



Chapter 2: Introduction to Lab Procedures and Tool Use



IT Essentials v6.0

Cisco | Networking Academy®
Mind Wide Open™

Chapter 2 - Sections & Objectives

- 2.1 Safe Lab procedures
 - Explain the purpose of safe working conditions and safe lab procedures.
- 2.2 Proper Use of Tools
 - Explain how to use tools and software with personal computer components.

2.1 Safe Lab Procedures



Safe Lab Procedures

- The workplace should have safety guidelines to:
 - Protect people from injury.
 - Protect equipment from damage.
 - Protect the environment from contamination.



Characteristics of a Safe Workplace

- Clean, organized, and properly lit workspace
- Proper procedures for handling equipment
- Proper disposal or recycling of components containing hazardous materials
- Safety guidelines
 - Most companies require reporting any injuries, including description of safety procedures not followed.
 - Damage to equipment may result in claims for damages from the customer.
 - **Lift with your legs**
 - Types of safety guidelines: General, Electrical, Fire

Procedures to Protect People

■ General Safety

- Make sure a first-aid kit is available.
- Unsecured cables create tripping hazards.
- Food and drinks should not be in the workspace.
- Remove jewelry.

■ Electrical Safety

- Computer power supplies are dangerous when disassembled.
- Watch for printer areas that are hot or that use high voltage.
- Check the voltage output of AC adapters and chargers before connecting them to devices.

■ Fire Safety

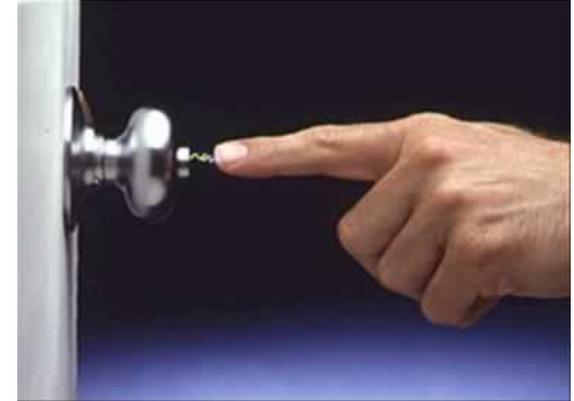
- Turn off the power and unplug equipment before performing service.
- Different types of fires require different types of fire extinguishers; make sure to use to correct one.
- Be alert for odors emitting from computers and electronic devices.



Procedures to Protect Equipment and Data

■ Electrostatic Discharge (ESD)

- Buildup of an electric charge resting on a surface
- 30 volts of static electricity can damage a computer component.
- ESD can cause damage to computer equipment if not discharged properly.
- ESD can build up on you as you walk on a carpeted floor.
- **Low levels of humidity increase ESD**
- **Use a grounded mat on the workbench and a correctly connect antistatic write strap.**



Procedures to Protect Equipment and Data

▪ Electromagnetic Interference (EMI)

- Intrusion of outside electromagnetic signals in a transmission media, such as copper cabling
- Sources can be: Man-made, natural events, climate or any source designed to generate electromagnetic energy.
- EMI distorts the signals, degrading computer communication.
- EMI can be generated by large motors, power lines, electrical storms, or any other source of electromagnetic energy.



Procedures to Protect Equipment and Data

- **Radio Frequency Interference (RFI)**
 - Wireless networks are affected by RFI.
 - RFI is caused by radio transmitters transmitting in the same frequency.



Procedures to Protect Equipment and Data (Cont.)

■ Power Fluctuation Types

- Power fluctuations may impact the operation of computer components.
- Voltage in a computer that is not accurate or steady.
- Types of power fluctuations that can cause data loss or hardware failure.
 - Blackouts – No power
 - Brownouts – Low voltage power
 - Noise – Interference with the voltage
 - Spike – Quick power increase
 - Power Surge – Over voltage power

Procedures to Protect Equipment and Data (Cont.)

■ Power Protection Devices

- Designed to protect computer systems from power fluctuations.
- Surge suppressor
- **Uninterruptible Power Supply (UPS)**
 - **Inline UPS** – uses a battery to supply a constant voltage
- Standby Power Supply (SPS)
- Laser printers should not be plugged to UPSs



Procedures to Protect the Environment

- Computers and peripherals contain materials that can be harmful to the environment.
- Protect the environment by responsibly disposing and recycling:
 - **Material Safety Data Sheet (MSDS)**
 - Use an SDS to obtain information about a material, including procedures for proper disposal.
 - The SDS contains information on the material's composition, how it can affect personal health, fire hazards, and first-aid requirements.
 - It also includes protective measures for the safe handling and storage of materials and spill, leak, and disposal procedures.

Procedures to Protect the Environment

■ Equipment Disposal

- Computer equipment contains hazardous materials and should be properly disposed.
- Follow regulations to protect the environment and avoid fines.
- Batteries, monitors, toner kits, cartridges, developers, chemical solvents and aerosol cans are examples of equipment that must be properly disposed.
- Follow local regulations for disposal.
- CRT monitors are dangerous because of the potential residual high voltage.



2.2 Proper Use of Tools



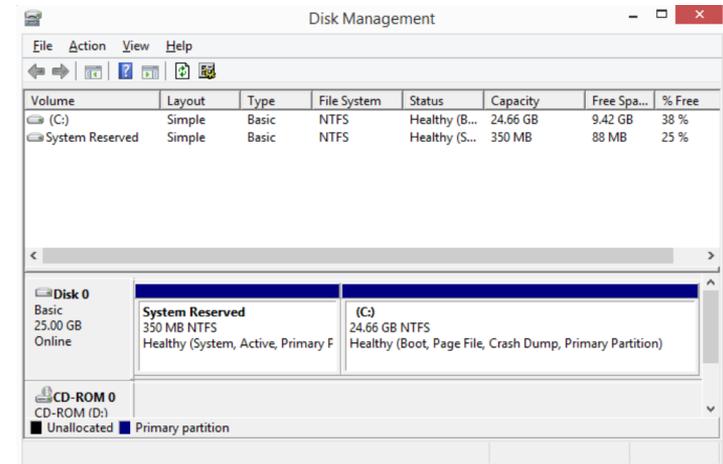
Hardware Tools

- Skilled use of tools and software makes the job less difficult and ensures that tasks are performed properly and safely.
- Hardware tools are grouped into:
 - **ESD Tools**
 - Antistatic wrist straps and antistatic mats help equalize the electrical charge between a person and the equipment.
 - **Hand Tools**
 - Include screwdrivers (straight/slotted or Phillips/crosshead), flashlights and pliers.
 - Avoid magnetic or magnetized screwdriver because of potential harm to drives.
 - **Cable Tools**
 - Include wire cutters and strippers, crimpers and punch down tool.
 - **Cleaning Tools**
 - Include special cloths, chemicals and cable ties.
 - **Diagnostic Tools**
 - Include digital multimeters, loopback adapters, WiFi analyzer, external HDD enclosure, toner probe



Software Tools

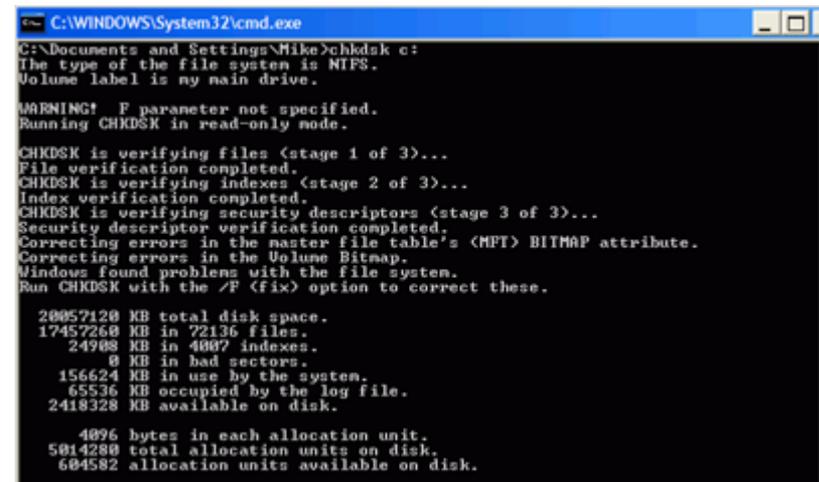
- Like hardware tools, software tools are task-specific.
- Used to diagnose problems, maintain hardware, and protect the data stored on a computer.
- **Disk Management Tools**
 - Used for disk management, formatting, error checking, drive optimization, disk cleanup and more.
 - FDISK or Format
 - Disk Management – initialize disks and create partitions
 - System File Checker (SFC) – scans the critical OS files and replace corrupted



Software Tools

■ Performance Tools

- Used to clean and speedup disk operations. Use space more efficiently.
 - Scandisk or CHKDSK
 - Defrag
 - Disk Cleanup



```

C:\WINDOWS\System32\cmd.exe
C:\Documents and Settings\Mike>chkdsk c:
The type of the file system is NTFS.
Volume label is my main drive.

WARNING! F parameter not specified.
Running CHKDSK in read-only mode.

CHKDSK is verifying files (stage 1 of 3)...
File verification completed.
CHKDSK is verifying indexes (stage 2 of 3)...
Index verification completed.
CHKDSK is verifying security descriptors (stage 3 of 3)...
Security descriptor verification completed.
Correcting errors in the master file table's (MFT) BITMAP attribute.
Correcting errors in the Volume Bitmap.
Windows found problems with the file system.
Run CHKDSK with the /F (fix) option to correct these.

28957120 KB total disk space.
17457260 KB in 72136 files.
24908 KB in 4887 indexes.
0 KB in bad sectors.
156624 KB in use by the system.
65536 KB occupied by the log file.
2418328 KB available on disk.

4096 bytes in each allocation unit.
5814280 total allocation units on disk.
684582 allocation units available on disk.
    
```

Software Tools

■ Protection Software Tools

- Malicious software can damage or compromise operating systems, applications, and data.
- Software protection tools include antivirus, antispyware, firewalls and update manager software

- [Windows 7 Security Center](#)
- [Antivirus program](#)
- [Spyware Remover](#)
- [Window 7 Firewall program.](#)

Help protect your PC with Windows Firewall

Windows Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

	Private networks	Not connected 
	Guest or public networks	Connected 
Networks in public places such as airports or coffee shops		
Windows Firewall state:	On	
Incoming connections:	Block all connections to apps that are not on the list of allowed apps	
Active public networks:	 cisco.com	
Notification state:	Notify me when Windows Firewall blocks a new app	

Proper Tool Use

- Safety in the workplace is everyone's responsibility.
- Before cleaning or repairing equipment, check to make sure that tools are in good condition.
- Proper use of an antistatic wrist strap can prevent ESD damage to computer components.
 - CAUTION: Never wear an antistatic wrist strap if you are repairing a monitor or power supply.
- Proper use of an antistatic mats on workbench and floor transfers static electricity away from equipment to a grounding point.
- Keep all components in antistatic bags.
- Proper use of hand tools (nothing magnetic).
- Proper Use of Cleaning Materials (clean contacts with isopropyl alcohol).
 - CAUTION: Before cleaning any device, turn it off and unplug the device from the power source.

Organizational Tools

It is important that a technician document all services and repairs for future reference.

■ Personal Reference Tools

- Include troubleshooting guides, manufacturer manuals, quick reference guides, and repair journals.
- History of repairs and a notepad can be extremely useful as a technician performs troubleshooting and repairs.
- The Internet can be a great reference tool by providing access to specialized forums, search engines, manufacturer's FAQs, and more.

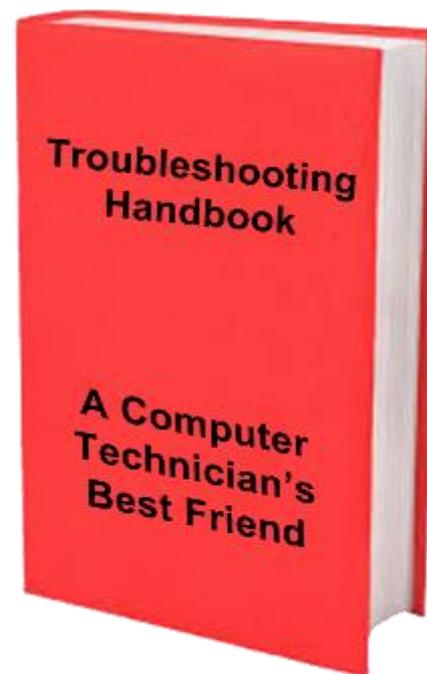
■ Miscellaneous Tools

- Additional secondary items can be added to the toolkit.
- Masking tape, a working computer and even pencil eraser can be very useful additions to a technician's kit.



Documentation

- Provides reference material for similar problems when they are encountered in the future.
- The documents can be paper-based, but electronic forms are preferred because they can be easily searched for specific problems.



2.3 Chapter Summary



Summary

- This chapter discussed safe lab procedures, correct tool usage, and the proper disposal of computer components and supplies.
- Work in a safe manner to protect users and equipment.
- Follow all safety guidelines to prevent injuries to yourself and others.
- Know how to protect equipment from ESD damage.
- Know about and be able to prevent power issues that can cause equipment damage or data loss.
- Know which products and supplies require special disposal procedures.
- Familiarize yourself with the SDS for safety issues and disposal restrictions to help protect the environment.
- Be able to use the correct tools for the task.
- Know how to clean components safely.
- Use organizational tools during computer repairs.

Cisco | Networking Academy[®]
Mind Wide Open[™]

