



Computer Maintenance

This CNETC Training was Prepared and Presented By:
Cody Christensen



Introduction:

As computers are used, over time they accumulate programs, files, and settings that may be undesirable. Some system files (program files that your computer needs in order to work) may become corrupted. Over time computers also SEEM to get slower. All of these things can work together to make your computing frustrating. Fixing them can be intimidating. The purpose of this series of workshops is to quell fears of working out some of the problems a computer may experience and empower YOU in taking control of your computers problems.

Day One: Basic Maintenance

Some of these settings, files, and programs that accumulate are generated automatically when you browse the Internet, download programs, install software, etc. Some of the worst of these is ad-ware and spy-ware (software that causes advertisements to pop-up on the screen, or record and report your browsing habits). Ad-ware can be downloaded from the Internet disguised as a free program, come in the form of cookies (small files automatically generated by a website and saved on your computer), or it can come on a CD that has a desirable program on it (like the ones my wife gets out of Cheerios boxes), but when installed you get advertisements for other things (like AOL). Corruption of files may happen as well. Everything on a computer is stored as either a "0" or a "1". Over time some of the 0's may start thinking they are 1's and visa versa. Although this is unusual it doesn't take much corruption to render a computer program useless, or at least limit its performance.

*If you don't
understand a term
I use, you can
look it up on
www.netlingo.com*

The following steps should be done in order to maximize your results:

1. **Backup** your important files (anything you don't want to lose . . . a *PowerPoint* project for example). If you have a CD burner, burn these files to a CD. This should be done periodically anyway. I like to keep all of my stuff in one folder (*My Documents* for example). That way all I have to do is take this folder and copy it to a CD once in a while. That way, if my computer crashes, I don't lose everything I have worked on for the past 10 years.
2. Go to your computers control panel. Open **Add and Remove Programs**. Browse through the programs listed. If there are programs installed on your computer that you do not wish to be there, remove them. If your not sure if a program is one that is a nuisance, it is probably better to leave it until you have researched it and determined it is unneeded. If there is only one program that is giving you trouble (*Microsoft Office* for example), it may be a good idea to uninstall it, and then re-install it (there is usually a repair option when doing this, but I have had limited success with this. I have found that I am usually better off doing a complete uninstall of a program and then reinstalling it).

*If you're not sure how to
complete some of these tasks, the
HELP menu is a very useful place
to find answers.*

3. Run a **virus Scan** on your computer if you can. Make sure that the virus definition files are up to date. Sometimes viruses, worms, or Trojan horses may be on your computer wreaking havoc or simply being a nuisance. A good virus software such as Symantec will usually find and remove (or quarantine) most viruses.
4. Do a **Disk Cleanup**. Your computer accumulates files as you use it. These files are often called *temporary files*. These files take up needed space on your computer. These files may be part of an Internet Browser Cache, leftovers from installing a program etc. The Disk Cleanup feature will also allow you to compress old files. This can free up hundreds of megabytes of space on your computers hard disk. It is usually OK to select most of the options under disk cleanup, but you should always read about what each option does before you select it.
5. Run **Disk Defragmenter**. This is a program that comes with your operating system (like windows). A good analogy is this. A desk may become cluttered with papers, magazines, catalogues, and other paraphernalia. When this happens it becomes time consuming to find what you are looking for. Once your desk is clean and organized, you can find things quickly and easily. Your computer is similar to this. Sometimes files get scattered all over the hard drive and it takes the computer extra time to find and execute these files. Running defragmenter is like organizing your desk. On a *Windows 98* operating system I have found that it is useful to run defragmenter once a week and you can set it up to run automatically. With *Windows XP* I have found that this is not necessary. Just run it when your computer slows down, or 3-4 times a year for good measure. (*NOTE: If you have windows 98 you may need to disable the screen saver and any other programs that run automatically for defragmenter and scan disk to work.*)
6. Run **Scan Disk**. This will check your computer's hard disk for errors. This feature is usually not necessary with *Windows XP*.
7. Do a **System Restore**. *Windows XP* has this option. Basically, if your computer was working properly on a certain date, and it is now not working properly, you can set the computer to go back to the state it was in on that date. This should not affect files you have saved like Word documents and other projects you have been working on. I have had this feature work for me about half the time. To do a system restore, go into the control panel, go to system. System restore will be one of the options in the upper left corner of the screen that you can select.
8. Run **Diagnostic Programs**. Most computers will have at least one of these. They may be on a CD, or somewhere in the programs. These programs will ensure that your hardware (the actual parts) or your computer are working properly. You may need technical support to help you (if your computer is under warranty this service is usually free). If your computer still works, (just not properly) this is unlikely the cause of your problems. When hardware (such as memory, hard drive, etc.) fails it must be replaced.
9. When all else fails I have found that it is easier to **reformat** the hard drive on the computer than to continue searching for a problem. I spent 4 hours once tracking down a problem, and I could have reformatted and reinstalled all the software in 2 hours. I have found that computer run better if they are reformatted once every couple of years anyway.

- a. Every brand of computer is different when it comes to completing the reformatting process, but most are similar. You should be aware that **this will totally annihilate EVERYTHING** on your hard drive. No program, or file you previously had on your computer will be there when you are done. This process has become much easier with *Windows XP*.
 - i. Insert the disk labeled “Reinstallation disk Windows XP”
 - ii. Restart your computer. When it restarts you need to tell it to boot to the CD. You can do this by pressing F12 on our computers (Dell 4400’s) and then selecting the “boot from CD” option.
 - iii. When it prompts you to hit any key to continue do it.
 - iv. The computer will now run for a while. When it is done you will see a screen that asks you if you want to repair or reinstall *Windows XP*. Select Install windows XP (I have had very limited success with the repair feature, although you could try it if you want).
 - v. There will now be a screen that shows the partitions on the computer. You need to delete the partition c:\. Once this is deleted you will have almost all of the space on your hard drive un-partitioned.
 - vi. Create a new partition. I would recommend that you assign all available space to the c:\ partition.
 - vii. Be sure to format this partition using NTFS if you are installing *Windows XP*. FAT 32 is used for *Windows 98*. NTFS file system allows each file on the hard drive to have security permissions. This is nice because you could secure your files so that they cannot be changed, or even accessed by another user who logs onto your computer. The control this gives over security is awesome.
 - viii. Allow the hard drive to be reformatted.

Day Two: Installing windows XP and Drivers

Now that the hard drive is completely clear of all files that have been on it previously, we can now install a fresh copy of the operating system. We will **install windows XP operating system**. You can do this immediately after formatting the computer. We left the computers after we started the formatting process and let them run. Even though it has been overnight, the reformatting process usually only takes about 20-40 minutes. The computers are now prompting us to install Windows XP. Follow the on screen prompts, they are self-explanatory. It usually takes about a half hour to install Windows.

Next we must **install any drivers** for peripherals or hardware that is on your computer. Drivers are software programs that allow hardware on your computer to operate properly. This may include drivers for a network card, modem, soundcard, videocard, DVD or CD burner etc. These are usually found on a CD or CD’s that came with your computer (or with the hardware if you purchased hardware separately). Usually you can download these off of the Internet from the companies website as well. I would recommend this because then you get the most up-to-date drivers. With our dell 4400’s, the only additional software we needed was some for the soundcard.

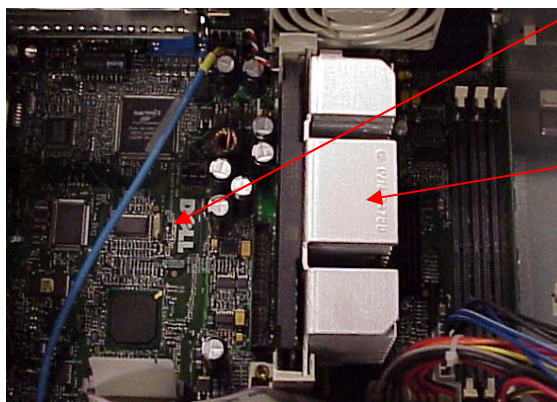
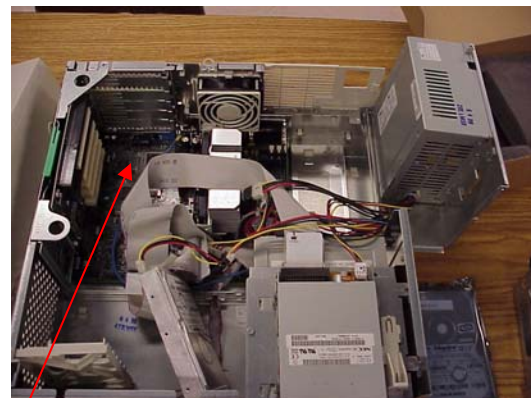
Once *Windows XP* and all of the necessary drivers are on your machine it is important to **adjust your network settings if necessary**. This may include setting up your modem on your home computer. Your network administrator or Internet Service Provider (ISP) will probably need to help you with this (often can be done over the phone).

It would be a good idea at this point to **install virus protection software**. Make sure that it is updated (downloaded the latest virus definition files from the internet), and that the settings are set to update automatically. This will help to prevent viruses from getting onto your newly formatted machine.

We should now perform a **Windows Update**. The computer must be connected to the Internet to do this. There is usually a Windows Update Icon under Start>All Programs. Click on this and follow the onscreen prompts. It is fairly automatic and self-explanatory. I would also go into the control panel>system> and click on the automatic updates tab and set the computer update automatically. The most current update for Windows XP is **service pack 2**. Service pack 2 fixes many problems they have found with XP over the past couple of years. It includes all *Hotfixes* from service pack 1, advanced security features, a pop-up blocker for Internet Explorer. IF some features on your computer do not work after you install service pack 2 (and they worked before), you may need to adjust the firewall settings or disable the firewall. Installing Service pack 2 can take up to a half hour. You can start it and let it run until it is finished.

Day 3: Replacing Hardware (see note at bottom before attempting)

Computer hardware is continually progressing. I read once that every 3 years, computers double in speed, and storage capacity. This means that progression is happening exponentially. If your computer is a few years old, it may be worth upgrading the hardware. Hardware is getting less expensive, simpler to work with, smaller in size, faster, and able to store more information, *at an incredible pace*. There are millions of circuits, parts, and whatchamacallits that make up a computer. There are only a few parts that you need to worry about. If a smaller part of one of these main parts goes bad, you would normally just replace the entire main part (a motherboard for example). The Main hardware you should worry about are these:

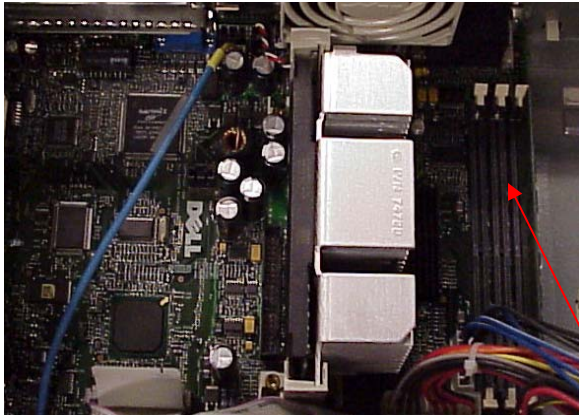
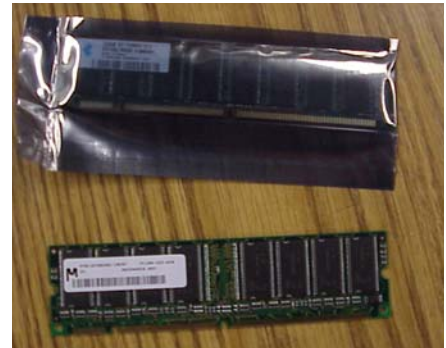


The **motherboard**. This is the main circuit board in the computer. Some motherboards include video cards on them as well as a place for everything else to plug into.

The **Central Processing Unit (CPU)**. This is the part of the computer that does all of the calculations. It is usually found plugged into and attached in the middle of the motherboard somewhere. Processing speeds are currently measured in gigahertz (the ones we replaced were 1.4 Ghz). This means that the computer can do 1.4 billion calculations per second. Only a few years ago I bought a computer that was only 1/10 of this

speed. CPU's come with a heat sink (the metal fins) to dissipate heat. Newer processors usually come with a heat sink and a small cooling fan. This is because they generate a significant amount of heat, and if they overheat they will not function (the computer measures the temperature of the CPU and shuts it down if it becomes too hot).

Memory. Random Access Memory (RAM) is where the computer temporarily stores files it is currently using (like the files that Microsoft Word needs to run). Whenever the computer is restarted or turned off, RAM is cleared. Memory is currently measured in megabytes, (millions) but I have seen some memory measured in gigabytes (Billions). We upgraded these computers to 128 MB of ram. Mr. Culverwell's new computer has 2 GB of ram (2000 MB) and I suspect that soon most new computers will have this much.



Only a few years ago I bought a new computer that had only 32 MB of ram. The more RAM you have in your computer, the faster it will seem to run because it can store more information quickly and allow you to run more things at the same time. When RAM fills up (like when your running lots of programs at the same time) this information must be written and rewritten and rewritten to the hard drive, which is much slower. The motherboard of the computer usually has several slots for memory to go into.

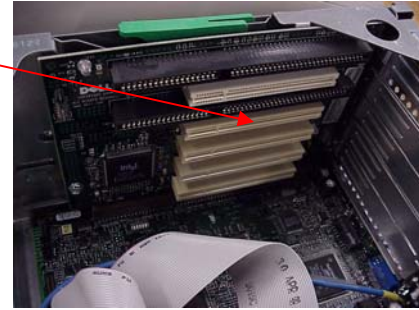
Hard Disk Drive. My first computer (actually it was my family's computer and I was in eighth grade) came with a 20 MB hard drive. Now the typical computer comes with 40-80 GB hard drives (40,000-80,000 MB). Only 5 years ago a 4 GB hard drive was normal. Hard drives are where all of your permanent files, programs, documents, etc are stored. When something is written to the hard drive it stays there until you delete it. If your computer turns on, but will not boot, there is a good chance your hard drive has went bad.



Power supply. This is one of the oldest technologies in a computer. It is simply an electricity transformer that converts AC 120 volt power into DC current that your computer can use. My dad had a Lionel train set when he was a child that had a large transformer to control his electric train. Although the power supply in a computer is a little more complicated than that, it isn't that different. The power supply will provide wires with a plug on them for all of your other devices to plug into to get power. Sometimes the power supply will go bad. If your computer won't even turn on this is most likely the problem.

Other Disk drives. These include CD, DVD, ZIP, Floppy, or even another hard disk drive.

PCI devices. These devices plug into the PCI slots that are usually perpendicular to the motherboard. These could include better video and sound cards, a card (circuit board) for a specific device, extra USB ports, etc.



When replacing any hardware, it is extremely important to follow the directions precisely. Instructions usually come with new hardware and how to install it, how to load software for it, and how to troubleshoot it. It is also important to ground yourself when installing hardware. Your body can build up voltage (sometimes up to 30,000 volts) that could possibly fry one or more of the thousands of computer chips included on a motherboard, memory stick, or other devices. By grounding yourself to the computer (with a ground strap, or by keeping one hand touching the metal part of the computer) this will hopefully keep this from happening.

Day Four: Installing Software

Software installation is fairly straightforward and simple. Usually if you insert the CD (Microsoft Office for example) it will autorun, ask you for some information (like the keycode) and then install itself automatically. I like to go into custom settings when I install anything and make sure it is not installing items that I do not want. This usually says “only for advanced users”, but it is not really that complicated. If it does not autorun, you need to browse the CD and find the Instal.exe file. Double click on this file to run it. Often times if a computer program does not work, uninstalling it and re-installing it will fix the problem.

Day Five: Recap

You have now done a lot of things that deal with computer maintenance. I hope this workshop was worth your time. HAPPY COMPUTING!