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Thread: [\[TUT\]Hardware Troubleshooting and Repair \[TUT\]](#)

OnlineSpartan - May 25, 2013, 10:42 am

Welcome to my tutorial on how to troubleshoot and repair your system. I also have this tutorial in PDF form, but for those without time, I will break this up the best I can into 2 parts ? .

Part I: Hardware

In order to successfully troubleshoot hardware on a PC, one needs to understand the basic functions of a PC. Just as a car has certain parts that have their own individual function, yet work together, inside of a PC. Understanding the individual functions of these parts will help you diagnose and come up with theories/solutions where you should begin to quickly resolve the issue(s).

PSU:

The Power Supply Unit is a box that gives power to the computer. It converts the AC (Alternating Current) from the outlet to the DC (Direct Current) the computer needs to function. When a PC won't physically turn on, 9 times out of 10, this is the issue.

Common symptoms of failure:Unit won't turn on.

No lights when power button is pressed.

Unit turns on for a few seconds and cuts off (can also be motherboard)

Reboots randomly (Check Motherboard as well.)

Motherboard

The motherboard is similar to the human central nervous system. It's primary purpose is to carry the signals to the various devices on the PC. Usually, it's wise to see if the PC is under warranty to send back to the manufacturer for repair or diagnose to determine if it is worth the cost replacing.

Laptop motherboard replacements can range from \$80-300 depending on availability if it's still being produced.If the laptop in question is 3-4 years old and you determine the motherboard blew out, it is safe to assume that you are usually better off either getting another laptop and save yourself the trouble. However, desktop PC motherboards nowadays usually range for 60-100 for office grade parts.

Common symptoms of failure:Unit doesn't recognize devices after they have been replaced.

No video on screen.

Unit has blown capacitors. See below.

Blue Screen of Death

Unit reboots spontaneously.

Unit shuts off after 20-40 seconds or intensive tasks (overheating CPU).

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*If the motherboard appears to have blown capacitors, it is a sign to replace it. It is an indication that a surge has been present and it has damaged the board. It may seem functional, but may be the cause of BSOD (Blue screen of death), or numerous other issues.

HDD (Hard Disk Drive)

The hard disk drive or HDD as it is referred to as a component that stores information on it. The data is magnetically stored either on a:

A: Revolving Platter(s) with an arm that read/writes data.

B: New solid state drives (SSD) that operate similarly to a flash drive. Smaller, more expensive, yet has faster data retrieval.

This happens to be one of the most frequently replaced parts as well in my opinion. This is probably due to the moving platters that wear out over time (Not applicable for SSD).

Pic of HDD With SATA on bottom, PATA on top.

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A HDD replacement can be easy or hard depending on your skill level and is usually not universal apart from the 4 screws that hold the rail or occasional foam pads that minimize vibration and the cables that it connects up to. The best option is to visit your manufacturer and go under support/downloads to download the "Service Manual" to see specifically how to remove that type of HDD.

Symptoms of a failing HDD "No OS Found" error

Unit will not boot to Windows, tries to constantly "Repair"/Chkdsk.

Unit will not boot to other partitions. Ex. Recovery Partition.

Physical clicking noise heard with 1 or more above symptoms present.

Blinking cursor on a black screen after splash screen loads.

No HDD present under BIOS settings.

*IF unit tries to consistently repair, a format may be in order before ruling out HDD.

Diagnostics for HDD

To diagnose the HDD, the best thing to do is run a diagnostic. With newer based PC's that have Windows Vista/Windows 7; F10, F12, "Press ESC for Startup Menu" are common keys to press depending on the manufacturer.

You would want to look for a "Diagnostic" option with "Express Testing" option afterwards. If this fails, then the HDD may very well be out of service. It will need to be replaced. I would consult your

manual as to how to replace it or the product support site as each model varies placement of the HDD. However, not all models will have a built-in diagnostic option. Third party tools may be needed such as Seagate tools or Eurosoft diagnostics.

RAM (Random Access Memory)

RAM, or the full name, RANDOM ACCESS MEMORY, is the memory of the computer. There has been a few times when this went out and caused a headache for me to diagnose. There are some pretty common symptoms causing this, however they can be symptoms that cross with other parts of the PC.

Desktop RAM on left, Laptop RAM on right.

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Symptoms of Failing RAM:BSOD (requires Diagnostic).

Replaced HDD first, OS still doesn't load.

Unit locks up when opening up various programs.

Beep codes (Check with manufacturer).

No video (Reseat memory by taking out and putting back in, not necessarily failing)

BSOD (Blue Screen of death)

The "Blue Screen of Death" can be tough to diagnose at times as it usually just indicated a serious error. It is just a generic page for something went terribly wrong. The Blue Screen can mean a couple things and usually leaves a hint sometimes of what went wrong. Here are a few examples:

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IRQL_NO_LESS_OR_EQUAL

In my experience, this usually led to one of two things:

1. Memory is failing. This would require a diagnostic. Go under the "Diagnostic" section to learn more.

2. Something tried accessing the same memory resources at the same time.

This is usually a no-no as it creates a tug of war and causes errors. What might cause this? Say you have two pieces of antivirus software installed, AV "A" and AV "B", on the computer.

IF "A" starts running a scan and starts searching in areas that "B" is looking in also, this will cause problems as both of the programs are trying to access the same resource at the same time.

Sometimes it will cause a bottleneck and slow down the PC, other times it will spit out a BSOD error.

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This BSOD error looks similar to one we encountered earlier. This time it has DRIVER as a cause of a problem. This BSOD tends to occur when:

1. A new device is installed and incorrect or outdated driver is installed.
2. A driver is updated, whether manually or through Windows updates and it becomes corrupted.
3. Sometimes it tells you what is causing the issue. Look at line: gv3.sys – Address etc. **

It tells us that gv3.sys had a problem and it caused a BSOD. What is gv3.sys? According to

Microsoft, it is a processor driver. Will you get the same error? Probably not, but this should be used as an example rather than a solution. Knowing what to look for in a BSOD message can help in researching the problem.

There are a lot of BSOD error messages out there and some can be caused by failing hardware. If a BSOD message occurs, try to do the following:

Look for the cause in the top of the page shown in the examples above.

Try to find the file in question.

Run hardware diagnostic.

Perform research on the issue, Use resources such as Google to help find responses to the Blue screen cause.

A helpful tool in diagnosing BSOD errors I came across is BlueScreenView. It can be found at http://nirsoft.net/utils/blue_screen_view.html

Scroll down to the bottom of the download page and look for the download link as shown above. Program doesn't need to be installed; it just runs when you click on the .exe

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Right click->Properties allows for a more detailed view of the dump and an explanation of what might have gone wrong.

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This is an example of what the "Property" option displays. It goes into more details of when the error occurred and which process had issues.

Diagnostic Testing

Computers can sometimes go haywire or goofy and it can be hard to pinpoint what is the cause of the issue. Hardware diagnostics check the physical components to be sure that they do not need to be replaced and helps narrow down issues from hardware to software. Certain systems such as Dell utility partition already have integrated diagnostic software available when accessed through boot options.

Nowadays everything is being added onto partitions to make life easier and assist in troubleshooting over the phone. If the computer is between 1-3 years old, chances are that it has some sort of software to assist in diagnosing a hardware issue. This is not to say that there aren't third party pieces of software that can diagnose issues as well.

Common free diagnostic tools are:

Memtest86: A tool used for testing RAM memory modules.

Memtest86+: Another variant of Memtest86. Contains additional readouts.

DFT: (Drive Fitness Test): Used to test hard drive. SATA/PATA compatible; cannot diagnose a HDD 3TB or higher.

Keep in mind, using these tools can require some advanced skill and booting to the disc or discs. It can get a bit hairy if you are relatively new to this, but I can lead you in the right direction as there are a lot of ways to approach this subject.

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This is how Memtest running looks like, when it has errors an error count will let you know as well as a list. Memtest86+ has a similar screen and displays a RED area for errors (if any). A good run time for RAM testing is about 3+ hours.

DFT from Hitachi (has ISO image available for burning)

This is how the DFT program should appear after it boots off the CD correctly:

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Option 1 + 2 are similar as they support newer and older drives, but option 2 goes way back with SCSI chains. If you maybe confused, just go with default option 1.

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If you do not see any drives at all, there may be a physical problem with you hardware. I would recheck the connections inside your computer and read up on the HDD. Otherwise press "Enter" for "YES" and you will be presented with a screen to choose the test type.

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Press "Enter" or Left/Right arrow keys to choose the options that appear in teal color. If you have time, I recommend you choose the "Advanced Test" option as it is more thorough. If any errors occur, DFT will notify you. Errors mean that the HDD may be physically failing and will need to be replaced.

THIS CONCLUDES THE TUT!! COMING SOON...PART 2 (COMMON ERRORS AND SOFTWARE MAINTENANCE) SAY THANKS IF YOU LEARNED SOMETHING, PM ME FOR INFO OR THE PDF FORM. THANKS!! ??

Gustav - May 25, 2013, 10:53 am

[This](#) would be the appropriate section for this thread.

I'm currently reading it man.

Corso - May 25, 2013, 12:52 pm

Not a bad guide man, quite informative ! +1 for it !

OnlineSpartan - May 25, 2013, 1:30 pm

(May 25, 2013 12:52 PM)Corso Wrote: [CITE](#) Not a bad guide man, quite informative ! +1 for it !
Thanks good sir!! I will be working on the second part as well ;)

Gustav - May 25, 2013, 1:51 pm

Forgot to update it was done reading it a while ago, and i have to say this is a very good guide man. keep it up.

Judecca - May 25, 2013, 3:09 pm

This'll serve me well considering my computer is unstable for the most part. Thank you very much

