LCS 1206/ CED 1208: Practical Skills Development

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Detailed Module Description

Sub-module 4: Basics of Preventive Maintenance and Troubleshooting.

- Overview of Preventive Maintenance
- Steps of the Troubleshooting Process
- Common PC problems and solutions

Overview of Preventive Maintenance

This section describes the Preventive Maintenance Overview, benefits and tasks involved

Define Preventive Maintenance, Troubleshooting

Preventive Maintenance vs Troubleshooting

- **Preventive maintenance** is the regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems.
  - Effective preventive maintenance reduces part, material, and system faults, and keeps hardware and software in good working condition.
- **Troubleshooting** is the systematic process used to locate the cause of a fault in a computer system and correct the relevant hardware and software issues.
- In this module, you will learn general guidelines for creating preventive maintenance programs and troubleshooting procedures.
  - These guidelines are a starting point to help you develop your preventive maintenance and troubleshooting skills.
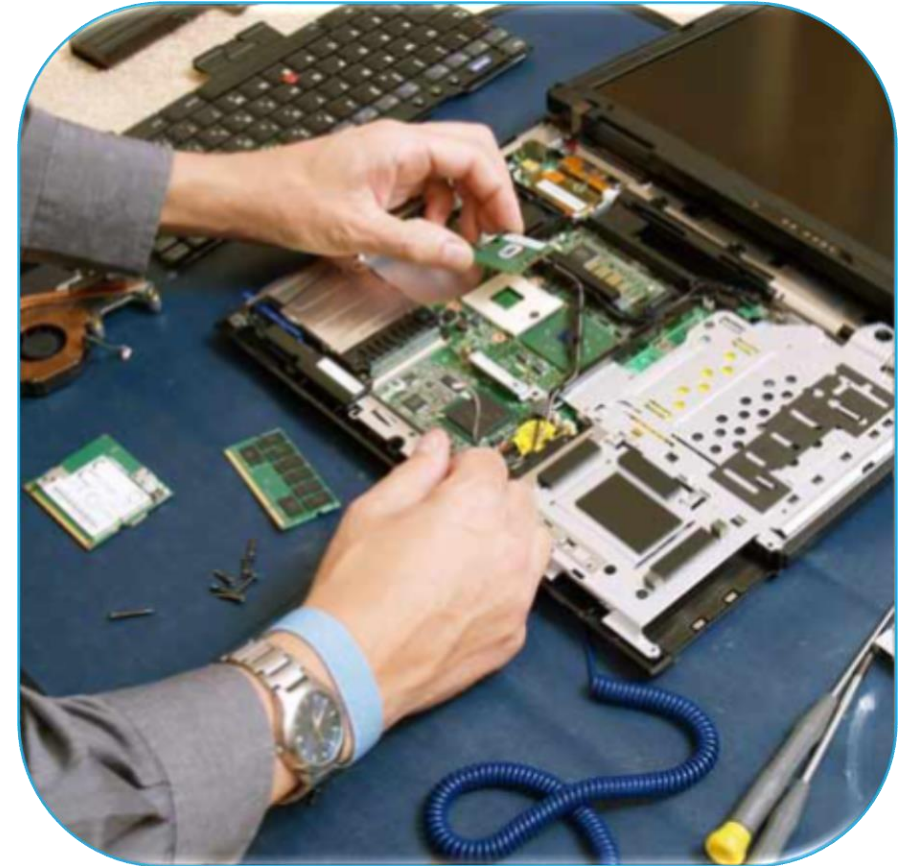
Preventive Maintenance Overview

- Preventive maintenance is implemented via a plan. While there are several considerations for preventive maintenance needs, preventive maintenance plans are developed based on at least two factors:

  - Computer location or environment - Computers that are exposed to dusty environments, such as those used on construction sites, as shown in the figure, require more attention than computers located in an office environment.

  - Computer use - High-traffic networks, such as a school network, might require additional scanning and removal of malicious software and unwanted files.

Preventive Maintenance Overview…

- To create a preventive maintenance plan, document the routine maintenance tasks that must be performed on the computer components and the frequency of each task. You can then use this list of tasks to create a maintenance program.

- Be proactive in computer maintenance and data protection. By performing regular maintenance routines, you can reduce potential hardware and software problems. Regular maintenance routines reduce computer downtime and repair costs.

Benefits of Preventive Maintenance

Preventive Maintenance Overview (Benefits)

- Regular preventive maintenance reduces;
  - potential hardware and software problems,
  - computer downtime,
  - repair costs,
  - and the number of equipment failures.
- It also improves;
  - data protection,
  - equipment life and stability,
  - and saves money.

Preventive Maintenance - Dust

Preventive Maintenance (Dealing with dust)

- The following are considerations to keep dust from damaging computer components:
  - Clean/replace building air filters regularly to reduce the amount of dust in the air.
  - Use a cloth or a duster to clean the outside of the computer case. If using a cleaning product, put a small amount onto a cleaning cloth and then wipe the outside of the case.
  - Dust on the outside of a computer can travel through cooling fans to the inside.
  - Accumulated dust prevents the flow of air and reduces the cooling of components.
  - Hot computer components are more likely to break down.
  - Remove dust from the inside of a computer using a combination of compressed air, a low-air-flow ESD vacuum cleaner, and a small lint-free cloth.
  - Keep the can of compressed air upright to prevent the fluid from leaking onto computer components.
  - Keep the compressed air can a safe distance from sensitive devices and components.
  - Use the lint-free cloth to remove any dust left behind on the component.

CAUTION

When you clean a fan with compressed air, hold the fan blades in place. This prevents overspinning the rotor or moving the fan in the wrong direction.

Preventive Maintenance – Internal Components

Preventive Maintenance - Internal Components

- This is a basic list of components to inspect for dust and damage:
  - CPU heat sink and fan assembly: The fan should spin freely, the fan power cable should be secure, and the fan should turn when the power is on.
  - RAM modules: The modules must be seated securely in the RAM slots. Ensure that the retaining clips are not loose.
  - Storage devices: All cables should be firmly connected. Check for loose, missing, or incorrectly set jumpers. A drive should not produce rattling, knocking, or grinding sounds.
  - Screws: A loose screw inside the case can cause a short circuit.
  - Adapter cards: Ensure that adapter cards are seated properly and secured with the retaining screws in their expansion slots. Loose cards can cause short circuits. Missing expansion slot covers can let dust, dirt, or living pests inside the computer.
  - Cables: Examine all cable connections. Ensure that pins are not bent or broken and that cables are not crimped, pinched, or severely bent. Retaining screws should be finger-tightened.
  - Power devices: Inspect power strips, surge suppressors (surge protectors), and UPS devices. Make sure the devices work properly and that there is clear ventilation.
  - Keyboard and mouse: Use compressed air to clean the keyboard, mouse, and mouse sensor.

Preventive Maintenance - Environmental Concerns

Preventive Maintenance - Environmental Concerns

- An optimal operating environment for a computer is clean, free of potential contaminants, and within the temperature and humidity ranges specified by the manufacturer.
- Follow these guidelines to help ensure optimal computer operating performance:
  - Do not obstruct vents or airflow to the internal components.
  - Keep the room temperature between 45 and 90 degrees Fahrenheit (between 7 and 32 degrees Celsius).
  - Keep the humidity level between 10% and 80%.
  - Temperature and humidity recommendations vary by computer manufacturer. Research the recommended values for computers used in extreme conditions.

CAUTION:

To avoid damaging computer surfaces, use a soft, lint-free cloth with an approved cleaning solution. Apply the cleaning solution to the lint-free cloth, not directly to the computer.

Preventive Maintenance - Software

Preventive Maintenance - Environmental Concerns

- Verify that installed software is current and follow the policies of the organization when installing security updates, operating system, and program updates.
- Create a software maintenance schedule to:
  - Review and install the appropriate security, software, and driver updates.
  - Update the virus definition files and scan for viruses and spyware.
  - Remove unwanted or unused programs.
  - Scan hard drives for errors and defragment non-SSD hard drives.
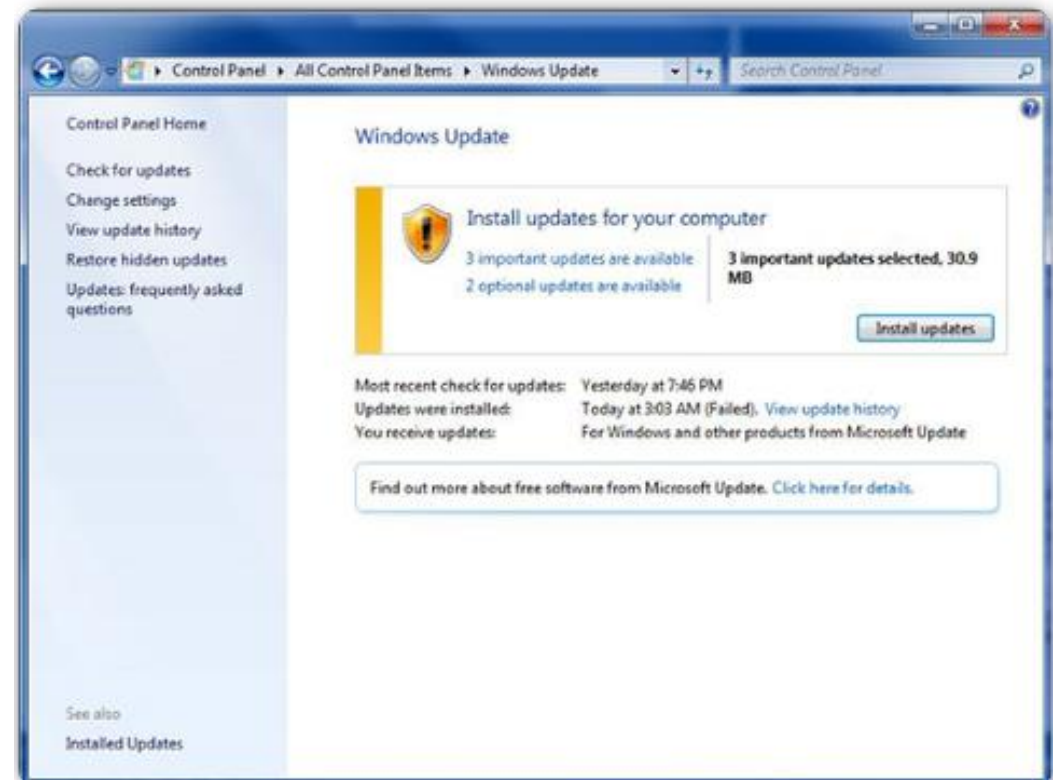
PC Troubleshooting

In this section, you will learn that to troubleshoot a problem quickly and effectively, you need to understand how to approach the issue. Troubleshooting is a way of discovering what is causing a problem and fixing it.

PC Troubleshooting
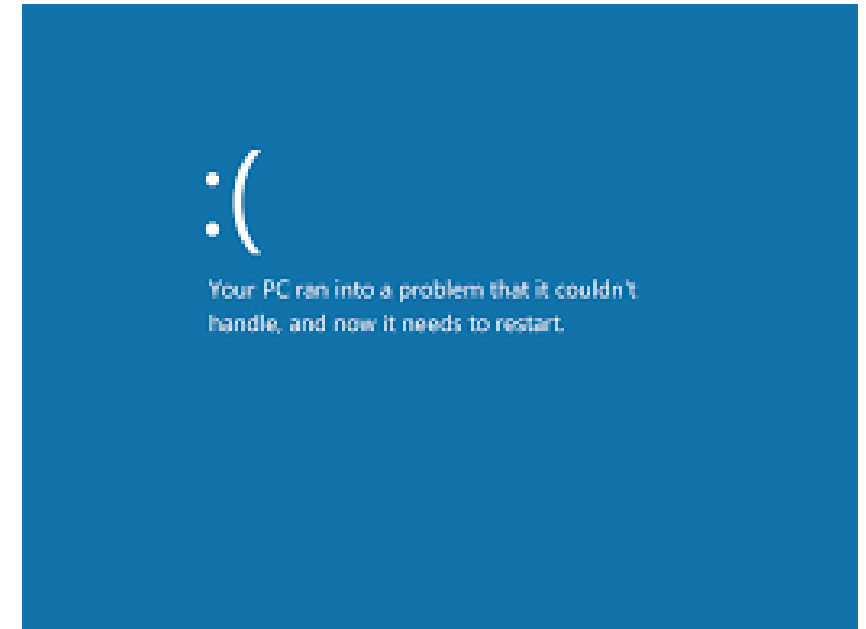
Introduction to Troubleshooting

- Troubleshooting is a systematic process used to locate the cause of a fault in a computer system and correct the relevant hardware and software issues.

- Approaching problem solving using a logical and methodical approach is essential to successful resolution.

- Although experience is very useful to problem solving, following a troubleshooting model will enhance effectiveness and speed.

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Your PC ran into a problem that it couldn't handle, and now it needs to restart.

Introduction to Troubleshooting…

- Troubleshooting requires an organized and logical approach to problems with computers and other components.
  - Sometimes issues arise during preventive maintenance.
  - At other times, customers may contact you with problems.
  - Taking a logical approach to troubleshooting allows you to eliminate variables and identify causes of problems in a systematic order.
  - Asking the right questions, testing the right hardware, and examining the right data helps you understand the problem and form a proposed solution.
- Troubleshooting is a skill that you refine over time.
  - Each time you solve a problem, you increase your troubleshooting skills by gaining more experience.
  - You learn how and when to combine steps, or skip steps, to reach a solution quickly. The troubleshooting process is a guideline that is modified to fit your needs.
- This section presents an approach to problem solving that you can apply to both hardware and software.
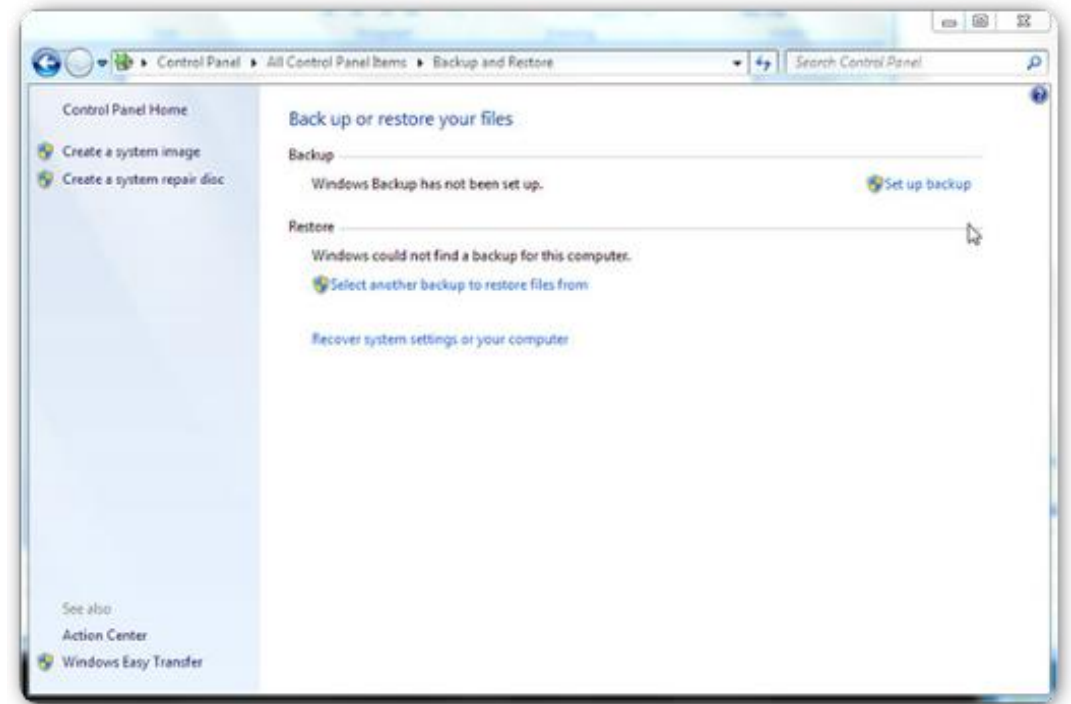
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Your PC ran into a problem that it couldn't handle, and now it needs to restart.

NOTE

The term customer, refers to any user who requires technical computer assistance.

Data Protection (Backup)

- Before you begin troubleshooting problems, always follow the necessary precautions to protect data on a computer.

- Some repairs, such as replacing a hard drive or reinstalling an operating system, might put the data on the computer at risk.

- Make sure you do everything possible to prevent data loss while attempting repairs.

- If your work results in data loss for the customer, you or your company could be held liable.

NOTE

The term customer, refers to any user who requires technical computer assistance.

Data Protection (Backup)…

- A data backup is a copy of the data on a computer hard drive that is saved to another storage device or to cloud storage.
  - Cloud storage is online storage that is accessed via the Internet.
- In an organization, backups may be performed on a daily, weekly, or monthly basis.
- If you are unsure about whether a backup has been done, do not attempt any troubleshooting activities until you check with the customer.
- Here is a list of items to verify with the customer regarding whether a backup has been performed:
  - Date of the last backup
  - Contents of the backup
  - Data integrity of the backup
  - Availability of all backup media for a data restore
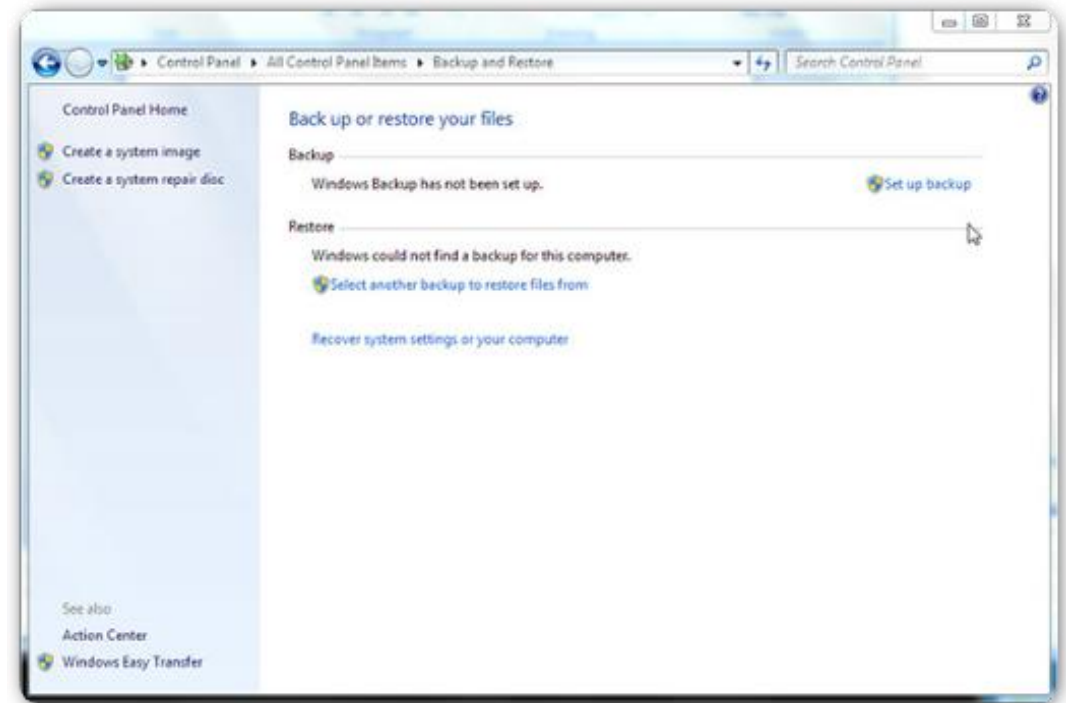
Data Protection (Backup)…

- If the customer does not have a current backup and you are not able to create one, ask the customer to sign a liability release form.

- A liability release form contains at least the following information:
  - Permission to work on the computer without having a current backup available
  - Release from liability if data is lost or corrupted
  - Description of the work to be performed

7. Customer Data. T he Client understands that in the process of working on their computer, there is a potential for the loss of data. The Client agrees that they have made the necessary backups of their data so that in the event of such a loss their data can be restored. The C omputer Technician will not be responsible for any loss of data.

PC Troubleshooting steps

PC Troubleshooting steps

- The troubleshooting process steps are as follows:

1) Interview the user and back up data before you make any changes to the system.

2) Examine the system, analyse the problem, and make an initial determination of what is the source of the problem.

3) Test your theory. If the theory is not confirmed, form another theory or escalate.

4) After you know the source of the problem, plan what to do to fix the problem and then fix it.

5) Verify the problem is fixed and that the system works. Take any preventive measures to make sure the problem doesn't happen again.

6) Document activities, outcomes, and what you learned.

Step 1: Interview the user and back up data

The first step in the troubleshooting process is to interview the user. During this step, gather as much information as possible from the customer and from the computer.

Conversation Etiquette

When you are talking to a customer, follow these guidelines:

- Ask direct questions to gather information.
- Do not use industry jargon.
- Do not talk down to the customer.
- Do not insult the customer.
- Do not accuse the customer of causing the problem.

By communicating effectively, you can elicit the most relevant information about the problem from the customer.

Customer Information	• Company Name • Contact Name • Address • Phone Number
Computer Configuration	• Manufacturer and Model • Operating System • Network Environment • Connection Type
Problem Description	• Open-ended Questions • Closed-ended Questions
Error Messages	
Beep Sequences	
LEDs	
POST	

Some of the important information to gather from the customer

Step 1: Interview the user and back up data…

Beep Codes

- Each BIOS manufacturer has a unique beep sequence, a combination of long and short beeps, for hardware failures. When troubleshooting, power on the computer and listen. As the system proceeds through the POST, most computers emit one beep to indicate that the system is booting properly. If there is an error, you might hear multiple beeps. Document the beep code sequence and research the code to determine the specific problem.

BIOS Information

- If the computer boots and stops after the POST, investigate the BIOS settings. A device might not be detected or configured properly. Refer to the motherboard documentation to ensure that the BIOS settings are correct.

Customer Information	• Company Name • Contact Name • Address • Phone Number
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Some of the important information to gather from the customer

Step 1: Interview the user and back up data…

Event Viewer

When system, user, or software errors occur on a computer running Windows, the Event Viewer is updated with information about the errors. The **Event Viewer,** records the following information about the problem:

- What problem occurred
- The date and time of the problem
- The severity of the problem
- The source of the problem
- The event ID number
- Which user was logged in when the problem occurred

Although the Event Viewer lists details about an error, you might need to further research the problem to determine a solution.
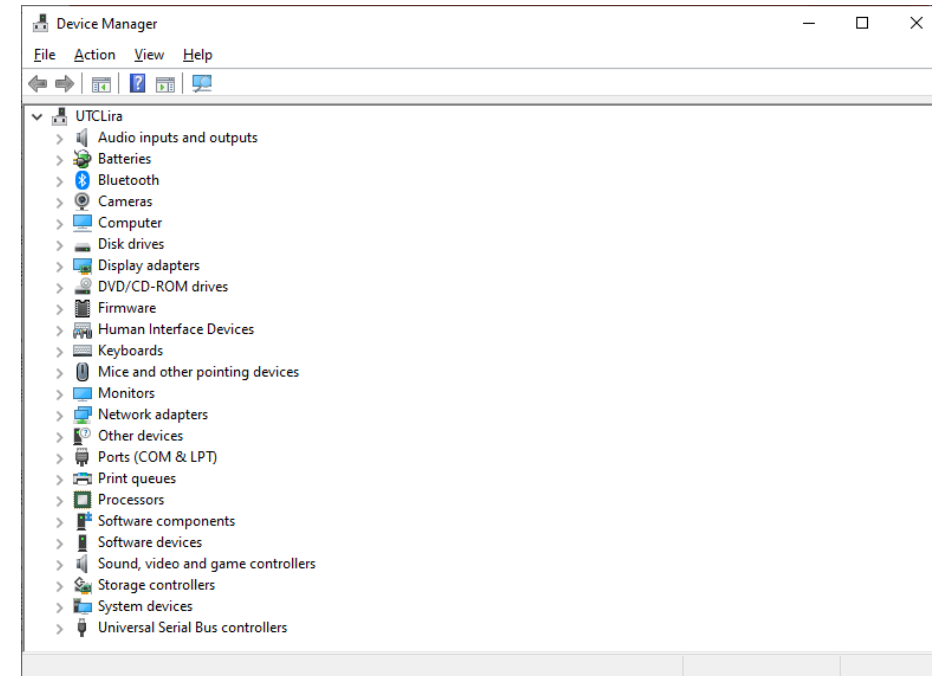
Step 1: Interview the user and back up data...

Device Manager

The Device Manager displays all the devices that are configured on a computer.

The operating system flags the devices that are not operating correctly with an error icon.

- A yellow triangle with an exclamation point indicates that the device is in a problem state.

- A red X means that the device is disabled or removed or that Windows can't locate the device.

- An downward-pointing arrow means the device has been disabled.

- A yellow question mark indicates that the system does not know which driver to install for the hardware.
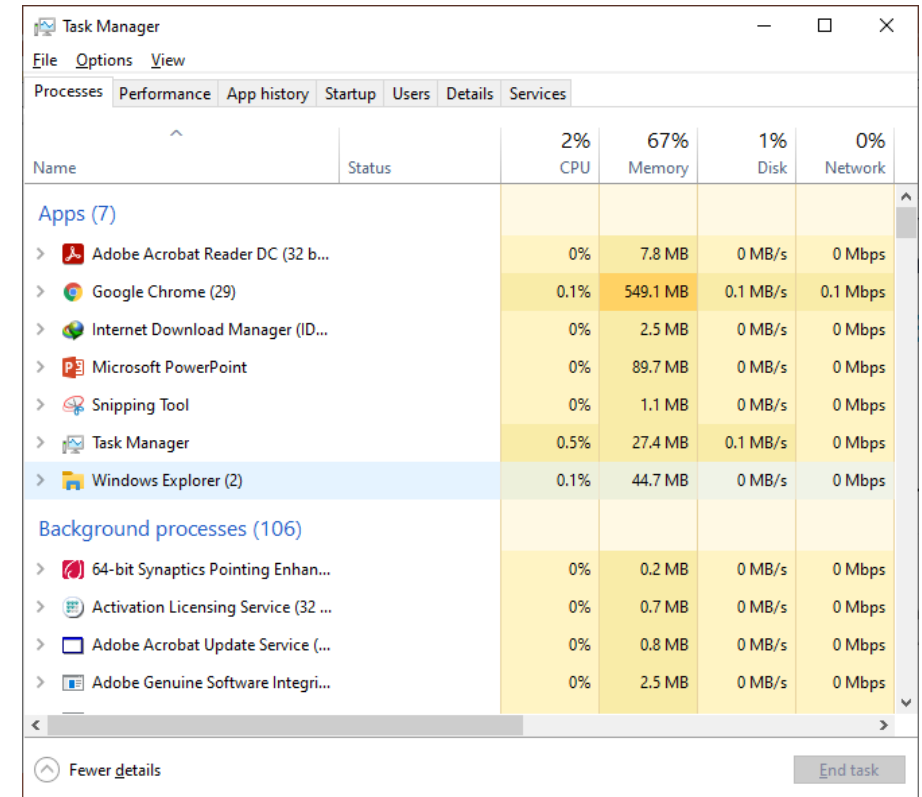
Step 1: Interview the user and back up data…

Task Manager

The Task Manager displays the applications and background processes that are currently running.

With the Task Manager, you can close applications that have stopped responding.

You can also monitor the performance of the CPU and virtual memory, view all processes that are currently running, and view information about the network connections.

Step 1: Interview the user and back up data…

Diagnostic Tools

Conduct research to determine what software is available to help diagnose and solve problems.

Many programs can help you troubleshoot hardware.

Manufacturers of system hardware usually provide diagnostic tools of their own. For instance, a hard drive manufacturer might provide a tool to boot the computer and diagnose why the hard drive does not start the operating system.
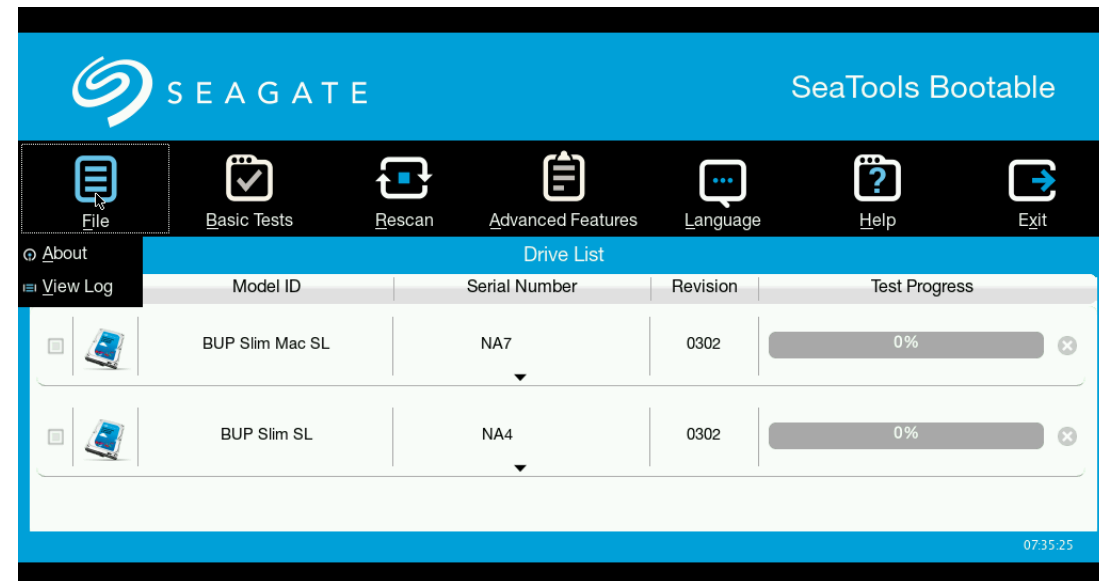
Step 2: Establish a theory

The second step in the troubleshooting process is to establish a theory of probable cause. First, create a list of the most common reasons for the error. Even if the customer thinks there is a major problem, start with the obvious issues before moving to more complex diagnoses, as outlined here:

- Check whether the device is powered off.
- Determine whether the power switch for an outlet is turned off.
- Check whether the surge protector is turned off.
- Ensure that there are no loose external cable connections.
- Check whether there is a non-bootable disk in the designated boot drive.
- Look for the incorrect boot order in the BIOS setup.

List the easiest or most obvious causes at the top. List the more complex causes at the bottom. If necessary, conduct internal (logs, journal) or external (internet) research based on the symptoms. The next steps of the troubleshooting process involve testing each possible cause.

Step 3: Test the Theory to Determine the Cause

You can determine an exact cause by testing your theories of probable causes one at a time, starting with the quickest and easiest. Some common steps to determine the cause of the problem are as follows:

- Ensure that the device is powered on.
- Ensure that the power switch for an outlet is turned on.
- Ensure that the surge protector is turned on.
- Ensure that external cable connections are secure.
- Ensure that the designated boot drive is bootable.
- Verify the boot order in the BIOS setup.

Step 3: Test the Theory to Determine the Cause…

Once the theory is confirmed, you can determine the steps to resolve the problem.

As you become more experienced at troubleshooting computers, you will work through the steps in the process faster.

For now, practice each step to better understand the troubleshooting process.

If you cannot determine the exact cause of a problem after testing all your theories, establish a new theory of probable cause and test it.

If necessary, escalate the problem to a technician with more experience.

- Before you escalate, document each test that you tried.

Step 4: Plan the fix and resolve the problem

After you have determined the exact cause of the problem, establish a plan of action to resolve the problem and implement the solution.

Divide large problems into smaller problems that can be analysed and solved individually. Prioritize solutions starting with the easiest and fastest to implement.

Create a list of possible solutions and implement them one at a time. If you implement a possible solution and it does not correct the problem, reverse the action you just took and then try another solution. Continue this process until you have found the appropriate solution

Sometimes quick procedures can correct the problem. If a quick procedure does correct the problem, verify full system functionality and, if applicable, implement preventive measures.

If a quick procedure does not correct the problem, research the problem further and then return to Step 2 to establish a new theory of the probable cause.

If no solution is achieved in the previous step, further research is needed to implement the solution.	• Helpdesk Repair Logs • Other Technicians • Manufacturer FAQs • Technical Websites • News Groups • Computer Manuals • Device Manuals • Online Forums • Internet Search

NOTE

Always consider corporate policies, procedures, and impacts before implementing any changes.

Step 5: Verify the fix and, if Applicable, Implement Preventive Measures

After the repairs to the computer have been completed, continue the troubleshooting process by verifying full system functionality and implementing the preventive measures needed, as outlined here:

- Reboot the computer.
- Ensure that multiple applications work properly.
- Verify network and Internet connections.
- Print a document from one application.
- Ensure that all attached devices work properly.
- Ensure that no error messages are received.

Verifying full system functionality confirms that you have solved the original problem and ensures that you have not created another problem while repairing the computer. Whenever possible, have the customer verify the solution and system functionality.

Step 6: Document Findings, Actions, and Outcomes

After the repairs to the computer have been completed, finish the troubleshooting process with the customer. Explain the problem and the solution to the customer verbally and in writing. The steps to take when you have finished a repair are as follows:

1) Discuss the solution implemented with the customer.
2) Have the customer verify that the problem has been solved.
3) Provide the customer with all paperwork.
4) Document the steps taken to solve the problem in the work order and in the technician's journal.
5) Document any components used in the repair.
6) Document the amount of time spent on resolving the problem.

Verify the solution with the customer. If the customer is available, demonstrate how the solution has corrected the computer problem. Have the customer test the solution and try to reproduce the problem. When the customer can verify that the problem has been resolved, you can complete the documentation for the repair in the work order and in your journal. Include the following information in the documentation:

- Description of the problem
- Steps to resolve the problem
- Components used in the repair

Common Problems and Solutions for PCs
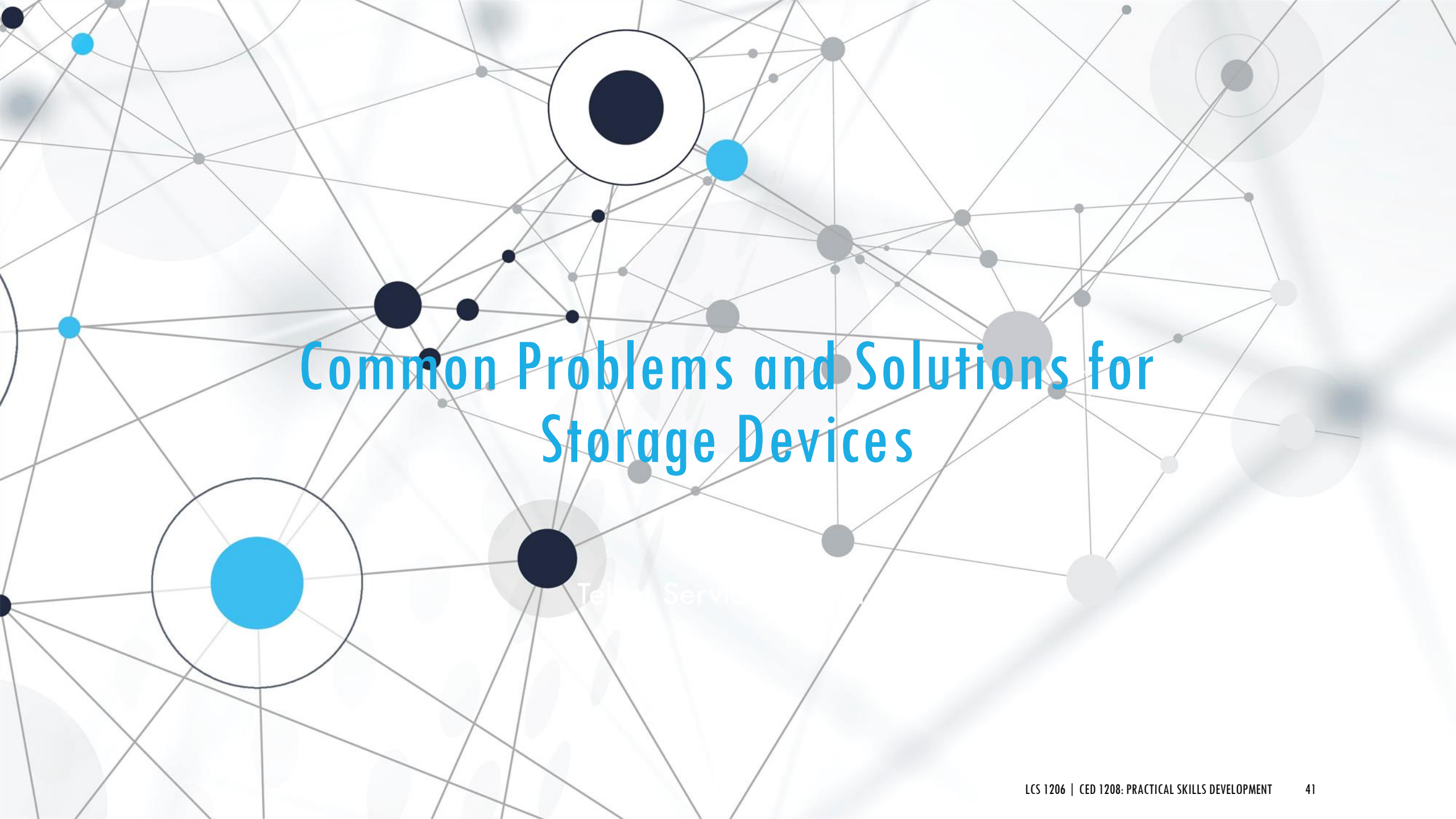
Common Problems and Solutions for PCs

As a technician, you will run into technical problems in your day-to-day routine that need your attention. As the issues arise, take the time to better understand the causes of problems and work through possible fixes. Be sure to document all that you do. This section discusses several common PC problems and suggested solutions.

Computer problems can be attributed to hardware, software, networks, or some combination of the three. You will resolve some types of problems more often than others.

Some common hardware problems are as follows:

- Storage device: Storage device problems are often related to loose or incorrect cable connections, incorrect drive and media formats, and incorrect jumper and BIOS settings.
- Motherboard and internal components: Motherboard and internal component problems are often caused by incorrect or loose cables, failed components, incorrect drivers, and corrupted updates.
- Power supply: Power problems are often caused by a faulty power supply, loose connections, and inadequate wattage.
- CPU and memory: Processor and memory problems are often caused by faulty installations, incorrect BIOS settings, inadequate cooling and ventilation, and compatibility issues.
- Displays: Display problems are often caused by incorrect settings, loose connections, and incorrect or corrupted drivers.

Common Problems and Solutions for Storage Devices

Common Problems and Solutions for Storage Devices

Identify the Problem	Probable Causes	Possible Solutions
The computer does not recognize a storage device.	The power cable is loose.	Secure the power cable.
	The data cable is loose.	Secure the data cable.
	The jumpers are set incorrectly.	Reset the jumpers.
	A storage device failed.	Replace the storage device.
	The disc is inserted upside down.	Insert the disc correctly.
	There is more than one disc inserted in the drive.	Ensure that there is only one disc inserted in the drive.

Common Problems and Solutions for Storage Devices…

The computer does not recognize an optical disc.	There is more than one disc inserted in the drive.	Ensure that there is only one disc inserted in the drive.
	The disc is damaged.	Replace the disc.
	A disc is the wrong format.	Use the correct type of disc.
	The optical drive is faulty.	Replace the optical drive.
	The optical drive is jammed.	Insert a pin in the small hole next to the eject button on the drive to open the drive.

Common Problems and Solutions for Storage Devices...
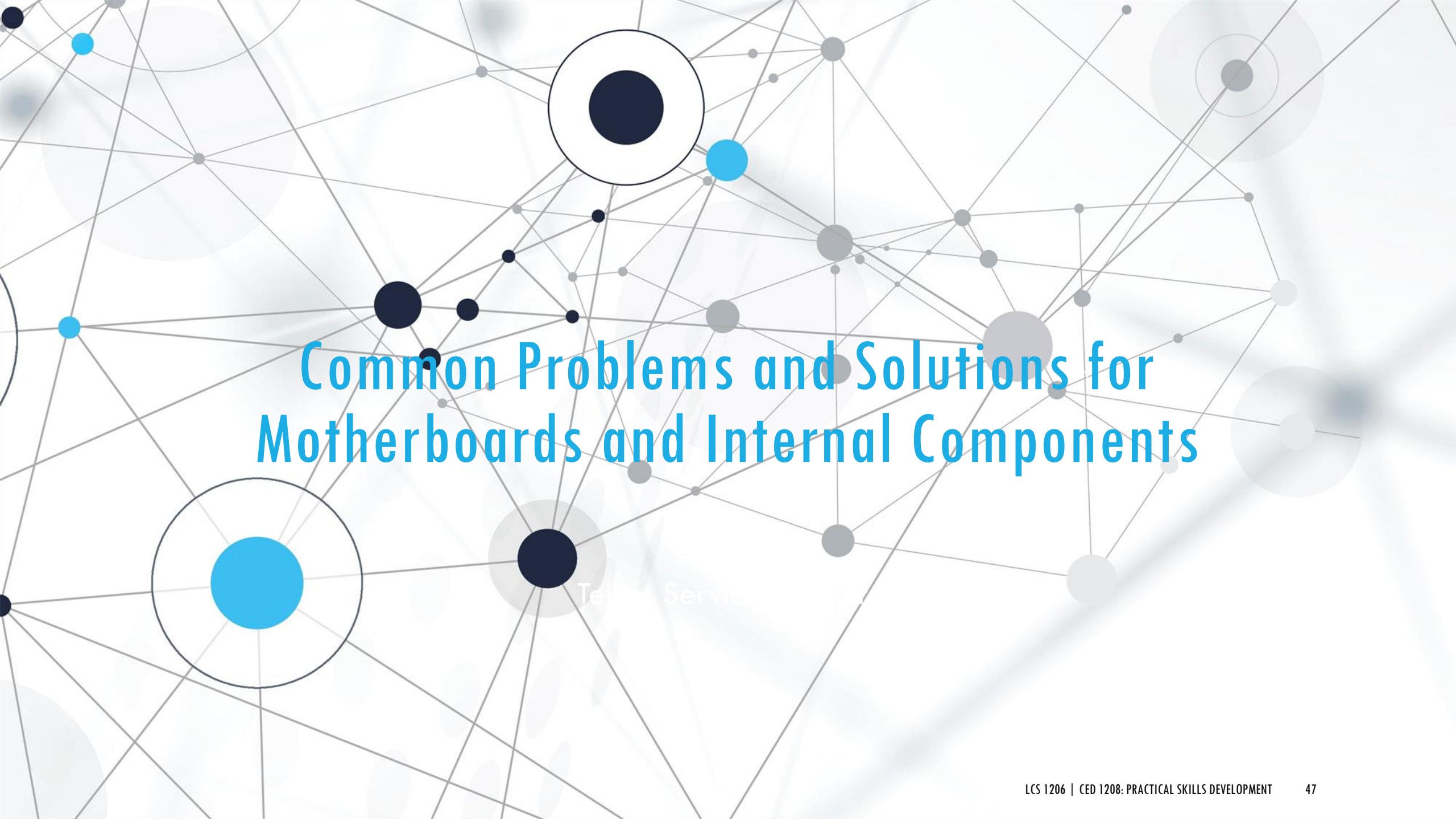
The computer will not eject an optical disc.	The optical drive has been locked by software.	Reboot the computer.
	The optical drive is faulty.	Replace the optical drive.
	The removable external drive cable is not seated properly.	Remove and re-insert the drive cable.

Common Problems and Solutions for Storage Devices...

The computer does not recognize a removable external drive.	The removable external drive cable is not seated properly.	Remove and re-insert the drive cable.
	The external ports are disabled in the BIOS settings.	Enable the ports in the BIOS settings.
	The removable external drive is faulty.	Replace the removable external drive.

Common Problems and Solutions for Storage Devices...

A media reader cannot read a memory card that works properly.	The media reader does not support the memory card type.	Use a different memory card type.
	The media reader is not connected correctly.	Ensure that the media reader is connected correctly in the computer.
	The media reader is not configured properly in the BIOS settings.	Reconfigure the media reader in the BIOS settings.
	The media reader is faulty.	Install a known good media reader.
Retrieving or saving data from the USB flash drive is slow.	The motherboard does not support USB 3.0 or 3.1.	Replace the motherboard with a USB 3.0-capable motherboard or add a USB 3.0 expansion card.
	The USB Flash drive might be connected to a USB port rated slower or not configured properly.	The port is set to full speed in the BIOS settings.

Common Problems and Solutions for Motherboards and Internal Components

Common Problems and Solutions for Motherboards and Internal Components

Identify the Problem	Probable Causes	Possible Solutions
The clock on the computer is no longer keeping the correct time or the BIOS settings are changing when the computer is rebooted.	The CMOS battery may be loose.	Secure the battery.
	The CMOS battery may be drained.	Replace the battery.
After updating the BIOS firmware, the computer will not start.	The BIOS firmware update did not install correctly.	Contact the motherboard manufacturer to obtain a new BIOS chip. (If the motherboard has two BIOS chips, the second BIOS chip can be used.) Follow proper procedures for a BIOS recovery

Common Problems and Solutions for Motherboards and Internal Components...

The computer displays incorrect CPU information when the computer boots.	The CPU settings are not correct in the advanced BIOS settings.	Set the advanced BIOS settings correctly for the CPU.
	BIOS does not properly recognize the CPU.	Update the BIOS.

Common Problems and Solutions for Motherboards and Internal Components...

The computer displays incorrect CPU information when the computer boots.	The CPU settings are not correct in the advanced BIOS settings.	Set the advanced BIOS settings correctly for the CPU.
	BIOS does not properly recognize the CPU.	Update the BIOS.

Common Problems and Solutions for Motherboards and Internal Components...

The hard drive LED on the front of the computer does not light.	The hard drive LED cable is not connected or is loose.	Reconnect the hard drive LED cable to the motherboard.
	The hard drive LED cable is incorrectly oriented to the front case panel connections.	Correctly orient the hard drive LED cable to the front case panel connection and reconnect it.

Common Problems and Solutions for Motherboards and Internal Components...

The built-in NIC has stopped working.	The NIC hardware has failed.	Add a new NIC to an open expansion slot.

The computer does not display any video after a new PCIe video card is installed.	BIOS settings are set to use the built-in video.	Disable the built-in video in the BIOS settings.
	The monitor cable is still connected to the built-in video.	Connect the monitor cable to the new video card.
	The new video card needs auxiliary power.	Connect any required power connectors to the video card.
	The new video card is faulty.	Install a known good video card.

Common Problems and Solutions for Motherboards and Internal Components...

The new sound card does not work.	The speakers are not connected to the correct jack.	Connect the speakers to the correct jack.
	The audio is muted.	Unmute the audio.
	The sound card is faulty.	Install a known good sound card.
	BIOS settings are set to use the on-board sound device.	Disable the on-board audio device in the BIOS settings.

Common Problems and Solutions for Motherboards and Internal Components...

System attempts to boot to an incorrect device.	Media was left in a removable drive.	Check that the removable drives do not contain media that is interfering with the boot process and ensure that the boot order is configured correctly.
	Boot order configured incorrectly.	Check that the removable drives do not contain media that is interfering with the boot process and ensure that the boot order is configured correctly.

Common Problems and Solutions for Motherboards and Internal Components…

User can hear fans spinning, but the computer does not start, and there are no beeps from the speaker.	POST procedure is not executing.	Faulty cabling or damaged or mis-seated CPU or other motherboard component needs to be replaced.

Motherboard capacitors are distended, swollen, emitting residue, or bulging.	Damage has occurred due to heat, ESP, power surge, or spike.	Replace the motherboard.

Common Problems and Solutions for Power Supplies

Common Problems and Solutions for Power Supplies

Identify the Problem	Probable Causes	Possible Solutions
The computer will not turn on.	The computer is not plugged into the AC outlet.	Plug the computer into a known good AC outlet.
	The AC outlet is faulty.	Plug the computer into a known good AC outlet.
	The power cord is faulty.	Use a known good power cord.
	The power supply switch is not turned on.	Turn on the power supply switch.
	The power supply switch is set to the incorrect voltage.	Set the power supply switch to the correct voltage setting.
	The power button is not connected correctly to the front panel connector.	Correctly orient the power button to the front case panel connector and reconnect.
	The power supply has failed.	Install a known good power supply.

Common Problems and Solutions for Power Supplies...

The computer reboots and turns off unexpectedly; or there is smoke or the smell of burning electronics.	The power supply is starting to fail.	Replace the power supply.

Common Problems and Solutions for CPUs and Memory

Common Problems and Solutions for CPUs and Memory

Identify the Problem	Probable Causes	Possible Solutions
The computer will not boot or it locks up.	The CPU has overheated.	Reinstall the CPU.
	The CPU fan is failing.	Replace the CPU fan.
	The CPU has failed.	Add fan(s) to the case. Replace the CPU fan. Replace the CPU.

The CPU fan is making an unusual noise.	The CPU fan is failing.	Replace the CPU fan.
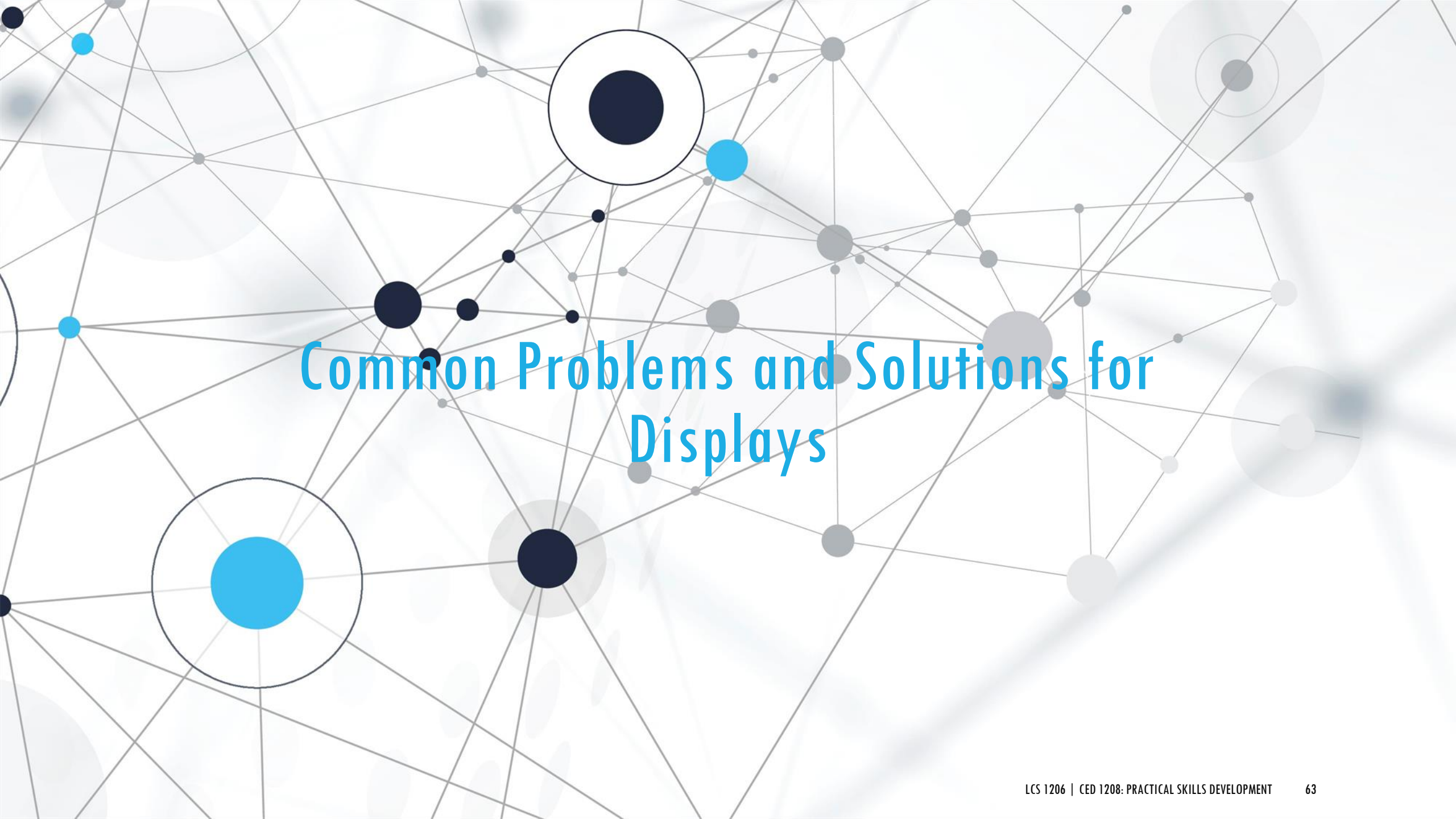
Common Problems and Solutions for CPUs and Memory...

The computer reboots without warning, locks up, or displays error messages.	The front-side bus is set too high.	Reset to the factory default settings for the motherboard.
		Lower the front-side bus settings.
	The CPU multiplier is set too high.	Lower the multiplier settings.
	The CPU voltage is set too high.	Lower the CPU voltage settings.

After upgrading from a single-core CPU to a dual-core CPU, the computer runs more slowly and shows only one CPU graph in the Task Manager.	The BIOS does not recognize the dual-core CPU.	Update the BIOS firmware to support the dual-core CPU.

Common Problems and Solutions for CPUs and Memory...

The computer does not recognize the RAM that was added.	The new RAM is faulty.	Replace the RAM.
	The incorrect type of RAM was installed.	Install the correct type of RAM.
	The RAM that has been added is not the same type of RAM that was already installed.	Install the correct type of RAM.
	The new RAM is loose in the memory slot.	Secure the RAM in the memory slot.

After upgrading Windows, the computer runs very slowly.	The computer does not have enough RAM.	Install additional RAM.
	The video card does not have enough memory.	Install a video card that has more memory.

Common Problems and Solutions for Displays

Common Problems and Solutions for Displays

Identify the Problem	Probable Causes	Possible Solutions
Display has power but no image on the screen.	The video cable is loose or damaged.	Reconnect or replace the video cable.
	The computer is not sending a video signal to the external display.	Use the Fn key along with the multi-purpose key to toggle to the external display.

The display is flickering.	Images on the screen are not refreshing fast enough.	Adjust the screen refresh rate.
	The display inverter is damaged or malfunctioning.	Disassemble the display unit and replace the inverter.

Common Problems and Solutions for Displays…

The image on the display looks dim.	The LCD backlight is not properly adjusted.	Check the repair manual for instructions about calibrating the LCD backlight. Adjust the LCD backlight properly.
Pixels on the screen are dead or not generating colour.	Power to the pixels has been cut off.	Contact the manufacturer.
The image on the screen appears to flash lines or patterns of different colour and size (artefacts).	The display is not properly connected.	Disassemble the display and check the connections.
	The GPU is overheating.	Disassemble and clean the computer, checking for dust and debris.
	The GPU is faulty or malfunctioning.	Replace the GPU.

Common Problems and Solutions for Displays…

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Pixels on the screen are dead or not generating colour.	Power to the pixels has been cut off.	Contact the manufacturer.
The image on the screen appears to flash lines or patterns of different colour and size (artefacts).	The display is not properly connected.	Disassemble the display and check the connections.
	The GPU is overheating.	Disassemble and clean the computer, checking for dust and debris.
	The GPU is faulty or malfunctioning.	Replace the GPU.

Common Problems and Solutions for Displays...

Colour patterns on a screen are incorrect.	The display is not properly connected.	Disassemble the display and check the connections.
	The GPU is overheating.	Disassemble and clean the computer, checking for dust and debris.
	The GPU is faulty or malfunctioning.	Replace the GPU.
Images on a display screen are distorted.	Display settings have been changed.	Restore the display settings to the original factory settings.
	The display is not properly connected.	Disassemble the display to a point where you can check the display connections.
	The GPU is overheating.	Disassemble and clean the computer, checking for dust and debris.
	The GPU is faulty or malfunctioning.	Replace the GPU.

Common Problems and Solutions for Displays…

The display has a "ghost" image.	The display is experiencing burn-in.	Power off the display and unplug it from the power source for a few hours.
		Use the degauss feature, if it is available.
		Replace the display.
The images on the display have distorted geometry.	The driver has become corrupted.	Update or reinstall the driver in safe mode.
	The display settings are incorrect.	Use the display's settings to correct the geometry.
The monitor has oversized images and icons.	The driver has become corrupted.	Update or reinstall the driver in safe mode.
	The display settings are incorrect.	Use the display's settings to correct the geometry.

Common Problems and Solutions for Displays...

The projector overheats and shuts down.	The fan has failed.	Replace the fan.
	The vents are clogged.	Clean the vents.
	The projector is in an enclosure.	Remove the enclosure or ensure proper ventilation.
In a multiple-monitor setup, the displays are not aligned or are incorrectly oriented.	The settings for multiple monitors are not correct.	Use the display control panel to identify each display and set the alignment and orientation.
	The driver has become corrupted.	Update or reinstall the driver in safe mode.
The display is in VGA mode.	The computer is in safe mode.	Reboot the computer.
	The driver has become corrupted.	Update or reinstall the driver in safe mode.

END OF LECTURE (Any Questions?)

Thank you for listening.

NEXT Lecture: PC Hardware Categories