HARDWARE FUNDAMENTALS AND INSTALLATION 3
• Display
  • CRT
  • LCD
  • LED
  • Plasma
  • Projector
• Display Connectors
  • Coaxial
  • Composite
  • Component
  • VGA
  • DVI
  • HDMI
  • DisplayPort
• Hard Disk Drive
• PATA
• SATA
• SCSI
• RAID
• Optical Disks
• USB Connections
• Firewire IEEE 1394
• Flash Memory
• Removable Drives
• SSD
• Drive Installation
• Drive Configuration
• Windows 7
• Windows XP
• RJ45 Connector
• RJ11 Connector
• Mouse
• Keyboard
• Touchscreen
• Scanner
• Barcode Reader
• Biometric Devices
• Gamepad and Joysticks
• MIDI
• Webcam
• KVM
• Input Devices
• Installation
  • Configure a Mouse
    • Windows 7
    • Windows XP
  • Configure a Keyboard
    • Windows 7
    • Windows XP
• Cathode Ray Tube – 15 – 21 inches
• Resolution – XGA 1024x768, SXGA 1280x1024, UXGA 1600x1200
• Liquid Crystal Display
• Light Emitting Diode
  • Less power than LCD
• OLED - Organic LED
• AMOLED – Active Matrix Organic LED
• Voltage creates plasma
• UV light strikes colored phosphor
• Deep blacks
- LCD
- Bulbs
- Always allow bulbs to cool off
Display Connectors - Coaxial

- Analog 1 wire
- RG59, RG6 connectors
- Transmission of radio frequencies
- Video and data
Display Connectors - Composite

- Analog, interlaced
- NTSC, PAL, SECAM
- Uses RCA plugs and cables
- 480i, 576i
- S-Video
  - 2 channel, 4 pin mini-DIN
  - Separates luminance and color
• Analog, 3 separate signals
• YpbPr
  • Y: luminance
  • Pb diff blue yellow
  • Pr diff red yellow
• RGB – red, green, blue,
• Uses RCA plugs and cables and VGA port
• VGA – Video Graphics Array
• DE-15, 15 pin analog
• Found on video cards, motherboards, monitors, HD TV
- DVI – Digital Visual Interface, 1999
- Uncompressed video
- Analog and digital modes
- Compatible with VGA spec
- Mostly computer industry, early HD TV
• HDMI – High Definition Multimedia Interface
• Digital, uncompressed video, compressed / uncompressed audio
• Found on video cards, motherboards, monitors, HD TV
Display Connectors - HDMI

- V1 – 2002, uncompressed
- V1.2a – 2005, sRGB, YCbCr, command sets (CEC)
- V1.3 – 2006, higher bit video, audio sync, HD audio, HDMI type C mini connector
- V1.4 – 2009, higher resolution (QuadHD), HDMI Ethernet Channel (HEC), Audio Return Channel
• Connects video, audio, USB, data
• Royalty free from VESA – Video Electronics Standards Association
• Uses packeted data transmission
• Data rate: 5.1 – 17.28 Gb/s
Display Connectors - DisplayPort

- RGB, YCbCr, 3D, encryption, 6,8,10,12,16 bit color depth
- 8 channel 24 bit 198 kHZ audio
- Replaces VGA, DVI, complements HDMI
- Standards – mini DisplayPort (mDP), Direct Drive Monitor (DDM), Embedded DisplayPort (EPD), Internal DisplayPort (iDP), Portable Digital Media Interface (PDMI), Wireless DisplayPort (wPD), Mobility DisplayPort (mDP)
Anatomy of a Hard Disk Drive

Controller

Actuator

Motor contacts

Read-write head

Fasteners and other hardware

Closeup of the read-write head

Other side of the frame

Frame

Actuator magnet

Dissicant bag

Hole for the motor

Hole for actuator axis

Cover (upside down)

Platter Assembly

(2 platters and the motor)

Spindle motor

Western Digital
Caviar 223000 2.111.8 MB

Hard Disk Drive
• Parallel ATA, born in 1999
• IDE – Integrated Drive Electronics
• EIDE – Enhanced IDE
• Speed – 16 - 133 MB/s
• 40 and 80 wire
• Master/Slave, Cable Select
• Serial ATA
• 7pin data connector
• 15pin power
  • 3.3, 5, 12 V
• eSATA – external SATA
• Speed
  • V1 1.5 Gb/s
  • V2 3 Gb/s
  • V3 6 Gb/s
• Small Computer Systems Interface, 1981
• Formats – Fast SCSI, Ultra SCSI, Ultra Wide SCSI, Ultra2/3 SCSI, Ultra 320/640 SCSI, iSCSI
• Speed – 5 – 640 MB/s
• Automatically configures, no jumpers, ID 0-7 or 0-15
• Need to terminate
• Redundant Array of Independent Disks
• RAID 0 – Striping
• RAID 1 – Mirroring
• RAID 5 – Striping + Mirroring
• RAID 10 (1+0) – a Strip of Mirrored drives
• Controllers
  • Software
  • Hardware
Optical Disks

- CD 640, 700 MB
- DVD 4.7 / 8.5 GB
- Blu-Ray 25 / 50 GB
USB Connections

- USB
- Speed
  - v1.1 – 12 Mb/s
  - v2 – 480 Mb/s
  - v3 – 4 Gb/s
• Connect up to 127 devices
• Backward compatible
• USB Hubs and cables are not forward compatible
• 3-5 meters distance
• (Below) from L to R: micro, non USB, mini-B, type A receptacle, type A, type B
• “Firewire” IEEE 1394
  • Connect 63 devices
  • 1394a – 400 Mb/s
  • 4 and 6 pin connectors
  • 1394b – 800 Mb/s
  • 9 pin
  • Rare speeds - S800T, S1600, S3200
  • Distance between devices 15 feet, max length of connected devices 72 meters
• USB
• V1.1, 2, 3
• Secure Digital – SD, SDHC, SDXC, Mini SD, Micro SD
• Compact Flash
• Memory Stick
Removable Drives

- USB
  - V1.1, 2, 3
- FireWire
- eSATA – external SATA
• Solid State Drive (SSD)
• Large capacity designed to supplement or replace HDD 60 GB – multiple TB
• Very fast seek times (100 µs vs 2.9 ms, no moving parts) and high transfer rate (7.2 GB/s and 2.52 M IOPS – Input Output Operations Per Second vs 140 MB/s 210 IOPS for HDD)
• Can significantly speed up a computer system

• Hybrid SSD combine solid state memory and a classic hard drive for increased performance of SSD and reduced cost of HDD
- Ensure motherboard/drive compatibility
- Power off and unplug everything, open the system case, ground yourself
- Remove power and data connections from old drive (if needed), unscrew, and remove
- Install expansion card for drive controller (if necessary)
• Set jumper pins, termination for new and remaining drives (if necessary)
• Insert new drive, secure to case with screws, plug in power, data, and fan connectors
• Replace the case and power cord
• Power on, adjust BIOS settings, test
• Open Computer Management
  • Windows 7: Start Menu → Search “Computer Management” → Computer Management
  • Windows XP: Control Panel → Administrative Tools → Computer Management
• Select Disk Management
• Right click on new disk, select New Volume
• Follow wizard prompts
Drive Configuration Windows XP
Drive Configuration Windows XP

The image shows the Computer Management window in Windows XP, specifically the Disk Management section. The window displays two disks:

- Disk 0 (Basic disk) with a 19.99 GB NTFS partition named (C), which is healthy (System).
- Disk 1 (Dynamic disk) with 94 MB of unallocated space.

A new volume wizard is open, displaying options to create a new volume:

- **Simple**: A simple volume is made up of free space on a single dynamic disk. Create a simple volume if you have enough free disk space for your volume on one disk. You can extend a simple volume by adding free space from the same disk or another disk.
- **Spanned**: A spanned volume allows you to combine multiple volumes into one larger volume.
- **Striped**: A striped volume allows you to combine multiple volumes into one large volume with improved performance.

The wizard is asking to select the volume type.
• 8 contact, 8 wire
• Unshielded/shielded twisted pair
• Ethernet networking
• TIA/EIA-568-B standard
• 6 positions, 4 contacts, 2-4 wires
• Telephone audio/fax/phone system
• GUI cursor input device
• Connection PS/2, USB, wireless, Bluetooth
• Mechanical and optical
• Character input device
• Connection PS/2, USB, wireless, Bluetooth
• Mechanical, optical, foldable
• 101/104 key US, 102/105 international
• Laptop – smaller, less keys, usually no 10-key number pad
- GUI control through a touch interface
- Resistive – single touch
- Capacitive – multi touch
- High use in mobile devices
- Increased use with Windows 8 Metro interface
• Optically scans images, text, handwriting, objects, etc. and converts it to a digital image with a CCD capture device
• Connection: Parallel, SCSI, USB, FireWire, network
• SANE – Scanner Access Now Easy – open source
• TWAIN – standard protocol and API, high speed scanning, digital cameras, multiOS
• Optically scans barcodes for rapid data entry
• Pen, laser, CCD, camera based technology
• Connection: RS-232, EPOS, PS/2, USB, 802.11 network, Bluetooth
Biometric Devices

• Primarily used to identify humans by their unique traits:
  • Fingerprint
  • Vein matching
  • Iris recognition
  • Facial analysis
  • Vocal analysis
Game Pad and Joysticks

• Controllers with multiple buttons, directional pads, joysticks, sliders, force feedback, etc. for game software
• Handheld, joysticks, 1 or 2 hands
• Connection:
  • Gameport – 15 pin
  • USB
  • Bluetooth, 802.11
• Musical Instrument Digital Interface
• Protocol for digital musical instruments and computers to connect
• MIDI file – musical sequence and sound information, small file size, widespread use in early computers, ringtones, web pages
• Video camera that feeds real time video images to a computer or over a computer network
• Use: video conferencing, video phones, video capture and stills
• Many laptops, tablets, and smart-phones have a webcam integrated
• Performance measured in megapixels and frames per second
• Connection:
  • USB
  • Bluetooth, 802.11
• Keyboard, video, mouse
• Allows multiple computer system connections to a single keyboard, monitor, and mouse
• Not Kernal Virtualization Machine – Linux virtualization technology
• PS/2, USB, VGA, DVI, HDMI, 3.5mm mini plug audio connections
- Power off and unplug everything
- Install an expansion card if necessary
- Locate USB, PS/2, or custom ports on computer system/expansion card and connect the input device
- Install software or drivers (if needed)
- Configure software (if needed)
- Verify input device is working
• Start → Control Panel
  • Windows 7: Hardware and Sound → Mouse
  • Windows XP: Mouse
  • Buttons: primary mouse button, click speed, ClickLock
  • Pointers: scheme, pointer shadow
  • Pointer options: pointer speed, Snap To, visibility
  • Wheel: vertical and horizontal scrolling rates
  • Hardware: advance settings, hardware driver
Windows 7
Input Devices – Configure a Mouse

Windows XP
• Start → Control Panel
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Windows 7
THANK YOU