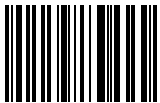


Machine type: 10059/7723  
10060/7724  
10068/7752  
10080/3099/1194  
10091/2558/1196

# Lenovo H4 Series Hardware Replacement Guide

Version 3.0 2011.08

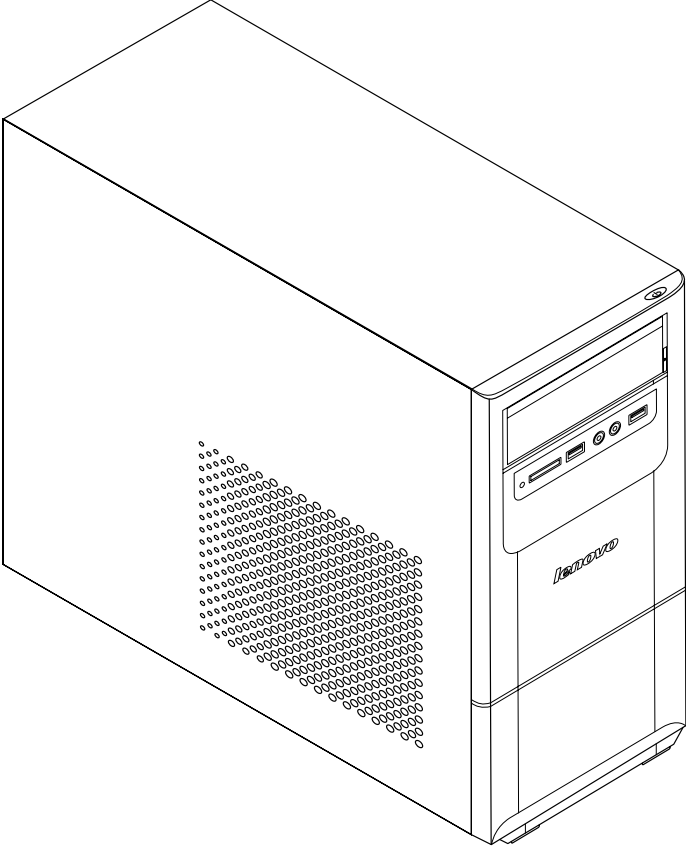


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# Hardware Replacement Guide



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# Contents

<b>Overview</b> .....	<b>1</b>
<b>Chapter 1 Locations</b> .....	<b>5</b>
Locating components .....	5
Locating connectors on the front of the computer.....	6
Locating connectors on the rear of the computer.....	7
Identifying parts on the system board .....	13
<b>Chapter 2 Replacing hardware</b> .....	<b>19</b>
Removing the computer cover .....	19
Removing and replacing the front bezel .....	21
Replacing a memory module .....	22
Replacing the hard disk drive.....	23
Replacing an optical drive .....	24
Replacing the heatsink assembly .....	26
Replacing a PCI or AGP adapter.....	28
Replacing the keyboard and mouse.....	30
Completing the installation.....	31
<b>Chapter 3 Appendix</b> .....	<b>33</b>




# Overview

This guide is intended to be used by customers who are replacing Customer Replaceable Units (CRUs) as well as trained service personnel who are replacing Field Replaceable Units (FRUs). In this guide, CRUs and FRUs will be referred to as parts.

 **Note:** Trained service personnel should refer to the *Hardware Maintenance Manual* (HMM) for parts ordering information.

This guide does not include procedures for all parts. It is expected that cables, switches, and certain mechanical parts can be replaced by trained service personnel without the need for step-by-step procedures.

 **Note:** Use only parts provided by Lenovo™.

The description of the TV card in this manual applies only to machines which have a TV card. It does not apply to machines which do not have a TV card.

This guide contains procedures for replacing the following parts:

- Memory modules
- Hard disk drive
- Optical drive
- Graphic Card
- TV Tuner
- WLAN Card
- Heatsink & Fan
- Keyboard
- Mouse

## Safety information for replacing CRUs

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. If you no longer have this copy of the *Safety and Warranty Guide*, you can obtain one online from the Support Web site at <http://consumersupport.lenovo.com>.

## Additional information resources

If you have Internet access, the most up-to-date information for your computer is available from the World Wide Web.

You can find the following information:

- CRU removal and installation information
- Publications
- Troubleshooting information
- Parts information
- Links to other useful sources of information

To access this information, go to <http://consumersupport.lenovo.com>.

## Tools required

To disassemble the computer, you need the following tools:

- Wrist grounding strap and conductive mat for preventing electrostatic discharge
- Flat screwdriver
- Phillips screwdriver
- Hex screwdriver
- Plastic flat screwdriver
- Plastic tweezers



**Note:** The screws for the different components vary in size. During the disassembly procedure, group the screws with their corresponding components to avoid a mismatch when replacing the components.

## Handling static-sensitive devices

Static electricity is harmless to you, but it can seriously damage computer components.

When you are replacing a part, do *not* open the antistatic package containing the new part until the defective part has been removed from the computer and you are ready to install the new part.

Take these precautions to avoid static electricity damage when handling parts and other computer components:

- Limit your movement. Movement can cause static electricity to build up around you.

- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts and other computer components.
- Before you replace a new part, touch the antistatic package containing the part to a metal expansion slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.
- When possible, remove the new part from its antistatic packaging and install it directly into the computer without setting the part down. When this is not possible, place the antistatic package that the part came in on a smooth, level surface and place the part on it.
- Do not place the part on the computer cover or other metal surface.



# 1

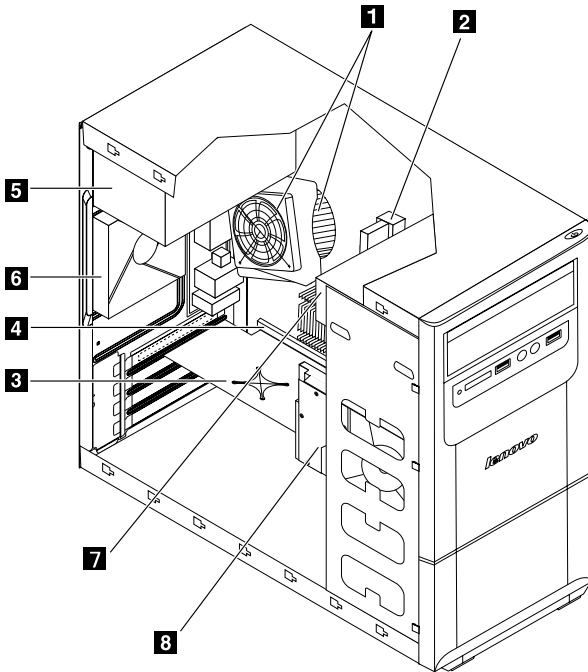
## Chapter

# Locations

This chapter provides illustrations to help locate the various connectors, controls and components of the computer. To remove the computer cover, refer to “Removing the computer cover”.

## Locating components

The following illustration will help you to locate the various components in your computer.

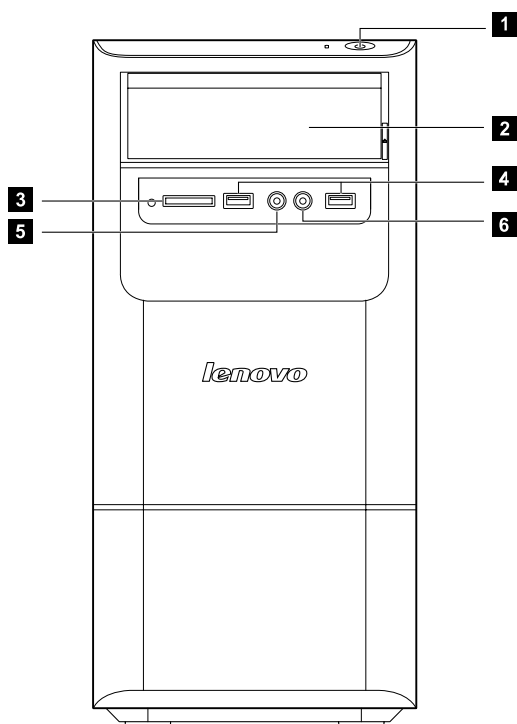


- 1** Microprocessor fan and heatsink
- 2** Memory modules

- 3** PCI express adapter card
- 4** PCI express adapter connectors
- 5** Power supply
- 6** System fan
- 7** Optical drive
- 8** Hard disk drive

## Locating connectors on the front of the computer

The following illustration shows the location of connectors on the front of the computer.



- 1** Power button
- 2** Optical Drive (Selected models only)
- 3** Memory card reader (Selected models only)
- 4** USB connectors (2)
- 5** Headphone connector
- 6** Microphone connector

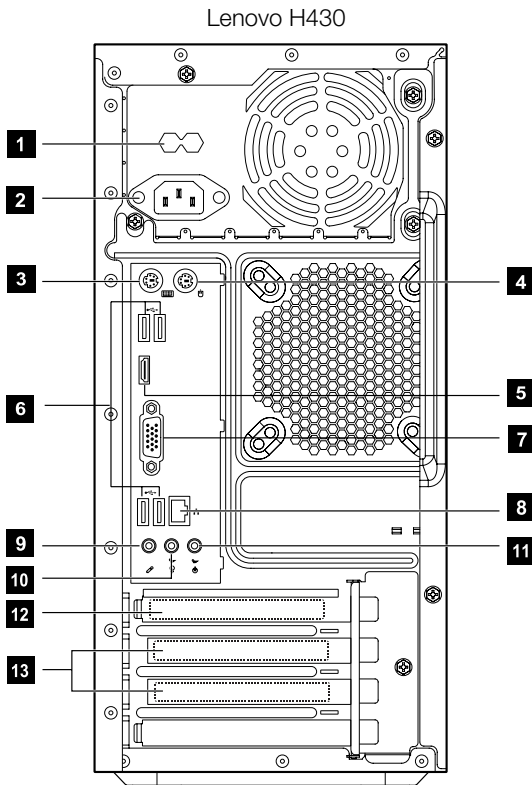


**Note:** This computer only can be placed in a vertical position.

## Locating connectors on the rear of the computer

The following illustrations show the location of connectors on the rear of the computer.

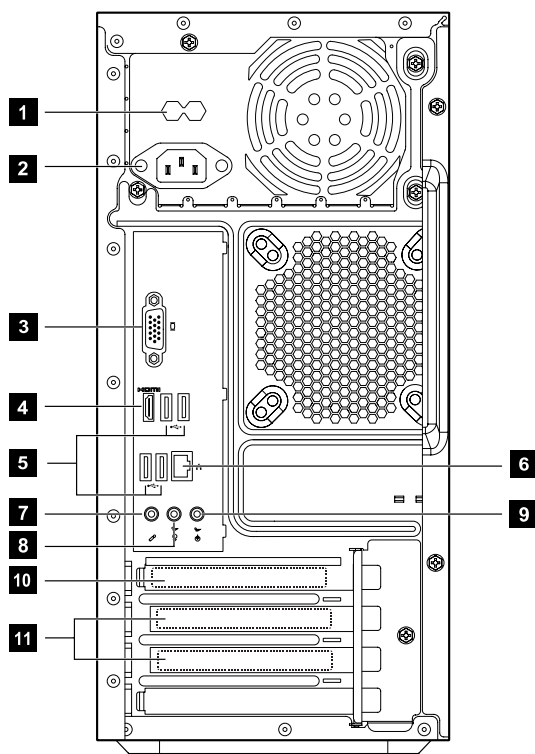
They show the placement of connectors for some but not all models. The location of the connectors on your computer may not be identical but should be similar to these. Please refer to the keys that follow the illustrations which identify the connectors.



- 1** Voltage selection switch (Selected models only)
- 2** Power connector
- 3** PS/2 keyboard connector (Selected models only)
- 4** PS/2 mouse connector (Selected models only)
- 5** HDMI connector (Selected models only)

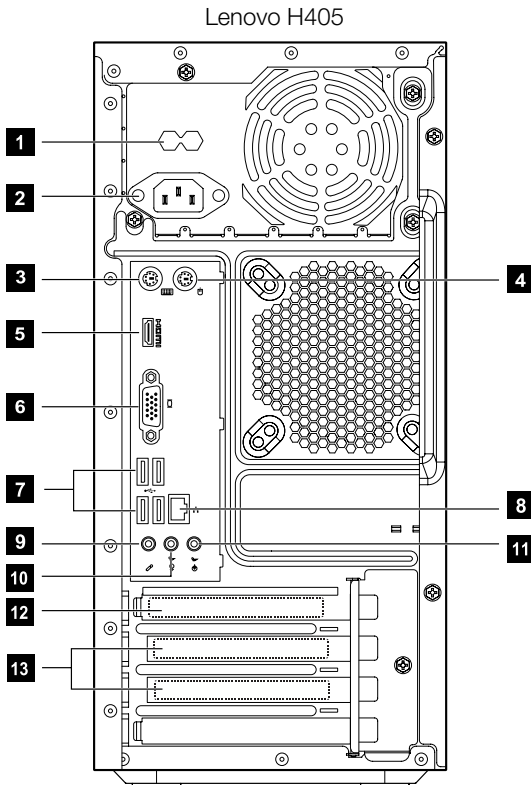
- 6** USB connectors (4)
- 7** On-board VGA connector
- 8** Ethernet connector
- 9** Microphone connector
- 10** Audio line-out connector
- 11** Audio line-in connector
- 12** Standalone graphic card (Selected models only)
- 13** Expansion card slots (Access connectors for any installed PCI express cards)

Lenovo H415



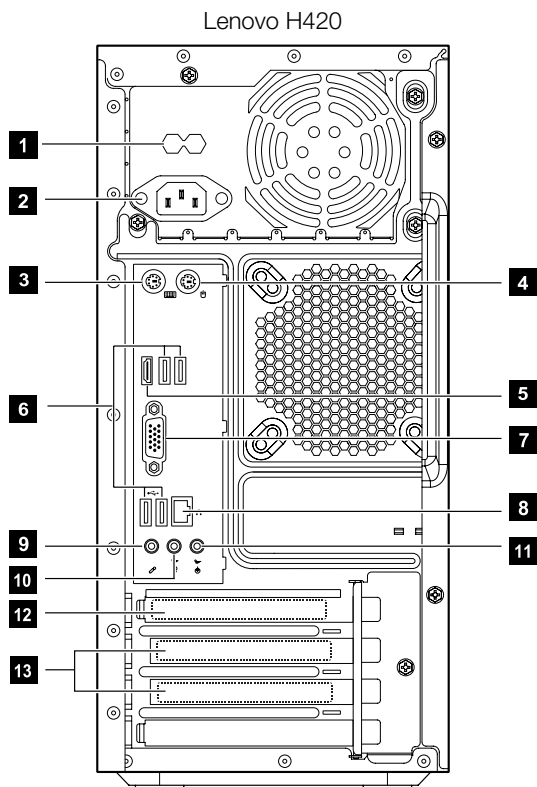
- 1** Voltage selection switch (Selected models only)
- 2** Power connector
- 3** On-board VGA connector (Selected models only)
- 4** HDMI connector (Selected models only)
- 5** USB connectors (4)

- 6** Ethernet connector
- 7** Microphone connector
- 8** Audio line-out connector
- 9** Audio line-in connector
- 10** PCI Express X 16 graphics adapter connector (Some models are equipped with a graphic card)
- 11** PCI Express X 1 adapter connector (Some models are equipped with a WIFI card or TV tuner card)



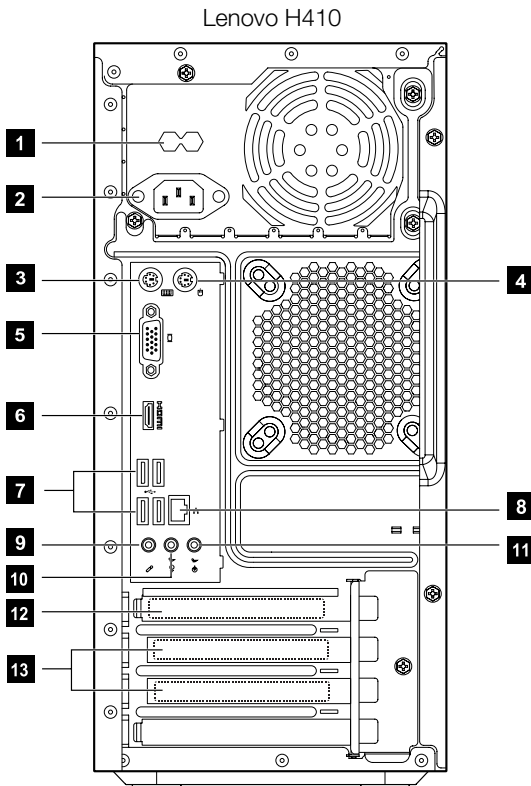
- 1** Voltage selection switch (Selected models only)
- 2** Power connector
- 3** PS/2 keyboard connector
- 4** PS/2 mouse connector
- 5** HDMI connector (Selected models only)

- 6** On-board VGA connector (Selected models only)
- 7** USB connectors (4)
- 8** Ethernet connector
- 9** Microphone connector
- 10** Audio line-out connector
- 11** Audio line-in connector
- 12** PCI Express X 16 graphics adapter connector (Some models are equipped with a graphic card)
- 13** PCI Express X 1 adapter connector (Some models are equipped with a WIFI card or TV tuner card)



- 1** Voltage selection switch (Selected models only)
- 2** Power connector
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- 4** PS/2 mouse connector
- 5** HDMI connector
- 6** USB connectors (4)
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- 12** Standalone graphic card (Selected models only)
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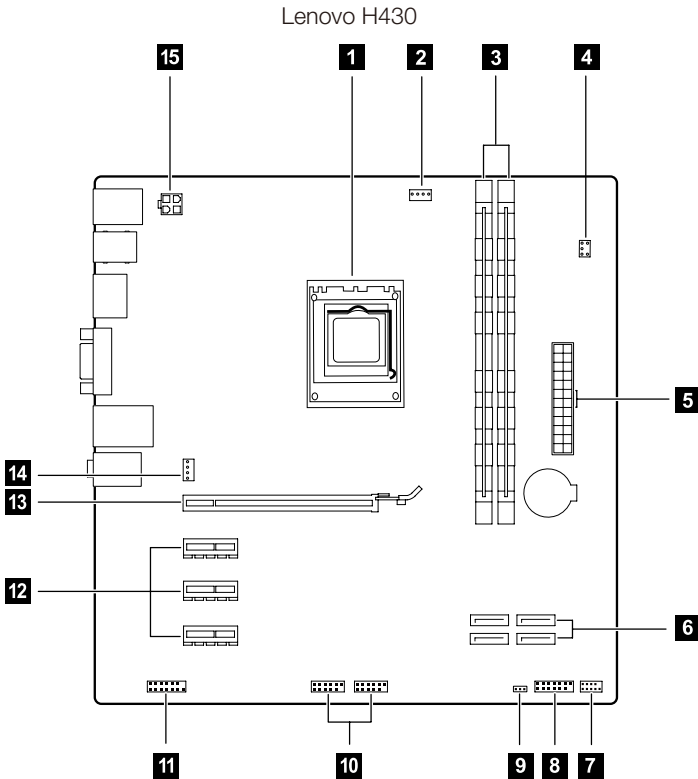
- 1** Voltage selection switch (Selected models only)
- 2** Power connector

- 3** PS/2 keyboard connector
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- 7** USB connectors (4)
- 8** Ethernet connector
- 9** Microphone connector
- 10** Audio line-out connector
- 11** Audio line-in connector
- 12** PCI Express X 16 graphics adapter connector (Some models are equipped with a graphics card)
- 13** PCI Express X 1 adapter connector (Some models are equipped with a WIFI card or TV tuner card.)

## Identifying parts on the system board

The system board (sometimes called the motherboard) is the main circuit board in your computer. It provides basic computer functions and supports a variety of devices that are factory-installed or that you can install later.

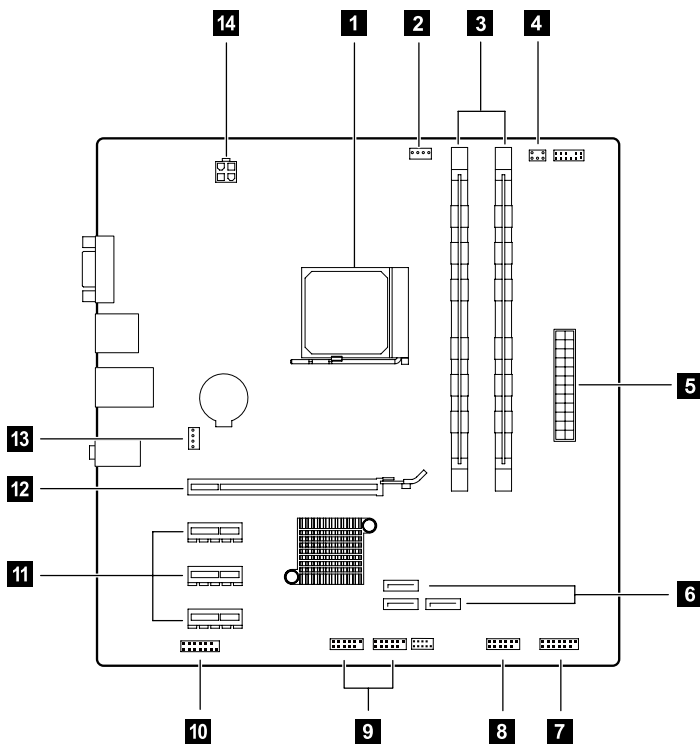
The following illustrations show the locations of parts on the system board.



- 1** Microprocessor and heat sink
- 2** Microprocessor fan connector
- 3** Memory connectors (2)
- 4** Thermal sensor header connector
- 5** Power connector
- 6** SATA connectors (4)
- 7** Power supply fan connector
- 8** Front panel connector

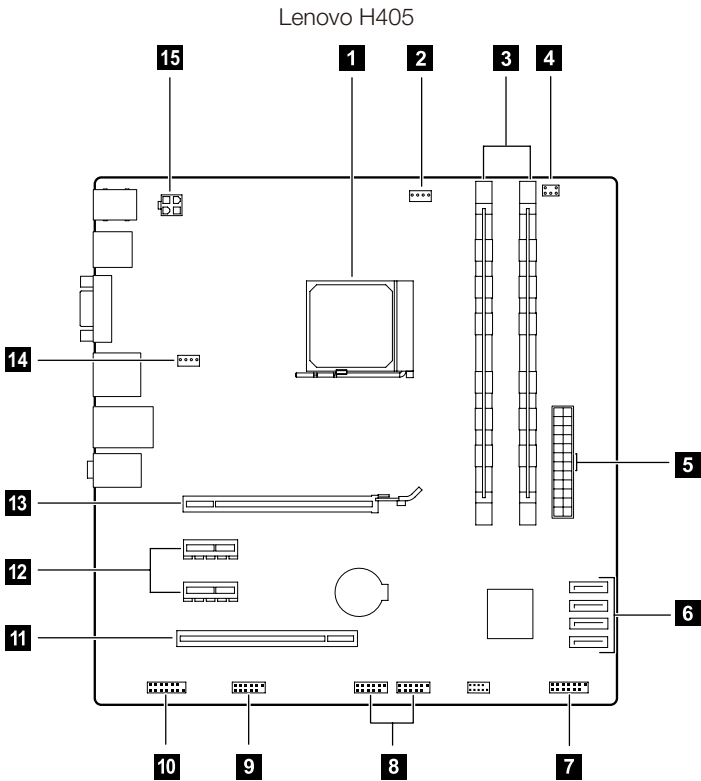
- 9** Clear CMOS
- 10** Front USB connectors (2)
- 11** Front audio connector
- 12** PCI express X 1 adapter connectors (3)
- 13** PCI express X 16 adapter connector
- 14** System fan connector
- 15** 12V power connector

Lenovo H415



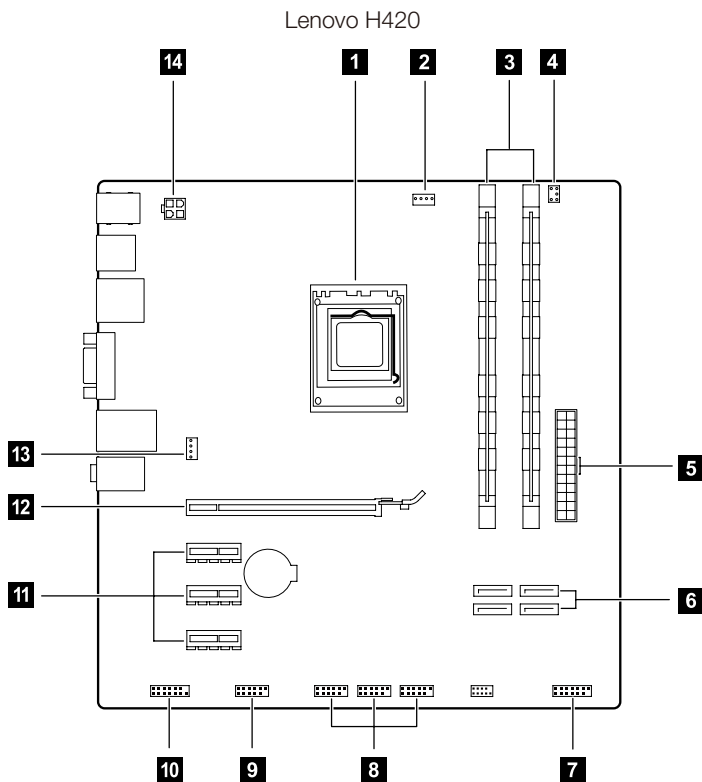
- 1** Microprocessor and heatsink
- 2** Microprocessor fan connector
- 3** Memory connectors (2)
- 4** Thermal sensor header connector
- 5** Power connector

- 6** SATA IDE connectors (3)
- 7** Front panel connector
- 8** Serial (com2) connector
- 9** Front USB connectors (2)
- 10** Front audio connector
- 11** PCI Express X 1 adapter connectors (3)
- 12** PCI Express X 16 adapter connector
- 13** System fan connector
- 14** 12V power connector



- 1** Microprocessor and heatsink
- 2** Microprocessor fan connector
- 3** Memory connectors (2)

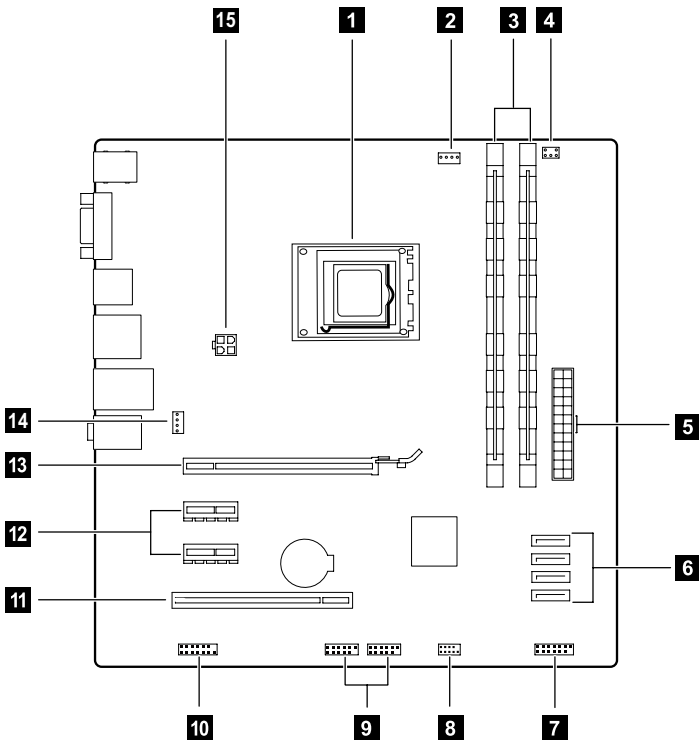
- 4** Thermal sensor header connector
- 5** Power connector
- 6** SATA IDE connectors (4)
- 7** Front panel connector
- 8** Front USB connectors (2)
- 9** Clear CMOS
- 10** Front audio connector
- 11** PCI adapter connector
- 12** PCI Express X 1 adapter connectors (2)
- 13** PCI Express X 16 adapter connector
- 14** System fan connector
- 15** 12V power connector



- 1** Microprocessor and heat sink

- 2** Microprocessor fan connector
- 3** Memory connectors (2)
- 4** Thermal sensor header connector
- 5** Power connector
- 6** SATA connectors (4)
- 7** Front panel connector
- 8** Front USB connectors (3)
- 9** Serial(com2) connector
- 10** Front audio connector
- 11** PCI express X 1 adapter connectors (3)
- 12** PCI express X 16 adapter connector
- 13** System fan connector
- 14** 12V power connector

Lenovo H410



- 1** Microprocessor and heatsink
- 2** Microprocessor fan connector
- 3** Memory connectors (2)
- 4** Thermal sensor header connector
- 5** Power connector
- 6** SATA IDE connectors (4)
- 7** Front panel connector
- 8** Clear CMOS
- 9** Front USB connectors (2)
- 10** Front audio connector
- 11** PCI adapter connector
- 12** PCI Express X 1 adapter connectors (2)
- 13** PCI Express X 16 adapter connector
- 14** System fan connector
- 15** 12V power connector

# 2

## Chapter

# Replacing hardware



### Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Safety and Warranty Guide* or *HMM*, go to the Support Web site at <http://consumersupport.lenovo.com>



**Note:** Use only parts provided by Lenovo.

## Removing the computer cover

### Important



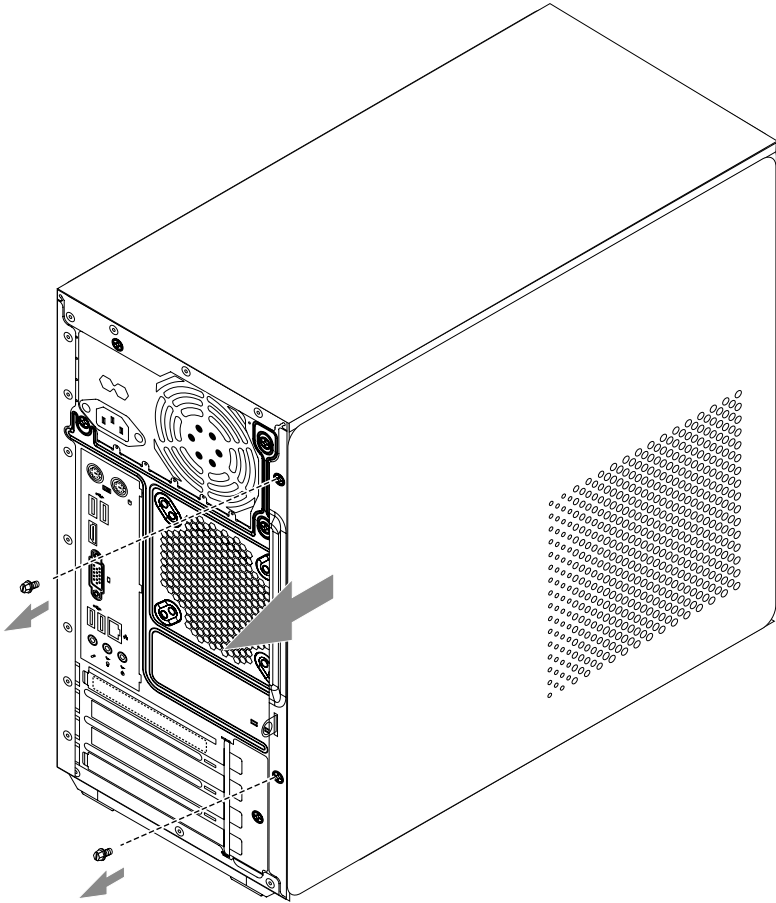
**Turn off the computer and wait three to five minutes to let it cool down before removing the cover.**

### To remove the computer cover:

1. Remove any media (disks, CDs, or memory cards) from the drives, shut down the operating system, and turn off the computer and all attached devices.
2. Unplug all power cords from electrical outlets.
3. Disconnect all cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. Refer to “Locating connectors on the rear of the computer”.
4. Remove the two screws that secure the computer cover at the rear of the chassis.

5. Slide the computer cover to the rear of the chassis to remove it.

 **Note:** For this procedure, it helps to lay the computer on its side.



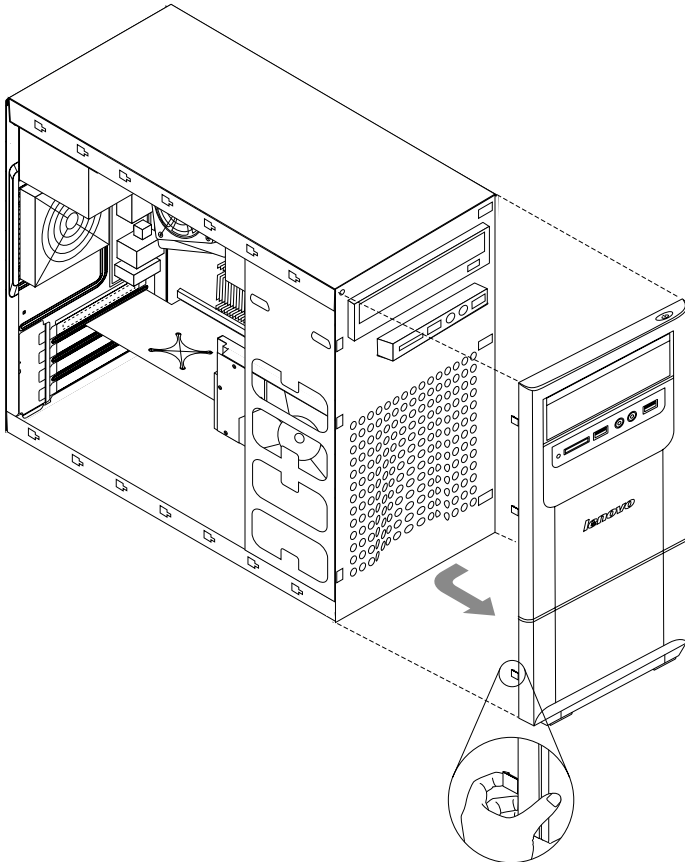
## Removing and replacing the front bezel

### To remove and replace the front bezel:

1. Remove the computer cover. Refer to “Removing the computer cover”.

**!** **Note:** For this procedure, it helps to lay the computer on its side.

2. Remove the front bezel by releasing the three plastic tabs inside the chassis and pushing the bezel outward as shown.



3. To reinstall the bezel, align the plastic tabs on the bottom of the bezel with the corresponding holes in the chassis, then snap them into position at the bottom and top.
4. Refer to “Completing the installation”.

# Replacing a memory module



## Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Safety and Warranty Guide* or *HMM*, go to the Support Web site at <http://consumersupport.lenovo.com>.

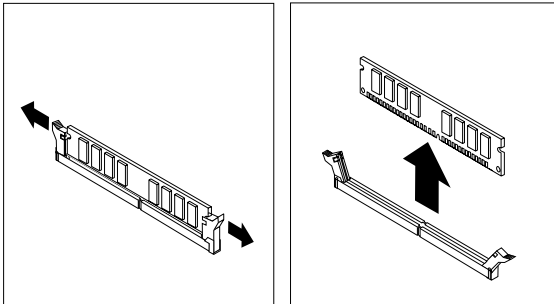
## To replace a memory module:

1. Remove the computer cover. Refer to “Removing the computer cover”.

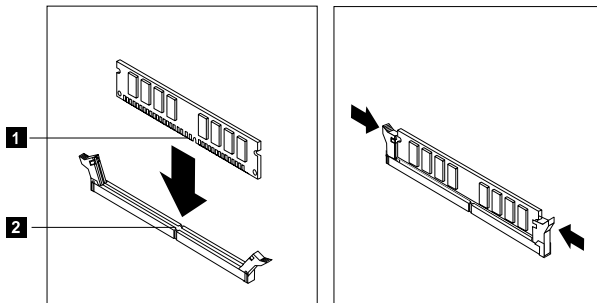


**Note:** For this procedure, it helps to lay the computer on its side.

2. Locate the memory module connectors. Refer to “Locating components”.
3. Remove the memory module being replaced by opening the retaining clips as shown.



4. Position the new memory module over the memory connector. Make sure the notch **1** on the memory aligns correctly with the connector key **2** on the system board. Push the memory module straight down into the connector until the retaining clips close.



5. Refer to “Completing the installation”.

## Replacing the hard disk drive



### Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Safety and Warranty Guide* or *HMM*, go to the Support Web site at <http://consumersupport.lenovo.com>.

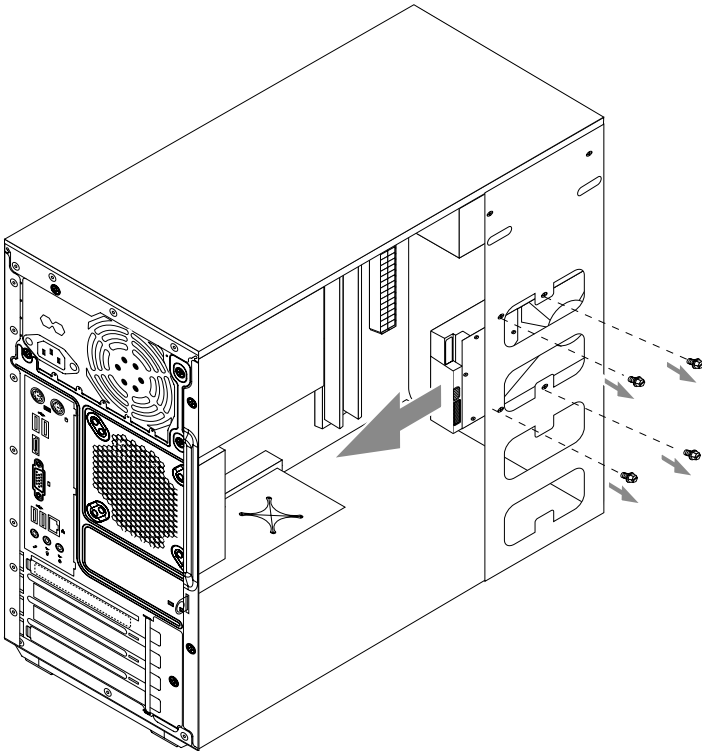
### To replace the hard disk drive:

1. Remove the computer cover. Refer to “Removing the computer cover”.



**Note:** For this procedure, it helps to lay the computer on its side.

2. Disconnect the data and power cables from the hard disk drive.



3. Remove the four screws that secure the hard disk drive to drive bay.
4. Remove the hard disk drive by pulling it straight out of the drive bay.
5. Slide the new hard disk drive into the drive bay.
6. Secure the new hard disk drive to the drive bay with the four screws.
7. Connect the power and data cables to the hard disk drive. Refer to “Identifying parts on the system board”.
8. Refer to “Completing the installation”.

## Replacing an optical drive



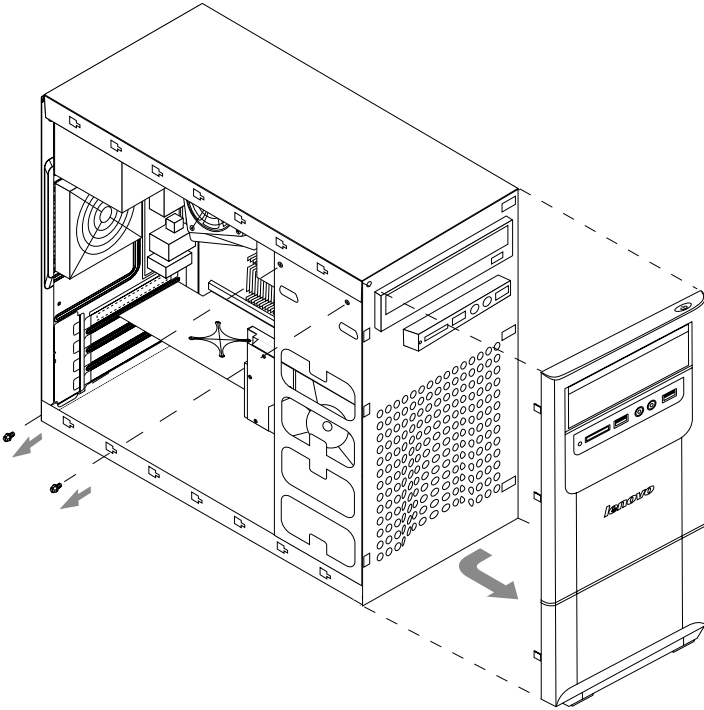
### Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer or in the *Hardware Maintenance Manual* (HMM) for the computer. To obtain copies of the *Safety and Warranty Guide* or *HMM*, go to the Support Web site at <http://consumersupport.lenovo.com>.

### To replace an optical drive

1. Remove the computer cover. Refer to “Removing the computer cover”.
2. Remove the front bezel. Refer to “Removing and replacing the front bezel”.
3. Disconnect the data and power cables from the rear of the optical drive.
4. Remove the two screws that secure the optical drive to drive bay.

5. Push the optical drive straight out of the front of the chassis.



6. Slide the new optical drive into the bay from the back until it snaps into position.
7. Secure the optical drive to the bay with the two screws.
8. Connect the data and power cables to the drive.
9. Install the front bezel. Refer to “Removing and replacing the front bezel”.
10. Refer to “Completing the installation”.

## Replacing the heatsink assembly

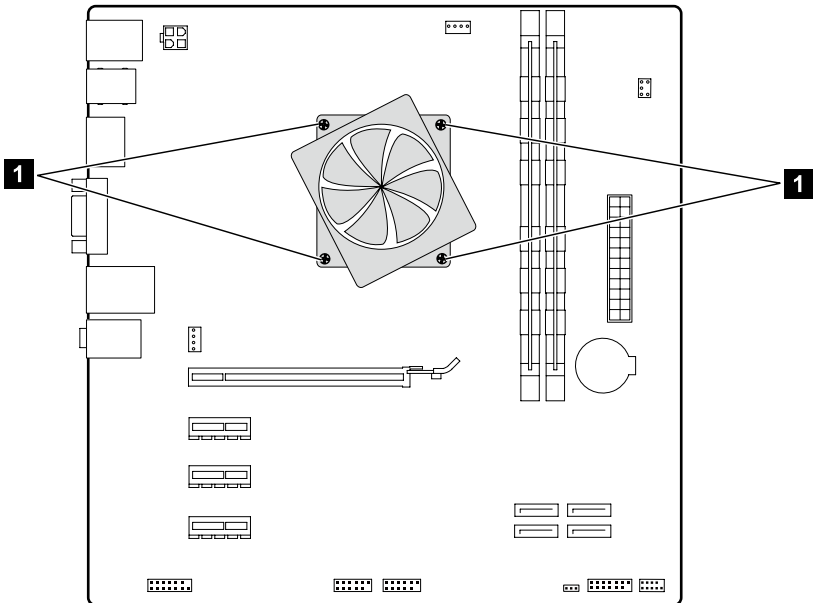


### Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Safety and Warranty Guide* or *HMM*, go to the Support Web site at: <http://consumersupport.lenovo.com>

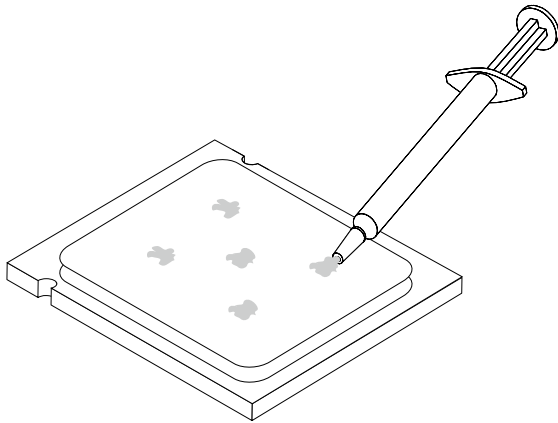
### To replace the heatsink assembly:

1. Remove the computer cover. Refer to “Removing the computer cover”.
2. Lay the computer on its side.
3. Locate the heatsink. Refer to “Identifying parts on the system board”.
4. Disconnect the heatsink and the fan assembly cable from the system board.
5. Remove the four screws **1** securing the heatsink and fan assembly to the system board.



6. Lift the failing heatsink and fan assembly off the system board.

7. Use the thermal grease syringe to place five drops of grease on the top of the microprocessor. Each drop of grease should be 0.03ml (3 tick marks on the grease syringe).



8. Install the heatsink and fan assembly onto the heatsink retention bracket.
9. Reconnect the disconnected cables to the system board.
10. Refer to “Completing the installation”.

# Replacing a PCI or AGP adapter

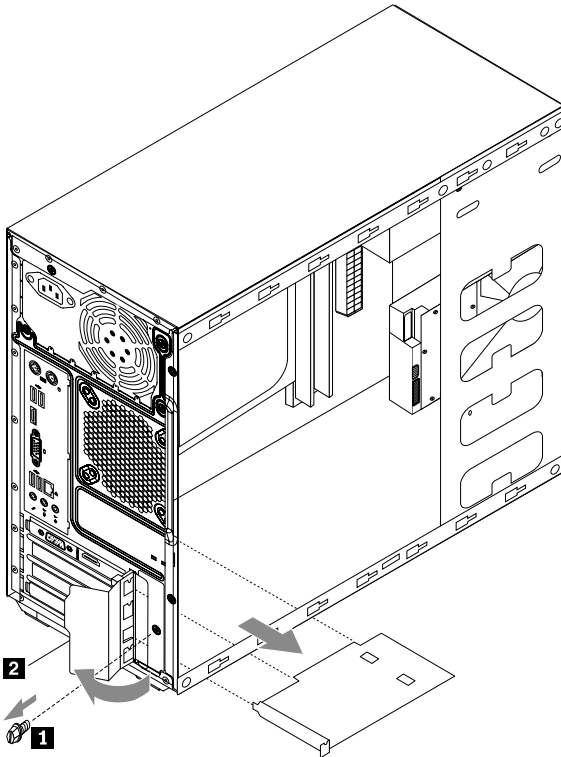


## Attention:

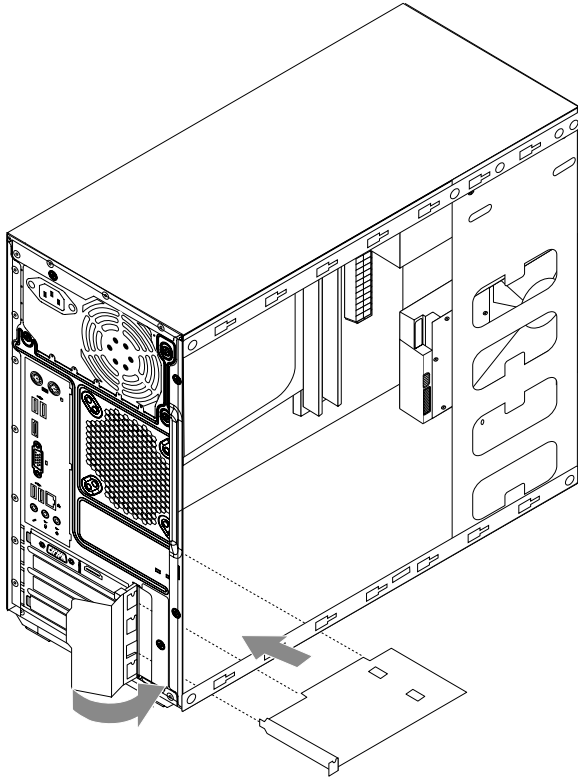
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## To replace an adapter:

1. Remove the computer cover. Refer to “Removing the computer cover”.
2. Remove the screw that secures the latch to the chassis, **1** open the adapter latch **2** and remove the adapter by pulling it straight out of the adapter connector.



3. Install the new adapter into the same adapter connector.



4. Ensure the adapter is fully seated into the adapter connector.
5. Screw the latch into the chassis.
6. Refer to “Completing the installation”.

## Replacing the keyboard and mouse



### Attention:

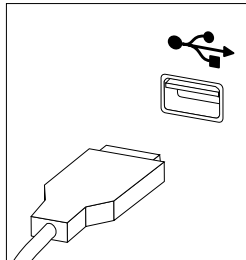
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### To replace the keyboard:

1. Remove any media (disks, CDs, or memory cards) from the drives, shut down the operating system, and turn off the computer and all attached devices.
2. Unplug all power cords from electrical outlets.
3. Locate the connector for the keyboard. Refer to “Locating connectors on the rear of the computer” and “Locating connectors on the front of the computer”.



**Note:** Your keyboard will be connected to a USB connector at either front or at the rear of the computer.



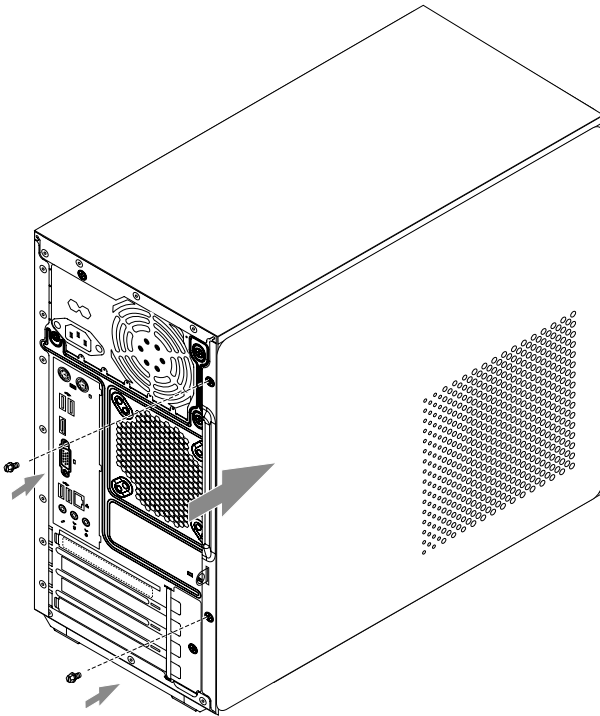
4. Disconnect the failing keyboard cable from the computer and connect the new keyboard cable to the same connector.
5. Refer to “Completing the installation”.
6. The mouse can be replaced using the same method.

## Completing the installation

After replacing a part or parts, you must close the computer cover and reconnect all the cables, including telephone lines and power cords. Some parts will require confirming updated information in the Setup Utility program. Refer to “Starting the Setup Utility” in the *Hardware Maintenance Manual*.

### To complete the installation:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer. Refer to “Locating components” for the location of the various components.
2. Make sure that the cables are routed correctly before replacing the computer cover.
3. Position the computer cover on the chassis so that the rail guides on the bottom of the computer cover engage the rails. Then, push the computer cover closed until it snaps into position. Screw back the two screws on the chassis.



4. Reconnect the external cables and power cords to the computer. Refer to “Locating connectors on the front of the computer” and “Locating connectors on the rear of the computer”.



**Note:** In most areas of the world, Lenovo requires the return of the defective CRU. Information about this will come with the CRU or will come a few days after the CRU arrives.

# 3

## Chapter

## Appendix

### Declaration

Thank you for using Lenovo products.

Carefully read all documents shipped with your computer before you install and use the product for the first time. Lenovo is not responsible for any loss except when caused by installation and operations performed by Lenovo professional service personnel. You are responsible if you fail to operate the product according to instructions and requirements in the manuals included with your computer, or operate the product inappropriately.

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The software interface and function and hardware configuration described in the manuals included with your computer might not match exactly the actual configuration of the computer that you purchase. You are welcome to contact us about the manuals included with your computer. For the latest information or any questions or comments, contact or visit the Lenovo Web site:

Service Web site: <http://consumersupport.lenovo.com>

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