CompTIA A+ Core 1 Exam 220-1101

Lesson 1

Installing Motherboards and Connectors

Objectives

- Explain cable types and connectors
- Install and configure motherboards
- Explain legacy cable types

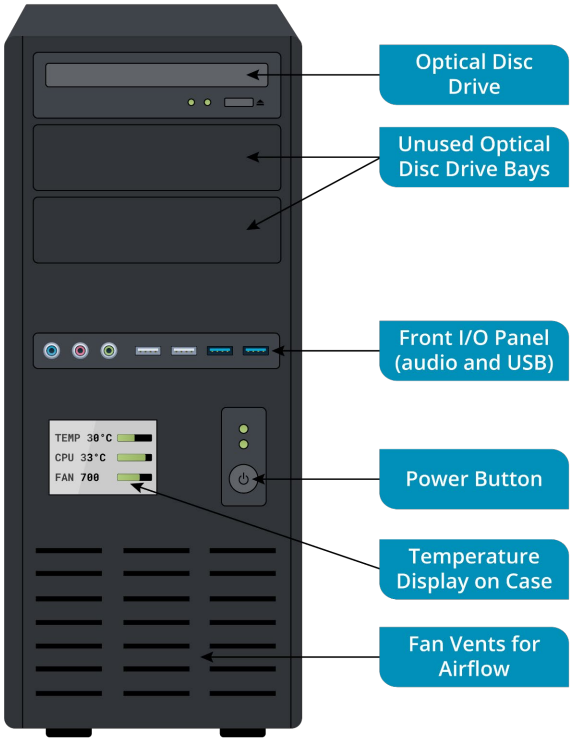
Lesson 1

Topic 1A

Explain Cable Types and Connectors

Personal Computers (Slide 1 of 2)

- System case
  - Tower versus all-in-one
- Side panel
  - Access system components for upgrades and maintenance
- Front panel ports and features



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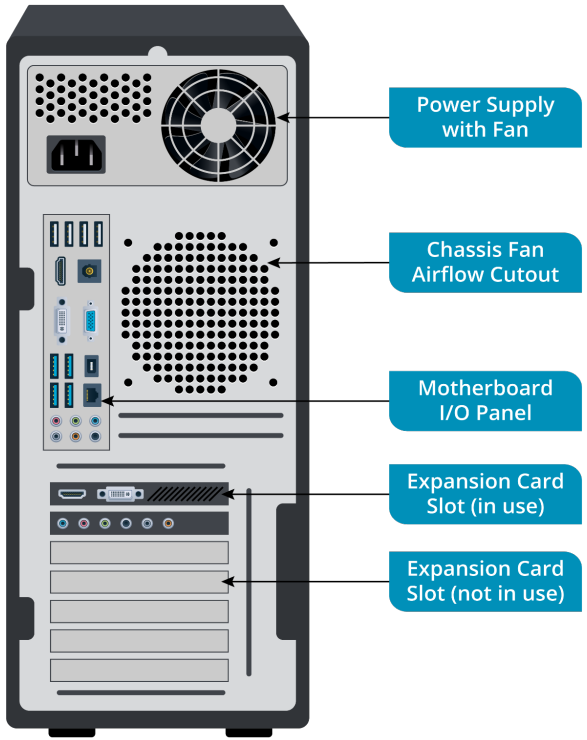
Personal Computers (Slide 2 of 2)



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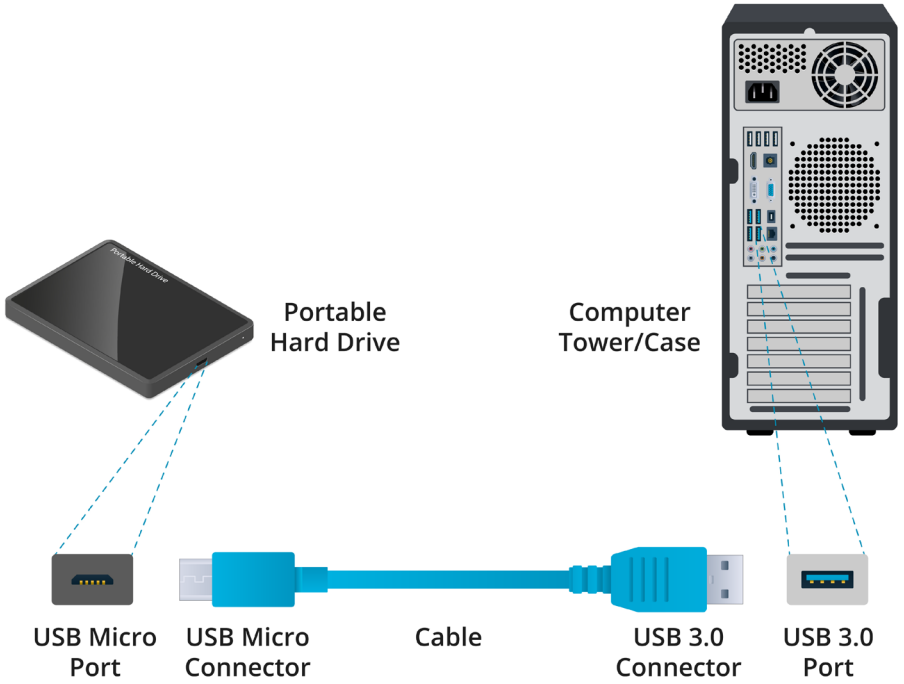
- Rear panel ports and features
  - Power supply and fans
  - Motherboard input/output (I/O) ports
  - Expansion card ports and blanking plates

Peripheral Devices

- Input/output ports and peripheral cable types
- Interfaces, ports, and connectors
- Binary data storage and transfer units



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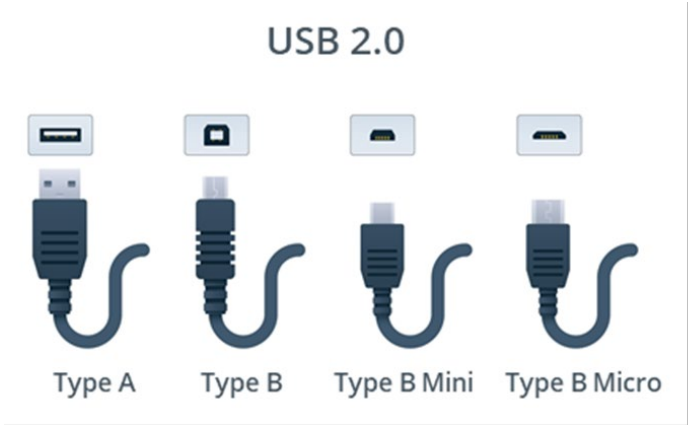
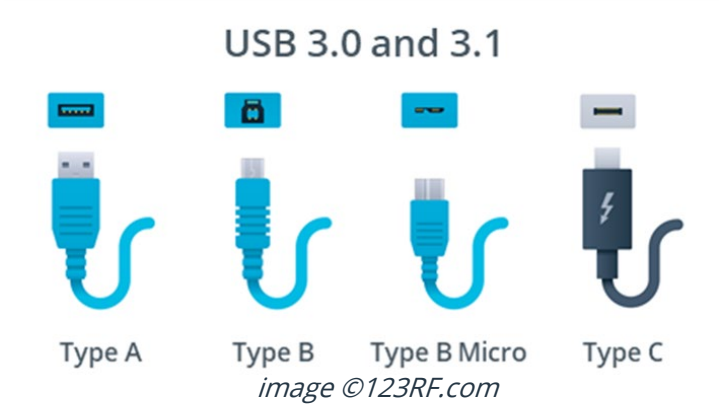
Universal Serial Bus Cables





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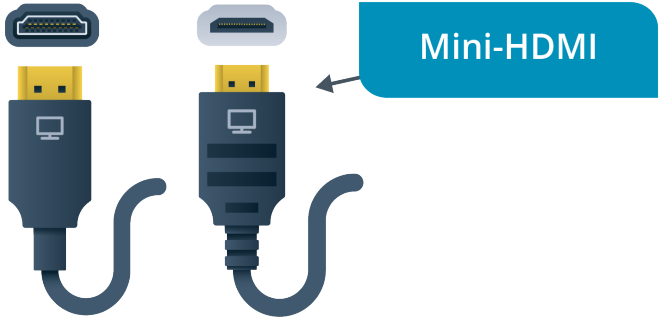
- Multipurpose external bus
  - Controllers, ports, and maximum supported devices
  - Power and charging
- USB 2.x versus USB 3.x
  - Data rates
- USB connector types
  - Version compatibility and cable considerations

HDMI and DisplayPort Video Cables

- Video requirements
  - Bandwidth (resolution and refresh rate)
- High-Definition Multimedia Interface (HDMI)
  - Versions and cable considerations
- DisplayPort
  - Daisy chaining



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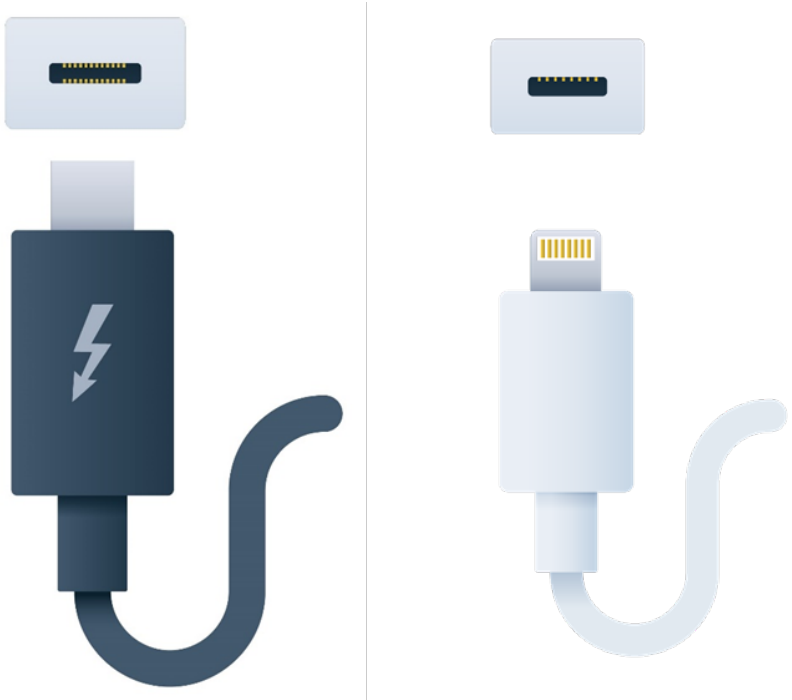
Thunderbolt and Lightning Cables



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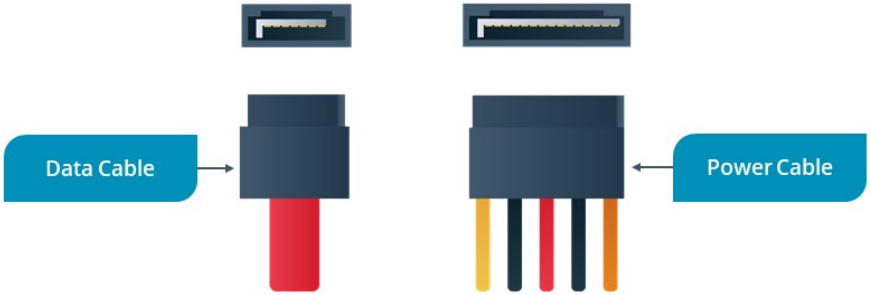
- Thunderbolt
  - Versions and connectors
  - Active versus passive cabling
  - USB compatibility
- Lightning connector
  - iOS device connector
  - Adapter cables

SATA Hard Drive Cables

- Serial Advanced Technology Attachment (SATA)
  - Data connector
  - SATA power connector
- Molex power connectors
- External SATA (eSATA)



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Review Activity: Cable Types and Connectors

- Personal Computers
- Peripheral Devices
- Universal Serial Bus Cables
- HDMI and DisplayPort Video Cables
- Thunderbolt and Lightning Cables
- SATA Hard Drive Cables
- Cable Types and Connectors

Lab Activity

- Virtual WorkBench Lab: Upgrading/ Installing GPU and Daisy-Chain Monitors

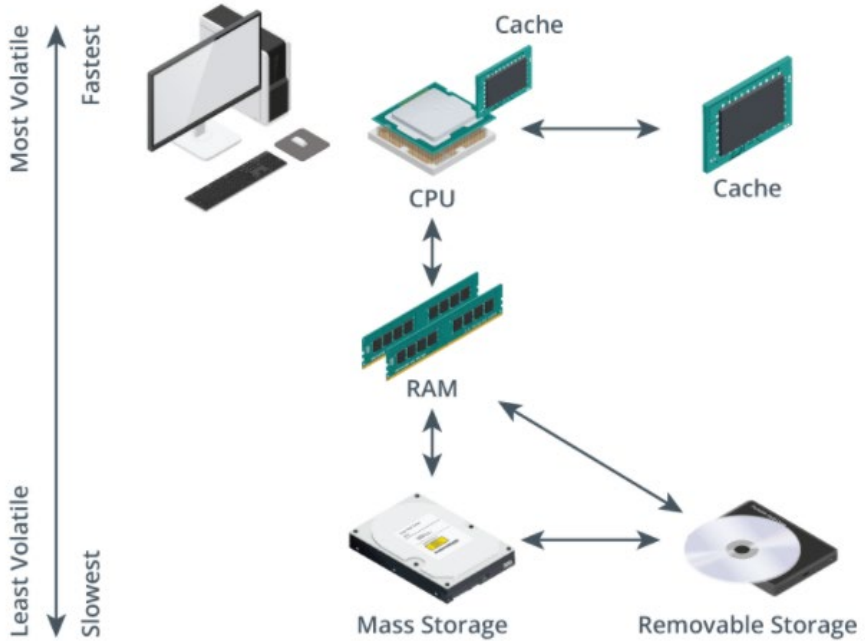
Lesson 1

Topic 1B

Install and Configure Motherboards

Motherboard Functions

- PC system architecture
  - Binary data and instructions
  - Central processing unit (CPU) and cache
  - System memory
  - Mass storage
  - Removable storage
- Clock speed and frequency multipliers



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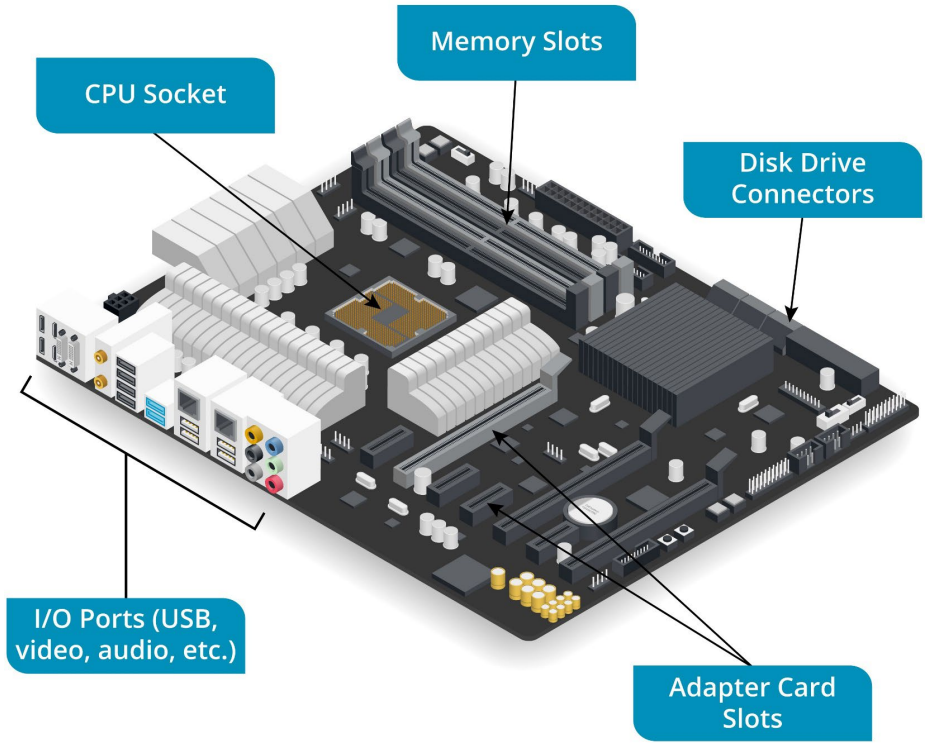
Electrical Safety and ESD

- Electrical safety
  - Disconnect power
- Electrostatic discharge (ESD)
  - Use anti-static tools to prevent damage to chips

Motherboard CPU and System Memory Connectors

- CPU sockets
  - Socket form factors
  - Chipset
- System memory slots
  - Random Access Memory (RAM)
  - DIMM slots for system memory



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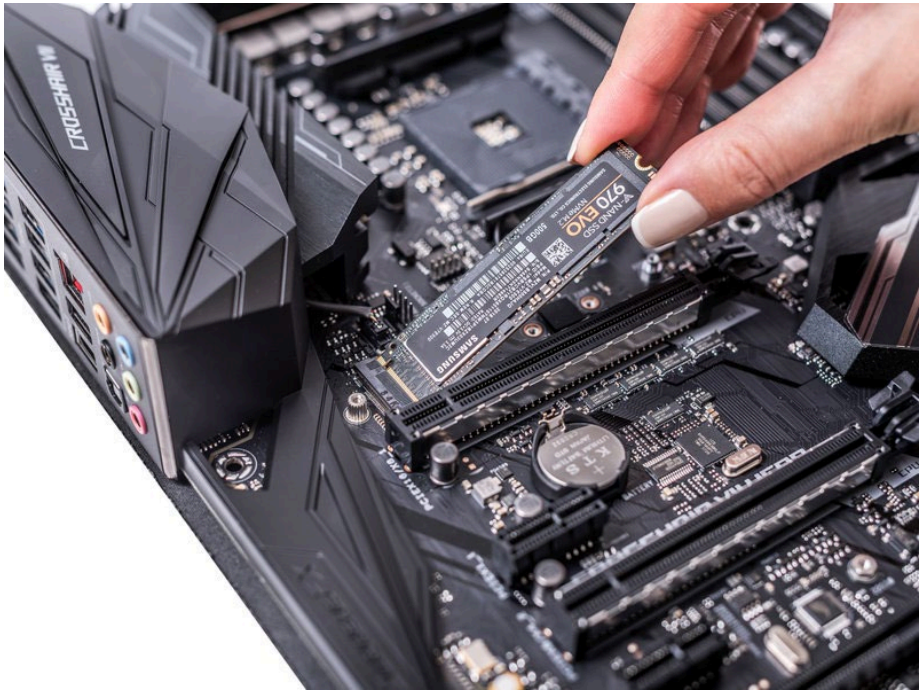
Motherboard Storage Connectors



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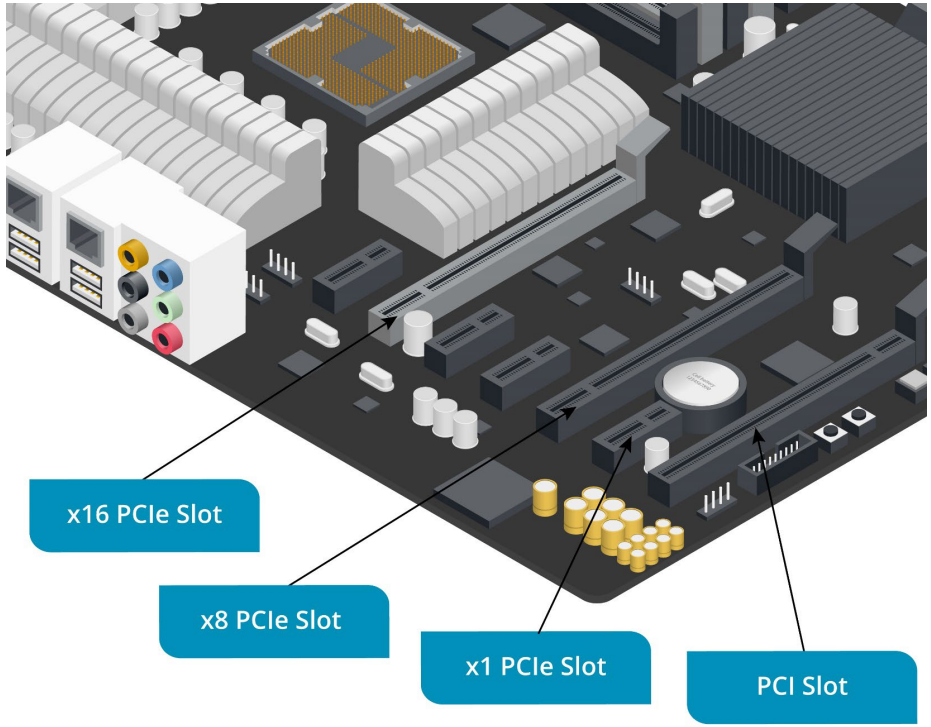
- SATA
- M.2
- eSATA

Motherboard Adapter Connectors

- PCI Express (PCIe)
  - Lanes and link bandwidth
  - PCIe versions and compatibility
  - Power
- Peripheral Component Interconnect (PCI)
  - Legacy interface
  - 3.3V versus 5V



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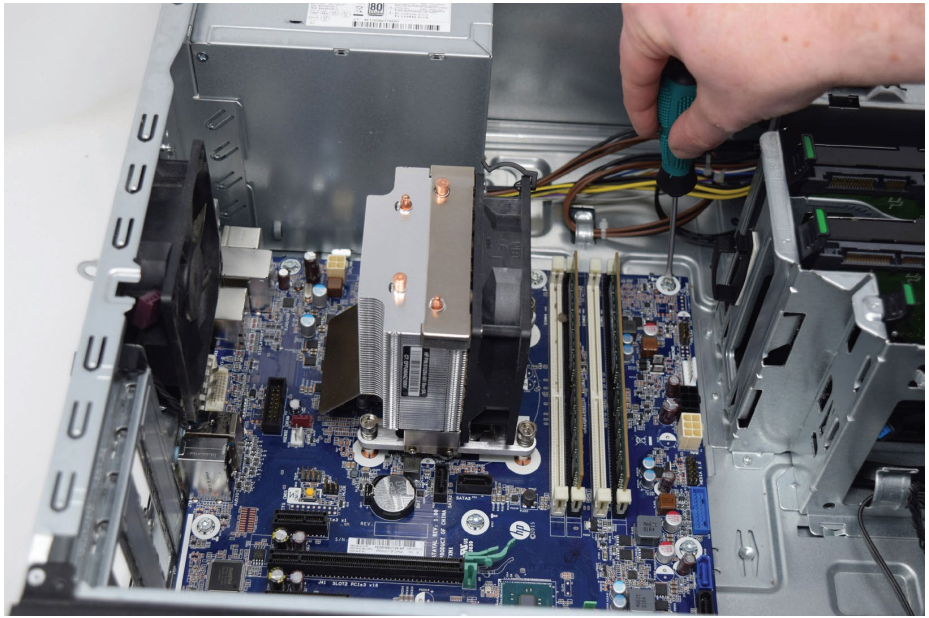
Motherboard Form Factors

- Form factor
  - Physical dimensions
  - Case/power supply compatibility
  - Number of adapter cards supported
- Advanced Technology eXtended (ATX)
  - Full size and micro-ATX
- Information Technology eXtended (ITX)
  - Mini-ITX
- Motherboard installation
  - Standoffs



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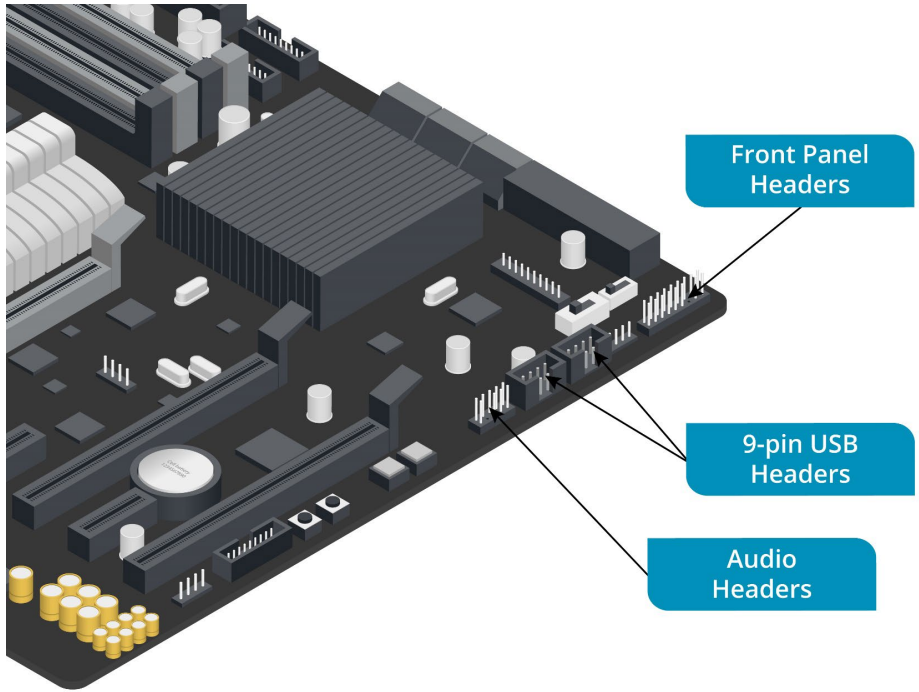
Motherboard Headers and Power Connectors



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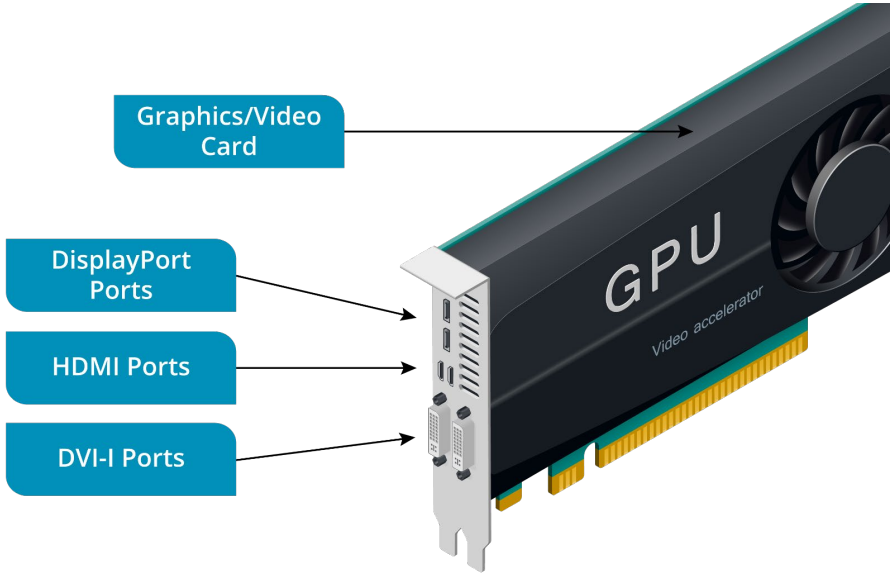
- Headers
  - Connections to case components
- Power connectors
  - P1 motherboard connector
  - Fan connectors

Video Cards and Capture Cards

- Video cards
  - Video output for monitor
  - Graphics Processing Unit (GPU)
    - Frame rate and 3D effects and textures
  - Graphics memory
  - Video ports
    - Type and number
- Capture cards
  - Video input/recording



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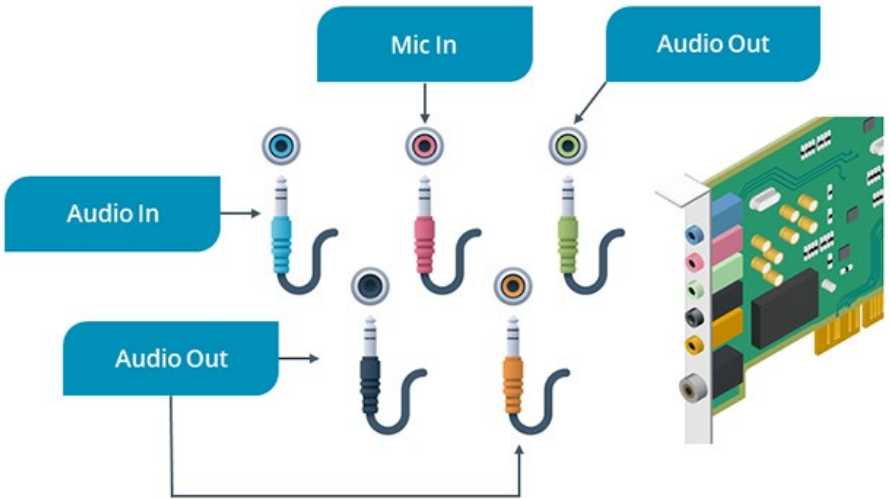
Sound Cards



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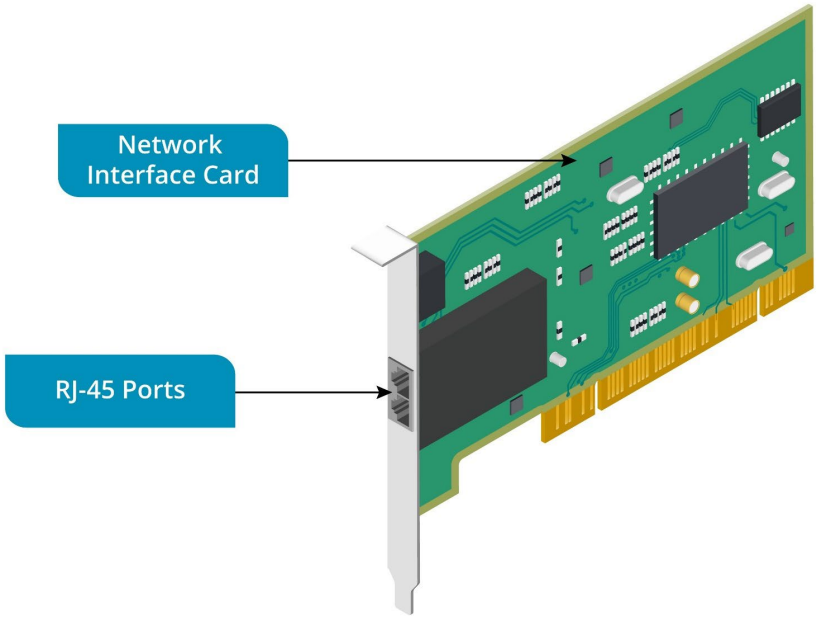
- Audio jacks
  - Output (speakers and headphones)
  - Input (microphones)
- Surround sound support
- External audio interfaces

Network Interface Cards

- Onboard Ethernet networking
- Network Interface Card (NIC)
  - Cable type (copper versus fiber optic)
  - Number of ports
- Wi-Fi adapter



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Review Activity: Motherboards

- Motherboard Functions
- Electrical Safety and ESD
- Motherboard CPU and System Memory Connectors
- Motherboard Storage Connectors
- Motherboard Adapter Connectors
- Motherboard Form Factors
- Motherboard Headers and Power Connectors
- Video Cards, Capture Cards, Sound Cards, and Network Interface Cards

Lab Activity

- Virtual Workbench Lab: Install a Motherboard

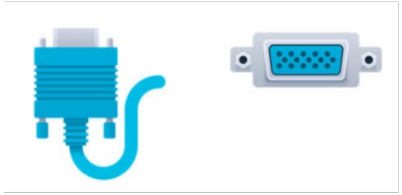
Lesson 1

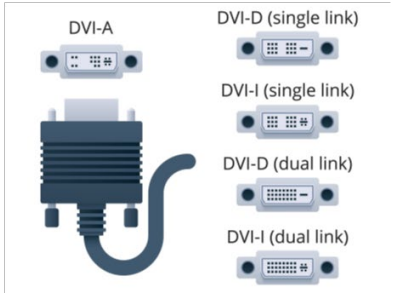
Topic 1C

Explain Legacy Cable Types

DVI and VGA Video Cables

- Digital Visual Interface (DVI)
  - Analog versus digital
- Video Graphics Array (VGA)
  - Analog only
  - Low bandwidth





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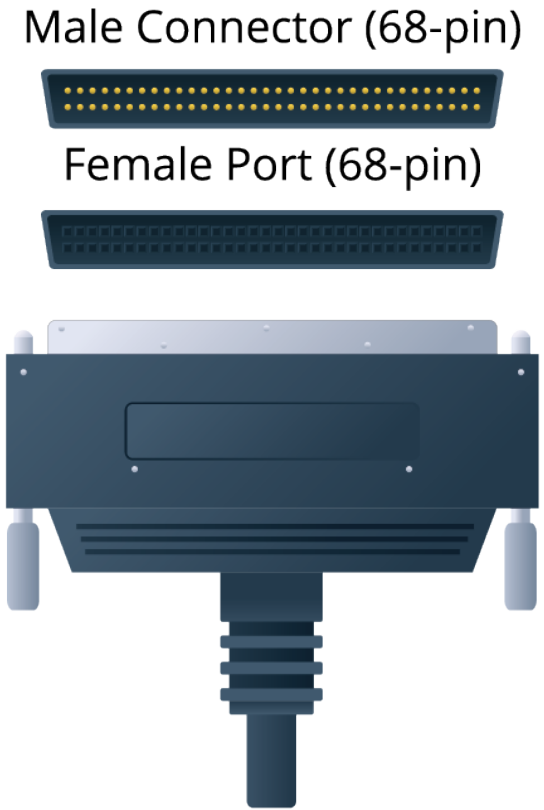
Small Computer System Interface

- Parallel interfaces
- Small computer system interface (SCSI)
  - Versions and connector considerations
  - SCSI ID and termination configuration
- Modern SCSI usage as Serial Attached SCSI (SAS)



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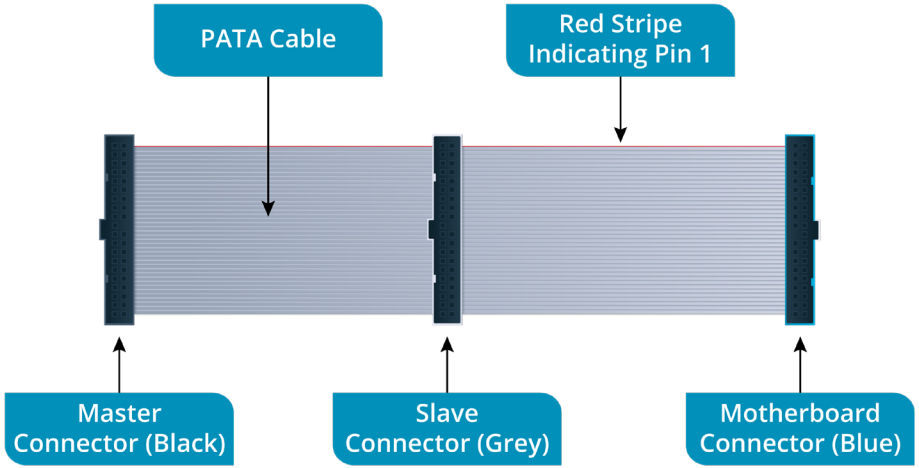
Integrated Drive Electronics Interface



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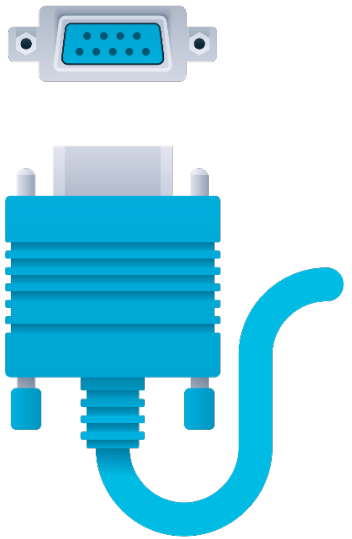
- Enhanced integrated drive electronics (EIDE) or parallel ATA (PATA)
- Channels
  - IDE1 (primary) and IDE2 (secondary)
- Devices per channel
  - Device 0 and device 1
- EIDE cable and connectors

Serial Cables

- RS-232 interface
- Low bandwidth
- DB-9 connector
- Software COM port
- PS/2 keyboard and mouse ports



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Adapter Cables

- Passive cables with different connectors on each end
- Active cables with circuitry to translate signaling between different interface types
- Video
  - HDMI to VGA, HDMI to DisplayPort, HDMI to DVI, …
- USB
  - USB-C to USB-A
  - USB hubs
  - USB to Thunderbolt, USB to Lightning

Review Activity: Legacy Cable Types

- Explain Legacy Cable Types
- DVI and VGA Video Cables
- Small Computer System Interface
- Integrated Drive Electronics Interface
- Serial Cables
- Adapter Cables

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Lesson 1

Summary