



# COMPUTER SYSTEM TROUBLESHOOTING

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**Troubleshooting** is the process of identifying, analyzing and resolving problems or issues that occur in a system, device, software or equipment.

The purpose of troubleshooting is to fix the identified problems.



# ASPECTS OF TROUBLESHOOTING



1. Problem identification
2. Root cause analysis
3. Isolating and testing
4. Solution implementation
5. Verification
6. documentation



# TYPES OF TROUBLESHOOTING

The common categories of troubleshooting:

- a. Hardware troubleshooting
- b. Software troubleshooting
- c. Performance troubleshooting
- d. Electrical troubleshooting



# A: HARDWARE TROUBLESHOOTING



**Hardware troubleshooting** involves diagnosing and fixing issues related to computer hardware components such as motherboard, memory, graphic card, hard drive, peripherals like printers, scanners



# 1. Booting Failure

Booting is the process of starting a computer

If the power button does not initialize

- a) Inspect the power cord
- b) Make sure the outlet connecting to it is functional
- c) When a computer is connected to a surge protector, check if it is switched on
- d) If problem occurs on laptop the battery might be depleted, connect the AC adapter to a wall socket





## 2. Application slowness

When application is running slowly,

a) Close and restart the application

Or

b) Close all running applications



### 3. Frozen or stuck application

#### For window OS

- a) Press and hold the CTRL, ALT and DELETE KEYS simultaneously to open task manager
- b) Locate the unresponsive application
- c) Select the unresponsive application by clicking on it
- d) Click “END TASK” to force selected application to close



A small portion of the Tanzanian flag is visible in the top left corner, showing the green, black, and blue diagonal stripes.

## For Mac OS

- a) Press and hold the command Option and ESC KEYS simultaneously, The “FORCE QUIT APPLICATION” window will appear
- b) Select the unresponsive application
- c) Click the “Force Quit” button to close it



## 4. Slowly running applications

- a) Perform a virus scan
- b) Attempt free up space by removing unnecessary files or programs
- c) Utilize disk defragmenter

## 5. Keyboard and mouse problems

a) Check connections

*for wired devices unplug and reconnect, for wireless check batteries and USB receiver*

b) Try on another

c) Check device manager

d) Check for dirt or damage



## 6. Frozen computer

- a) Reboot the computer by press and hold **ctrl + alt + delete** on the keyboard to access task manager
- b) If no response, hold the power button for 5-10 second to force a shutdown and restart computer
- c) Check for overheating
- d) Run a system scan



Task Manager

Type a name, publisher, or PID...

Processes

Run new taskEnd taskEfficiency mode

| Name                              | Status | 56% CPU | 59% Memory | 1% Disk  | 0% Network |
|-----------------------------------|--------|---------|------------|----------|------------|
| Apps (6)                          |        |         |            |          |            |
| > Media Player (2)                |        | 0%      | 51.4 MB    | 0.1 MB/s | 0 Mbps     |
| > Microsoft Edge (12)             |        | 0%      | 73.8 MB    | 0 MB/s   | 0 Mbps     |
| > Microsoft PowerPoint            |        | 2.5%    | 101.5 MB   | 0 MB/s   | 0 Mbps     |
| > SnippingTool.exe                |        | 2.5%    | 17.5 MB    | 0.1 MB/s | 0 Mbps     |
| > Task Manager                    |        | 22.8%   | 60.2 MB    | 0 MB/s   | 0 Mbps     |
| > Windows Explorer (4)            |        | 2.5%    | 48.9 MB    | 0.1 MB/s | 0 Mbps     |
| Background processes (91)         |        |         |            |          |            |
| Adobe CEF Helper (32 bit)         |        | 0%      | 0.3 MB     | 0 MB/s   | 0 Mbps     |
| Adobe CEF Helper (32 bit)         |        | 0%      | 0.3 MB     | 0 MB/s   | 0 Mbps     |
| Adobe Creative Cloud (32 bit)     |        | 0%      | 3.7 MB     | 0.1 MB/s | 0 Mbps     |
| > Adobe Genuine Software Inte...  |        | 0%      | 2.0 MB     | 0 MB/s   | 0 Mbps     |
| > Adobe Genuine Software Servi... |        | 0%      | 0.7 MB     | 0 MB/s   | 0 Mbps     |
| Adobe IPC Broker (32 bit)         |        | 0%      | 1.4 MB     | 0 MB/s   | 0 Mbps     |
| > Adobe Update Service (32 bit)   |        | 0%      | 0.3 MB     | 0 MB/s   | 0 Mbps     |







## 7. Sound problems

- i. Verify volume level by click the audio button located either top-right or bottom-right corner.
- ii. Check connections
- iii. Right click speak icon--→sound setting-→output device
- iv. Update or reinstall audio drivers
- v. Check BIOS audio setting *if sound card disabled*





## 8. Black screen

- a) The computer might be in sleep mode, *activate it by clicking mouse or pressing any key on a keyboard*
- b) Check monitor power and cable
- c) Try another monitor or cable
- d) Listen for beeps or fan sounds if the computer is running but no display it may be
  - a) Loose RAM graphics card, reseal both
- e) Boot into safe mode



## 9. Monitor problems

- a) Check power cable and indicator light
- b) ensure correct input source (HDMI or VGA, Display Port)
- c) Test with another computer to isolate the issue
- d) Inspect cable to damage
- e) Adjust brightness/ contrast setting or reset monitor to factory defaults



## B. SOFTWARE TROUBLESHOOTING

**Computer software troubleshooting** is a systematic process that involves identifying, isolating and resolving issues with computer software.

Common software problems:



### 1. Software bugs

The software may have programming errors or defeats that cause it to behave unexpectedly or crash

### 2. Compatibility issues

The software may not be compatible with the operating system, hardware or other software components

### 3. Configuration problems

Incorrect settings or configuration can lead to software issues

### 4. Data corruption

Corrupted or invalid data can cause software malfunctions

### 5. Resource constraints

Insufficient system resource such as memory or disk space



# METHODS TO SOLVE SOFTWARE PROBLEMS



1. Update software
2. Disable or uninstall recently installed software
3. Scan for malware
4. Inspect hardware
5. Use safe mode
6. Reinstall software



## C: PERFORMANCE TROUBLESHOOTING



**Performance troubleshooting** is the process of identifying and resolving problems that are causing a computer to run slowly or inefficiently





# STEPS IN COMPUTER PERFORMANCE TROUBLESHOOTING



1. Identify symptoms
2. Checking hardware
3. Checking monitoring resource usage
4. Cleaning and maintenance
5. Software updates
6. Malware and virus scans
7. Startups programs
8. Software optimization
9. Hardware upgrades
10. Data backup

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## D. ELECTRICAL TROUBLESHOOTING

**Electrical troubleshooting** is the process of identifying and resolving problems or faults in electrical systems, circuits devices or equipment.

This involves identifying and fixing electrical problem in various systems such as power supply issues, circuit overloads and electrical component failures.