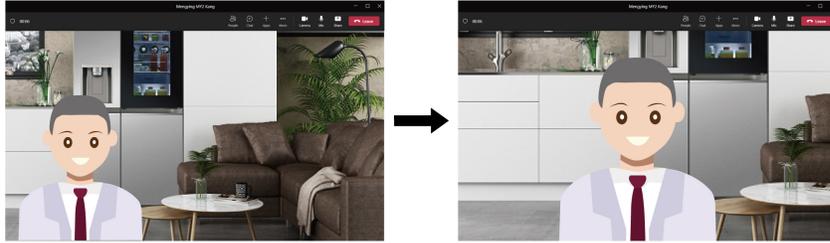
– **Auto framing mode** (for multiple persons): Automatically crop the video to capture all persons' faces.
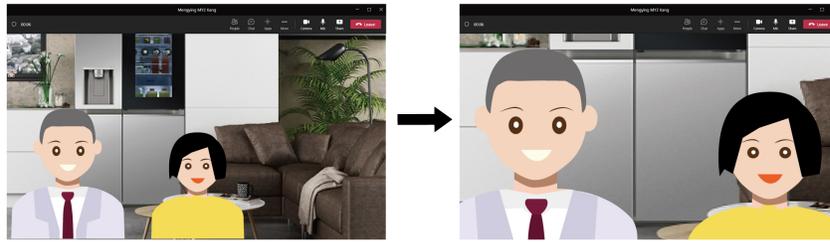
– **Single-person tracking mode**: You can manually select this mode to track only one person's face even if others are present.

- **Audio enhancement**

  – **Microphone capture effect auto adaption**: The microphone capture scope can change based on the number of persons captured by the camera.
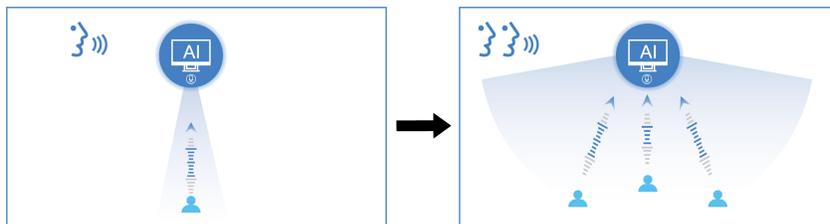
Note: You can also manually switch between personal, shared, or music modes based on your needs.

– **Speaker playback effect auto adaption**: The speaker playback effect can change depending on the audio type.

– **Speaker playback volume auto adaption** (for models with a radar card): System volume can change according to the user's distance from the speaker.
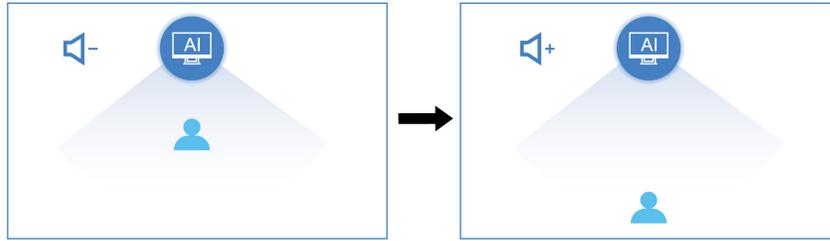
Notes:

- The available features vary depending on computer models.
- This app might not be available in your country or region.
- This app makes periodic updates of the features. Explore this app on your actual user interface.

Smart noise cancellation (for selected models)

Smart noise cancellation is a noise reduction feature available in Realtek Audio Console, Lenovo Audio Console, or Lenovo Smart Noise Cancellation. By filtering out input and output noises, it enhances your audio experience.
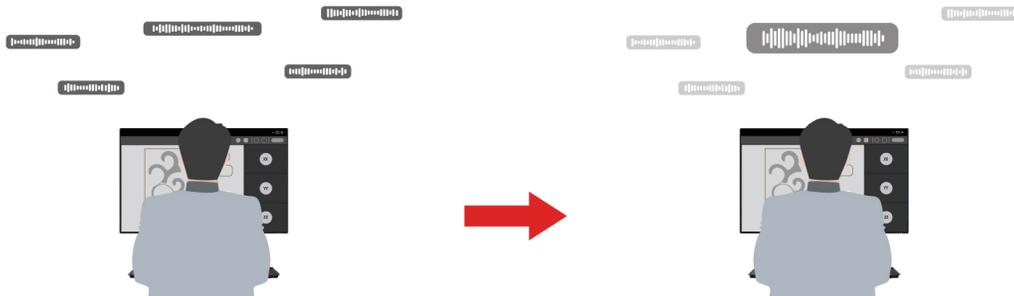
| Function	Description
Microphone noise cancellation	**AI noise reduction**: Your computer focuses on human voices and reduces ambient sounds. **Note:** When recording an instrument through microphones, it is recommended to disable this feature or switch to the music capture mode in the Lenovo AI Turbo Engine (if available).
	Target Speaker Tracking: This option requires you to register your voice so that your computer captures this voice only and tries to eliminate other voices.
	Far Field Pickup (FFP): Your computer can clearly pick up voice from a distance and you don't have to speak in front of the computer.
Speaker noise cancellation	Your computer filters out other sounds to play only human voices during voice calls.

Note: Depending on your hardware configuration, some of the features and options described above may not be supported.

Smart privacy protection (for selected models)

On some models with a radar card, the Vantage app provides the following features for you to protect privacy and personal data.

- **Privacy guard**

  When peeping behavior is detected, your screen blurs and displays an alert message. You can customize the warning interval according to your preference.
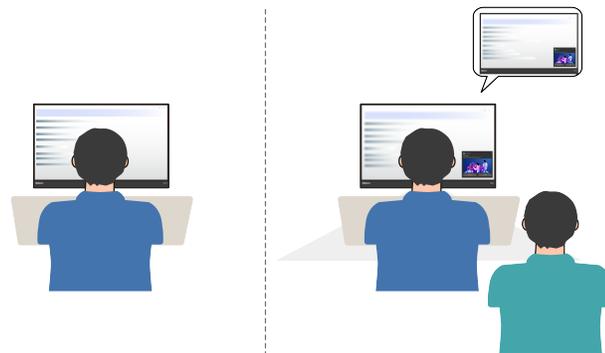
- **Zero touch lock and login**

  Your computer wakes up when you face the screen and dims and locks when you step away. You can adjust the screen-off settings to your preference. For models with an IR camera, you can set up Face ID for automatic unlocking.

To set these features, open the Vantage app, and go to **Device ➙ Device Settings Details ➙ Smart Assist**.

Note: Lenovo does not collect any personal data from the software.

Lenovo Smart Meeting (for selected models)

Lenovo Smart Meeting is a video conferencing app for working scenarios. It integrates multiple features to help enhance your professional image, protect your privacy, and reduce power consumption.

If you want your configurations of the app to also take effect on other mainstream video call apps, such as Microsoft Teams and Zoom, ensure that you select Lenovo Virtual Camera in the app.

Access the app

Type the app name in the Windows search box and press Enter.

Explore key features

- **Video enhancer**: Adjust the brightness automatically for better image quality in the video call.

- **Face framing**: Keep your face centered in the video call automatically when you move around.

- **Customized background**: Blur or customize your background in the video call to protect your privacy.

- **Temporary Avatar**: Create and display a temporary portrait of you as if you are still on the video conference when you are temporarily away.
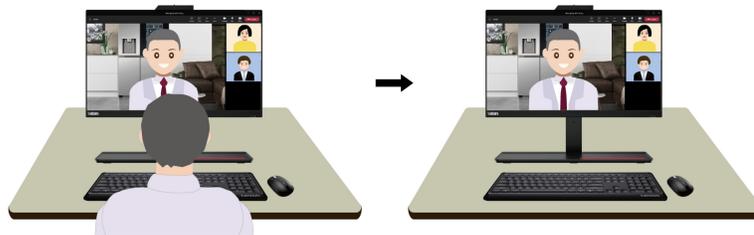
Notes:

- Lenovo does not collect any personal data from this app.
- The available features vary depending on the computer model.
- Lenovo Smart Meeting makes periodic feature updates to keep improving your experience with your computer. The description described here might be different from that on your actual user interface.

Use the touch screen (for selected models)

For computers with a touch-enabled screen, you can touch the screen directly with your fingers and interact with computer in a simple way. The following sections introduce frequently used touch gestures.

Notes:

- Some gestures might not be available when you are using certain apps.
- Do not use gloved fingers or incompatible pens for input on the screen. Otherwise, the touch screen might be not sensitive or does not respond.

- The touch screen is delicate. Do not apply pressure on the screen or touch the screen with anything hard or sharp. Otherwise, the touch panel might malfunction or get damaged.

One finger touch gesture

To do this	Gesture
Open a shortcut menu.	Tap and hold.
Open the widget panel.	Swipe from the left.
Open notification center.	Swipe from the right.
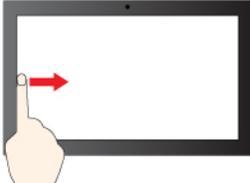
Two-finger touch gesture

To do this	Gesture
Zoom out.	Move two fingers towards.
Zoom in.	Spread two fingers apart.
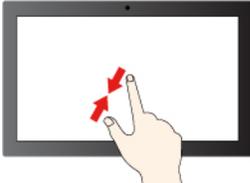
Three- and four-finger touch gesture

To do this	Gesture
Show all open windows.	Swipe with three fingers up.
Show the desktop.	Swipe with three fingers down.
Switch apps.	Swipe with three fingers to the left or right.
Switch desktops.	Swipe with four fingers to the left or right.
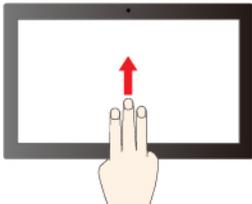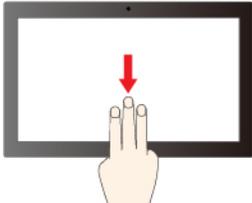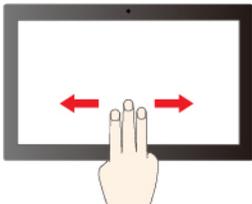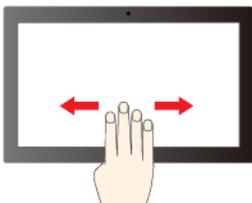
To enable three- and four-finger touch gestures, do the following:

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

Step 2.   Turn on the **Three- and four-finger touch gestures** switch.

Notes: If the touch screen is not sensitive or does not respond, do the following:

1. Turn off the computer.
2. Use a dry, soft, and lint-free cloth or a piece of absorbent cotton to remove fingerprints or dust from the touch screen. Do not apply solvents to the cloth.
3. Restart the computer and check if the touch screen works normally.
4. If the touch screen cannot work normally, type **Windows Update** in the Windows search box and then press Enter.
5. Follow the on-screen instructions to update Windows.
6. After updating Windows, check if the touch screen works normally.

7. If the touch screen still cannot work normally, the touch screen might get damaged. You can call Lenovo Customer Support Center to get further help.

Face authentication (for selected models)

Create your face ID and unlock your computer by scanning your face:

1. Type **Sign-in options** in the Windows search box and then press Enter.
2. Select the face ID setting and then follow the on-screen instruction to create your face ID.

Transfer data

You can install a disc or media card to transfer data.

Use the external ODD box (for selected models)

If your computer comes with an external ODD box and cable, read the following information.
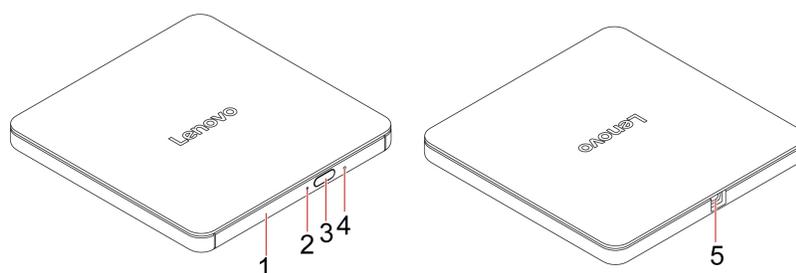
Item	Name	Description
1	ODD tray	The ODD tray opens automatically when you press the eject button.
2	ODD activity indicator	The indicator blinks when there is ODD activity.
3	Eject button	Press the button to open the ODD tray. The button works only when power is supplied to the ODD box.
4	Emergency-eject hole	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.
5	USB connector	To use the external ODD box, connect the external ODD cable to this USB connector and the computer.

Note: Depending on the models, some ODD boxes do not support write.

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 the card:

1. Click the triangular icon in the Windows notification area to show hidden icons. Right-click the icon prompting you to safely remove hardware and eject media.

2. Select the corresponding item to eject the card from the Windows operating system.

3. Press the card and remove it from your computer. Store the card safely for future use.

Set the power plan

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

- Turn off the display: After 10 minutes
- Put the computer to sleep: After 10 minutes

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

To set the power plan:

1. Type **Power Options** in the Windows search box and then press Enter.

2. Choose or customize a power plan of your preference.

ICE performance mode

The ICE performance mode helps you adjust the acoustic and thermal performance of your computer. Three options are available:

- **Balance mode**: The computer works at the balance mode with balanced noise and better performance.
- **Performance mode** (default setting): The computer works at the best performance with normal acoustic level.

  Note: The term "best" only refers to the best effect among different settings of the product itself.

- **Full Speed**: All fans in the computer will run at full speed.

Change the ICE performance mode

To change the ICE performance mode:

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

Step 2.　Select **Power ➙ Intelligent Cooling** and press Enter.

Step 3.　Select **Performance Mode** and press Enter.

Step 4.　Set the performance mode as desired.

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

Security

This computer offers a wealth of security measures to protect both the device and data safety.

Use physical locks

Security lock

With a security-lock slot available on the back, you can lock your computer to a desk, table, or other fixtures with a security lock.
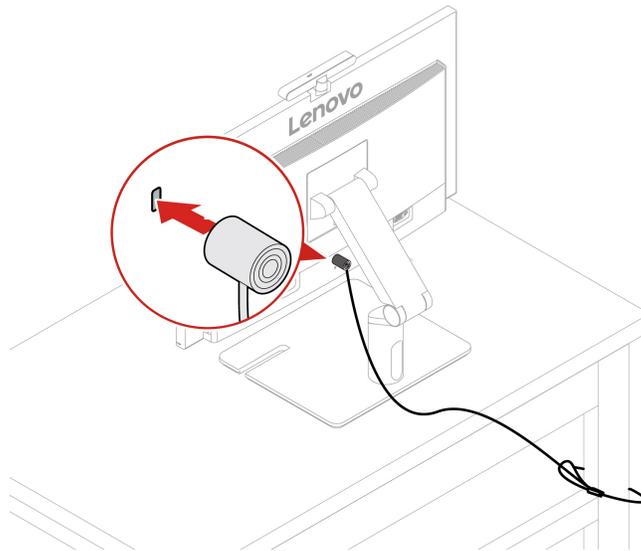
Note: Lenovo makes no comments, judgments, or warranties about the function, quality, or performance of the locking device and security feature. You can purchase computer locks from Lenovo.

Camera shutter (for selected models)

The camera shutter is a sliding cap that you can move to block the camera lens. The camera shutter is designed for privacy protection.
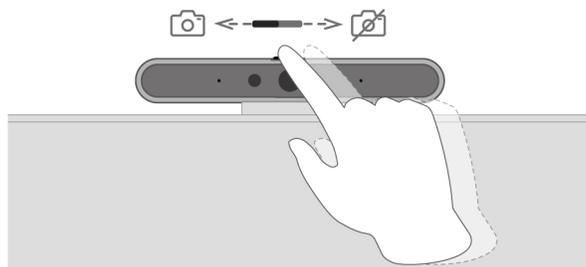
Use software security solutions

The following software solutions help secure your computer and information.

- **Windows Security**

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

- **Antivirus programs**

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

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

Use BIOS security solutions

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

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 or close the computer cover and disable the cover presence switch 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.

Absolute Persistence

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

Smart USB Protection (for selected models)

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.

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.

UEFI BIOS passwords

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

Password types

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

• Power-on password

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

• Supervisor password

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

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

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

• Hard disk password

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

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

- System management password (for selected models)

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

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

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

Set, change, and remove a password

Before you start, print these instructions.

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

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

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

Chapter 4. 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.

To explore the detailed settings:

- For computers purchased in mainland China

  You can contact Lenovo Customer Support Center as shown at https://newsupport.lenovo.com.cn/contacts.html.

- For computers purchased outside mainland China

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

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

Enable or disable the ErP LPS compliance mode

Lenovo computers meet the eco-design requirements of the ErP Lot 3 regulation. Follow the instruction to enable or disable the ErP LPS compliance mode.

For more information about the eco-design requirements, 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. To enable or disable the ErP LPS compliance mode:

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

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

Step 3. Enable or disable the feature as desired.

> **Note:** Please note that when the Enhanced Power Saving Mode is disabled, the power consumption might be increased when the computer is off.

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

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

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

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

1. Go to **Control Panel** and view by large icons or small icons.
2. Click **Power Options** ➙ **Choose what the power buttons do** ➙ **Change settings that are currently unavailable**.
3. Clear the **Turn on fast startup (recommended)** option from the **Shutdown settings** list.

Update the UEFI BIOS

When you install a new program, device driver, or hardware component, you might need to update the UEFI BIOS.

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

From the Vantage app

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

Step 1. Open the Vantage app, and then click **System Update**.

Step 2. If the latest UEFI BIOS update package is available, follow the on-screen instructions to download and install the package.

From the Lenovo Support Web site

Follow the instructions to update the UEFI BIOS from the Lenovo Support Web site.

For computers purchased in mainland China

1. Go to https://newsupport.lenovo.com.cn.
2. Click **Download drivers and software**, and select or search product.
3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

For computers purchased outside mainland China

1. Go to https://pcsupport.lenovo.com and select the entry for your computer.

2. Click **Drivers & Software ➙ Manual Update ➙ BIOS/UEFI**.

3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

From the Windows Update

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

Step 1.   Type `Settings` in the Windows search box and press Enter.

Step 2.   Click **Windows Update ➙ Check for Updates**.

Step 3.   If a BIOS update package appears in your update list, click **Download or Install** to initiate the update.

Chapter 5. CRU replacement

What is CRU

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

- ac power adapter (for ThinkCentre M70a Gen 6 only)

- Computer stand*

- External ODD box and cable*

- Keyboard*

- Mouse*

- Power cord

Optional-service CRUs

- M.2 solid-state drive (SSD)*

- Memory module

- Rear cover

- System board shield

* for selected models

Computer stand (for selected models)

Prerequisite

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

For access, do the following:

1. Turn off the computer and remove all connected devices and cables.
2. Disconnect the computer from ac power and all connected cables.
3. Place a soft, clean towel or cloth on the desk or surface. Hold the sides of your computer and gently lay it down so that the screen is against the surface and the computer cover is facing up.

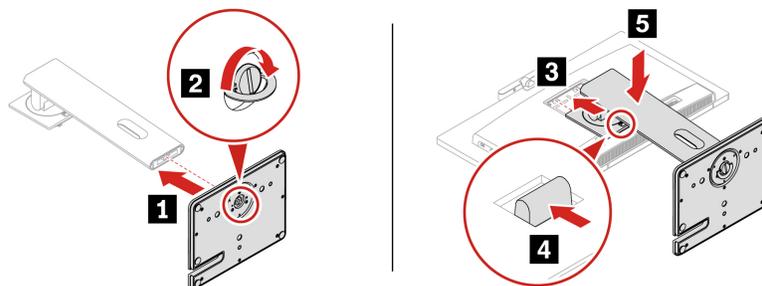**Replacement steps**

- **Full-function monitor stand**

  1. Remove the stand from the computer. Detach the stand arm from the base if needed.
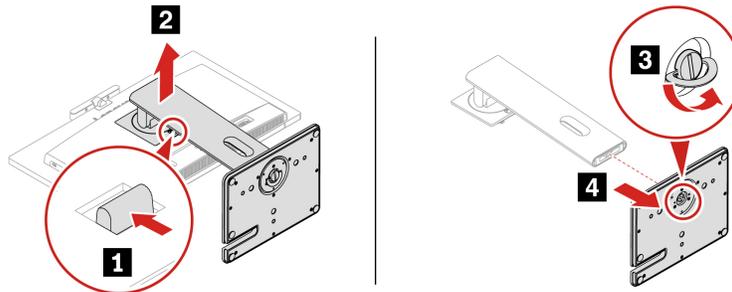
  2. Connect the stand arm and base of a new stand. Mount the stand on the computer.

     Note: Some computer models might not be shipped with a computer stand. In this case, remove the mylar over the VESA mounting first if you want to install a new computer stand.

- **Tilt-only stand**

  1. Remove the stand from the computer. Detach the stand arm from the base if needed.

2. Connect the stand arm and base of a new stand. Mount the stand on the computer.

   Note: Some computer models might not be shipped with a computer stand. In this case, remove the mylar over the VESA mounting first if you want to install a new computer stand.

- **UltraFlex stand**

   1. Remove the stand from the computer. Detach the stand arm from the base if needed.
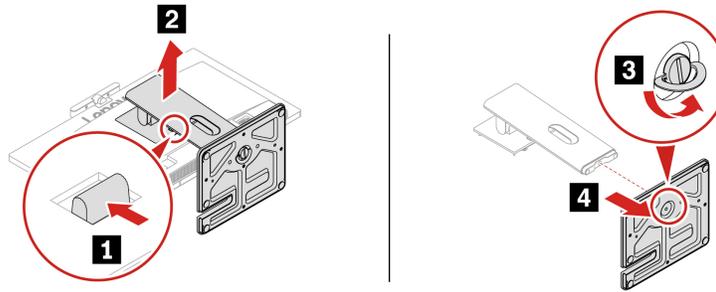
2. Connect the stand arm and base of a new stand. Mount the stand on the computer.

   Note: Some computer models might not be shipped with a computer stand. In this case, remove the mylar over the VESA mounting first if you want to install a new computer stand.
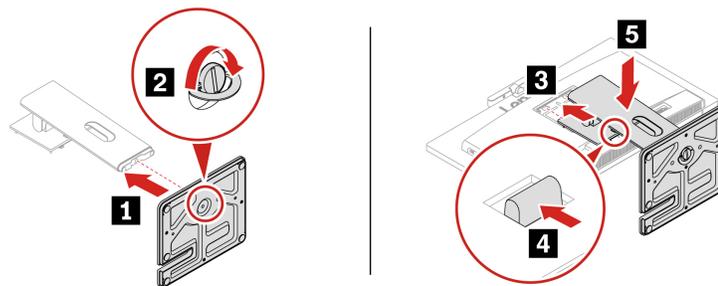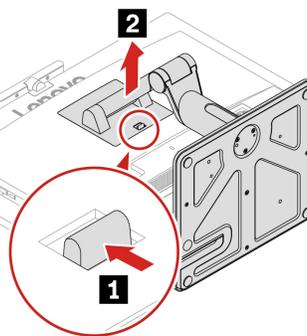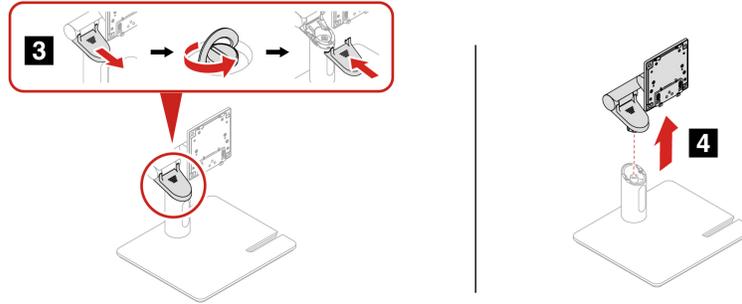

Rear cover

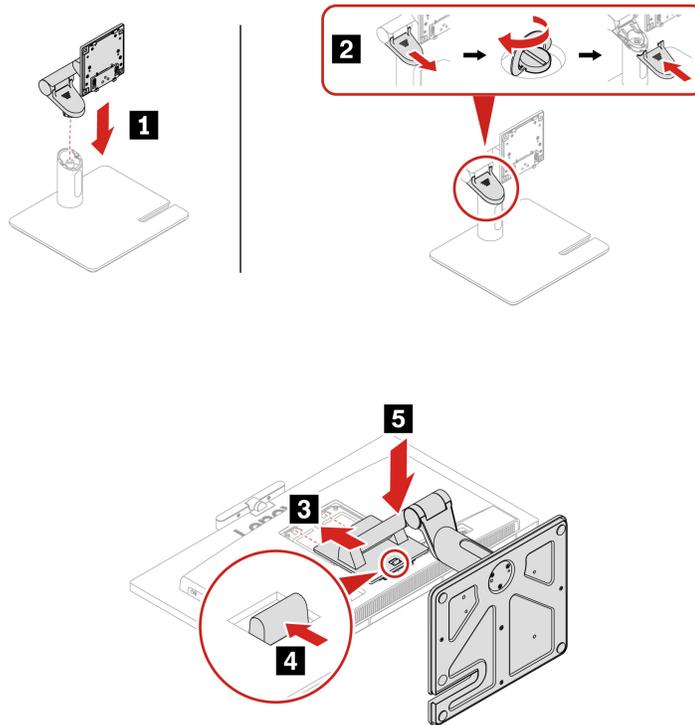**Prerequisite**

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

Before you open the rear cover, turn off the computer and wait several minutes until the computer is cool.
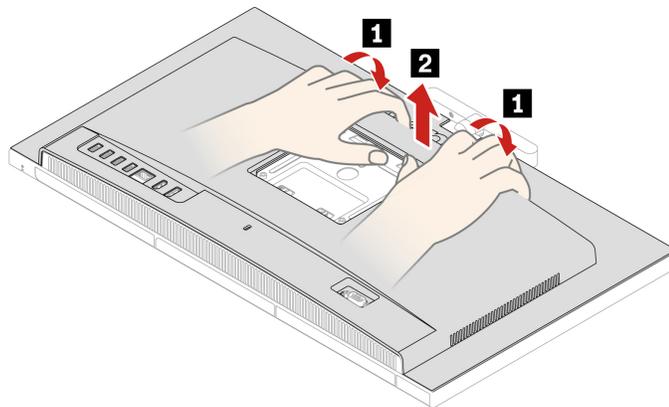
For access, do the following:

1. Turn off the computer and remove all connected devices and cables.
2. Unlock any locking device that secures the computer cover.
3. Place a soft, clean towel or cloth on the desk or surface. Hold the sides of your computer and gently lay it down so that the screen is against the surface and the computer cover is facing up.
4. Remove the computer stand, if any. See "Computer stand (for selected models)" on page 34.

Note: Some computer models might not be shipped with a serial connector module. In this case, remove the dummy cover for the serial connector module first.

Replacement steps

1. Grab the rear cover from the upper edge of the computer's VESA mounting and lift the rear cover.

2. Align a new rear cover to the computer back and install it.

System board shield

Prerequisite

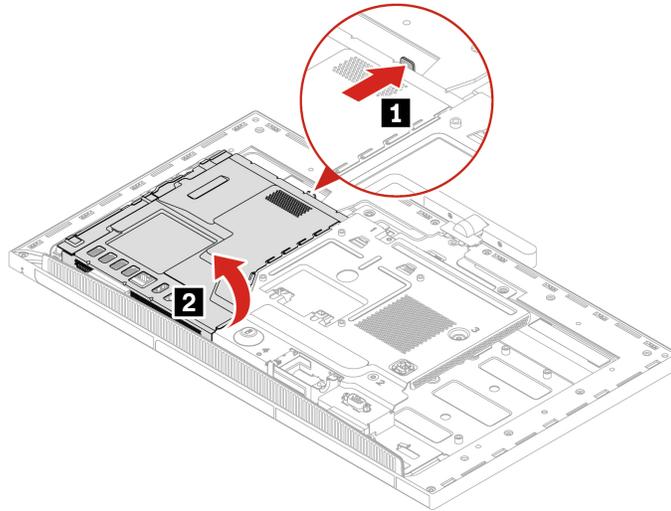Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the following parts, if any, in order.

- "Computer stand (for selected models)" on page 34
- "Rear cover" on page 36

Replacement steps

1. Push the hook that secures the upper edge of the system board shield outward, hold the right edge of the system board shield, and remove the shield.

2. Install a new system board shield in reverse order.

M.2 solid-state drive (SSD) (for selected models)

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 the following parts, if any, in order.

• "Computer stand (for selected models)" on page 34

• "Rear cover" on page 36

• "System board shield" on page 37

The M.2 SSD slots are located on the system board, as depicted in the following illustration.

• Slot 1 is for ThinkCentre M90a Gen 6 models only, supporting up to Gen 5 SSDs. Slot 2 and Slot 3 support up to Gen 4 SSDs.

• SSD installation should follow the sequence: Slot 1, Slot 2, then Slot 3.

• In systems equipped with an NPU card, Slot 3 is reserved for the NPU card.
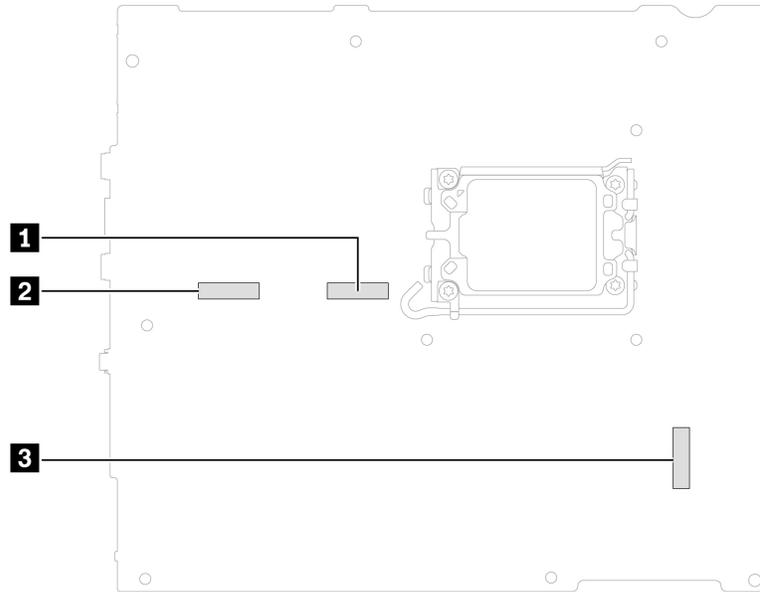
Removal steps for the SSD without a heat sink

1. Remove the screw that secures the SSD to the system board. Find the screw specification from the following table.

Screw	Quantity	Torque
M2 x L4 mm, Ni coated, silver	1	1.5 ± 0.2 kgf/cm

2. Remove the SSD and the thermal pad (if any) depending on the computer model.
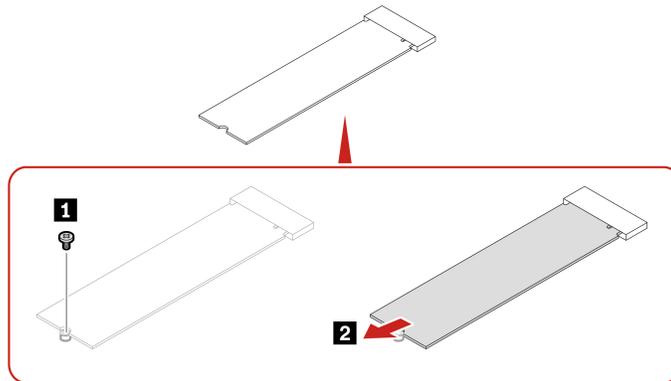

Removal steps for the SSD within a heat sink

1. Remove the screw which secures the heat sink to the system board. Find the screw specification from the following table.

Screw	Quantity	Torque
M2 x L4 mm, Ni coated, silver	1	1.5 ± 0.2 kgf/cm

2. Remove the heat sink.

3. Pinch the two latches on top of the heat sink to remove the heat sink cover.

4. Remove the SSD and the thermal pad (if any) depending on the computer model.
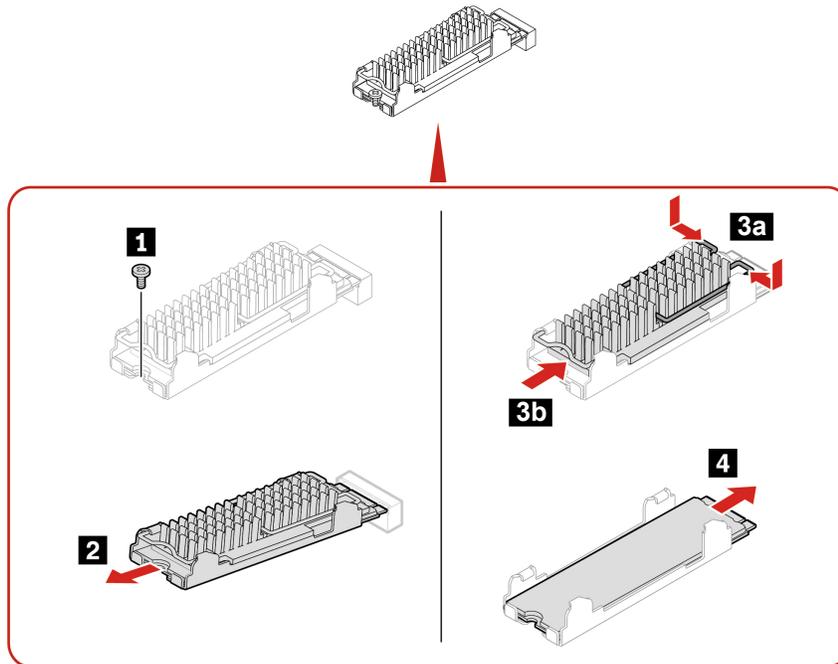
Notes:

- Install a new SSD in reverse order.

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

Memory module

Prerequisite

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

For access, remove the following parts, if any, in order.

- "Computer stand (for selected models)" on page 34
- "Rear cover" on page 36
- "System board shield" on page 37

This computer supports two memory slots beside the CPU. If you have only one memory module, install it to the slot that is closer to the CPU. If you have two memory modules, install them to both slots.
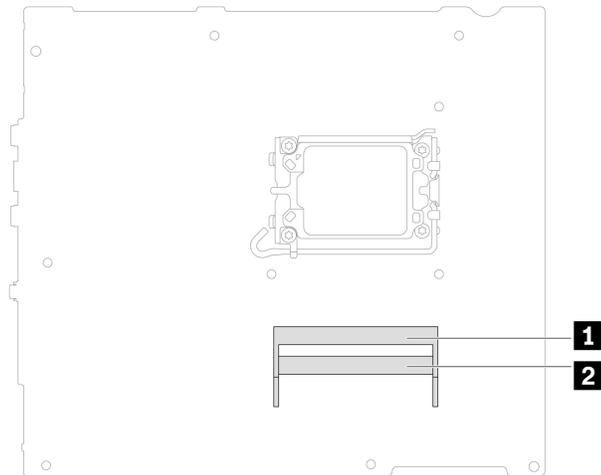
Replacement steps

1. Open the buckles on the two sides and remove the memory module.
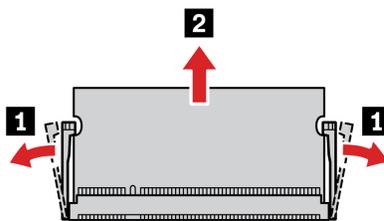
2. Insert a new memory module into the memory slot and press it down.
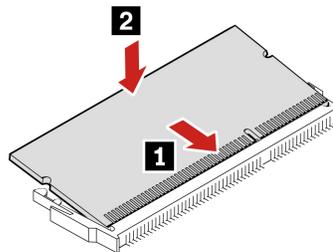
Chapter 6. Help and support

Find your serial number

This topic helps you find computer serial number.

You can find your serial number via:

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


```
MT-M  XXXX-XXXXXX  S/N XXXXXXXX
```
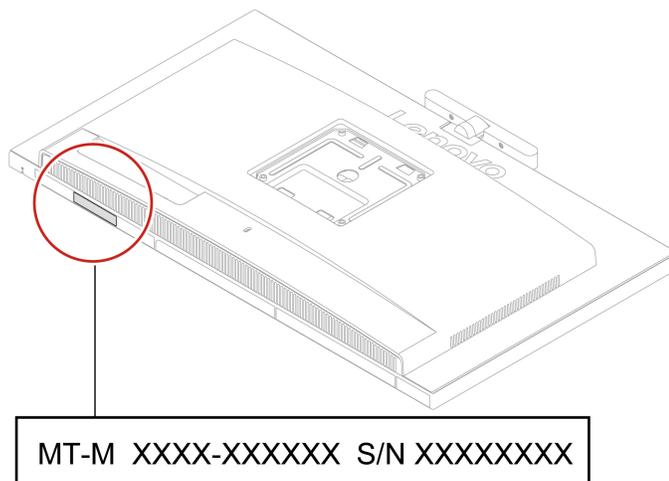
Diagnose and troubleshoot your computer

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

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

Diagnostics tool	Recommended scenario
Troubleshoot and diagnose at Lenovo Support Web site	You want to have an online troubleshooting or scan of hardware and drivers on your computer.
Hardware scan	- Your computer is installed with the Vantage app. - You want to perform basic examinations of the hardware components.

Troubleshoot and diagnose at Lenovo Support Web site

Lenovo provides two different diagnosing solutions to help you identify and resolve problems on your computer.

For computers purchased in mainland China

1. Go to https://newsupport.lenovo.com.cn/.

2. Enter the troubleshooting section and find the question you are encountering.

For computers purchased outside mainland China

1. Go to https://www.pcsupport.lenovo.com/ and enter your product name in the search box.

2. Click **Troubleshoot & Diagnose** and select the option that fits your need.

Notes:

- Before launching any automatic diagnosing process, a pop-up window will be prompted to install Lenovo Service Bridge. Lenovo Service Bridge helps to connect your computer with Lenovo diagnosing tools.

- Lenovo Support Web site makes periodic updates of the sections to keep improving your experience with your computer. The Web site interface and descriptions of sections might be different from that on your actual interface.

- If you are unaware of what problem your computer goes with, it is recommended that you select **Easy** and follow on-screen instructions to get your firmware updated and obtain the hardware status.

- If you have identified the problem on your computer, you can select **Custom** and follow on-screen instructions to resolve the problem.

If solutions can not resolve problems on your computer, you can follow on-screen instructions to submit an e-ticket or contact Lenovo for professional assistance.

Hardware scan

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

To run the Hardware scan:

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

Step 2.   Click **Hardware scan** or **Support** ➙ **Hardware scan**.

Step 3.   Select **QUICK SCAN** or **CUSTOMIZE** and then follow the on-screen instructions to run the hardware scan.

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

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

Recover your Windows operating system

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

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

For computers purchased in mainland China

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

For computers purchased outside mainland China

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

Call Lenovo

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

Before you contact Lenovo

Prepare the needed information before you contact Lenovo.

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

Self-help resources

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

Resources	How to access?
Lenovo Support Web Site	• For computers purchased in mainland China https://www.lenovo.com.cn • For computers purchased outside mainland China https://pcsupport.lenovo.com
Tips	• For computers purchased in mainland China https://iknow.lenovo.com.cn • For computers purchased outside mainland China https://www.lenovo.com/tips
Lenovo Community	• For computers purchased in mainland China https://iknow.lenovo.com.cn • For computers purchased outside mainland China https://forums.lenovo.com

Resources	How to access?
Accessibility information (for computers purchased outside China)	https://www.lenovo.com/accessibility
Windows help information	• Open the Start menu and click **Get Help** or **Tips**. • Use Windows Search. • Microsoft support Web site: https://support.microsoft.com

Purchase accessories or additional services

This topic provides instructions on how to purchase accessories or additional services.

Accessories

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

To shop at Lenovo, go to:

- For computers purchased in mainland China

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

  https://www.lenovo.com/accessories

Additional services

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

- For computers purchased in mainland China

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

  https://pcsupport.lenovo.com/warrantyupgrade

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

Accessibility features

Lenovo is committed to making information technology accessible to everyone, including individuals with hearing, vision, mobility, cognitive, or speech disabilities. To get the most up-to-date and detailed accessibility features information for the product, go to https://support.lenovo.com/docs/product_accessibility_features.

Appendix A. Notice for USB connector name update

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

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

Appendix B. Notices and trademarks

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