



Instructor Materials

Chapter 1: Introduction to the Personal Computer



IT Essentials v6.0

Cisco | Networking Academy®
Mind Wide Open™



Chapter 1: Introduction to the Personal Computer



IT Essentials v6.0

Cisco | Networking Academy®
Mind Wide Open™



Chapter 1 - Sections & Objectives

- 1.1 Personal Computer Systems
 - Explain how personal computer systems work together
- 1.2 Select Computer Components
 - Select appropriate computer components
- 1.3 Configurations for Specialized Computer Systems
 - Explain how hardware is configured for task-specific computers



1.1 Personal Computer Systems



Cisco | Networking Academy®
Mind Wide Open™



Personal Computer Systems

Cases and Power Supplies

■ Cases

- Influences the motherboard form factor choice
- Must allow for good air flow
- Available in different sizes

■ Power Supplies

- Provides power to all computer components.
- Must be chosen based on current and future needs.
- Deliver different voltage levels to meet different internal component needs.

■ Power Supply Wattage

- $P = V \times A$





Personal Computer Systems

Internal PC Components

- Motherboards
 - Backbone of the computer
 - Interconnects computer components
- CPU
 - The brain of the computer
 - Most processing is done by the CPU
- Cooling Systems
 - Dissipates the heat generated by computer components.
- Memory (ROM and RAM)
 - RAM: Stores data temporarily, aiding processing
 - ROM: Stores data permanently; often storing firmware and low level programs.





Personal Computer Systems

Internal PC Components (Cont.)

- **Adapter Cards and Expansion Slots**
 - Adapter Cards extend computer functionality
 - Adapter Cards connect to the motherboard through Expansion Slots

- **Storage Devices**
 - Designed to permanently store user data, user applications and the Operating System
 - Can be internal or external to the computer

- **Video Ports**
 - Connects a video system to an external display device such as a monitor or projector
 - Video systems are often designed as an adapter card.

- **General Ports**
 - Provide connectivity between the motherboard and various external devices such as printers, external storage and video cameras.





Personal Computer Systems

External Ports and Cables

- Video Ports and Related Cables
 - A few different standards govern video traffic between the computer and external video devices.
 - HDMI and displayPort are examples of video ports that require a specific cable to operate.
- Other Ports and Related Cables
 - Motherboards have a number of other ports used for device connectivity; USB is a common example.
- Adapters and Converters
 - Adapters and converters can be a solution if a motherboard does not have the proper port to connect to a device.
 - Adapters do not usually process the signal; they simply redirect it to another pin.
 - Converters are more likely to process and transform the signal, converting it to be accepted by an existing port.





1.2 Select Computer Components



Cisco | Networking Academy®
Mind Wide Open™



Select Computer Components

Select PC Components

- Select the Motherboard, CPU, Case and Memory
 - CPU, memory, motherboard and case choices are inter-related.
 - The motherboard should support all customer required applications and still fit properly in the case.
 - The case should host the motherboard, the proper power supply and provide good airflow for the internal components.
 - The CPU must be compatible with motherboard CPU slot and voltage; it should be compatible with the chosen memory speed for maximum performance.
 - The memory must also be compatible with motherboard memory slots and voltage.
 - The amount of memory will depend on the type of applications requested by the customer.





Select Computer Components

Select PC Components (Cont.)

■ Select the Case and Fans

- Case and fans must be chosen to maximize internal airflow.
- The fans must fit the case and be within the power limits provided by the power supply.



■ Select the Power Supply

- The power supply should be selected based on the maximum amount of power required by all the internal components.
- Remember that some components will draw more power while under heavy load.



■ Select Adapter Cards

- Make sure the motherboard has compatible expansion slots to support the adapter cards.
- The motherboard must also have enough expansion slots to receive all the required adapter cards.
- Customer needs will define what adapter cards must be procured and installed.





Select Computer Components

Select PC Components (Cont.)

■ Select Hard Drives

- Important hard drive factors to be considered are speed, storage space and communication interface type.
- The drive's underlying technology (HDD vs SSD) directly impacts speed.



■ Select a Media Reader

- The media reader must be compatible with customer media.



■ Select Optical Drives

- Make sure the drive is compatible with customer media.
- Other factors to consider are speed, communication interface type and the ability to write to the media.





Select Computer Components

Select PC Components (Cont.)

■ Select External Storage

- Important factors when selecting external storage are storage space, speed and communication interface.
- Make sure the computer has enough ports to accommodate the external devices and peripherals.
- **Note:** Some external devices do not require an external power supply but rely on a second USB port for power.



■ Select I/O Devices

- The selection of I/O devices is application specific and will depend on customer requirements.
- Make sure the computer has enough communication ports and that they are compatible with the types required by the I/O devices.





1.3 Configurations for Specialized Computer Systems



Cisco | Networking Academy®
Mind Wide Open™



Configurations for Specialized Computer Systems

Specialized Computer Systems

■ Thick and Thin Clients

- Thin clients have little processing power and are designed to act as a terminal to a server (thick client).
- Thick clients have more powerful CPUs, more memory and their own storage. They serve as processing stations for thin clients.

■ CAx Workstations

- Designed to support CAD and CAM applications.
- Plenty of RAM, fast disks, powerful CPU and special input devices are common resources.

■ Audio and Video Editing Workstations

- Common editing workstation resources include much RAM, fast disks, powerful CPU and special adapter cards such as audio and video capture.





Configurations for Specialized Computer Systems

Specialized Computer Systems (Cont.)

■ Virtualization Workstations

- These workstations are designed to run virtual computers
- Virtual computers use and share the workstation's physical resources such as CPU, memory and disks.
- The selection of physical resources will depend on the number and purpose of the virtual machines.

■ Gaming PCs

- Due to high resource requirements of modern games, gaming PCs are very resource demanding.
- A few requirements of gaming PCs are: top end CPU, lots of fast RAM, fast disks, high performance input devices and audio systems.

■ Home Theatre PCs

- These computers must be able to play various media formats and, in some cases, receive TV signals.
- Common HTPC requirements include powerful CPU, fast RAM, large disks, fast NIC and video card with TV input.





1.4 Chapter Summary



Cisco | Networking Academy®
Mind Wide Open™



Chapter Summary

Summary

- This chapter introduced the components that comprise a personal computer system and what to consider when choosing upgrade components.
- Information technology encompasses the use of computers, network hardware, and software to process, store, transmit, and retrieve information.
- A personal computer system consists of hardware components and software applications.
- The computer case and power supply must be chosen carefully to support the hardware inside the case and allow for the addition of components.
- The internal components of a computer are selected for specific features and functions. All internal components must be compatible with the motherboard.
- Use the correct type of ports and cables when connecting devices.
- Typical input devices include the keyboard, mouse, touch screen, and digital cameras.
- Typical output devices include monitors, printers, and speakers.
- Cases, power supplies, the CPU and cooling system, RAM, hard drives, and adapter cards, must be upgraded when devices fail or no longer meet customer needs.
- Specialized computers require hardware specific to operate. The type of hardware used in specialized computers is determined by how a customer works and what a customer wants to accomplish.

Cisco | Networking Academy[®]

Mind Wide Open[™]

