10.1.2 Component Selection Facts

If you are purchasing a new computer or building a new computer, you need to ensure that the hardware you select can accomplish the work that will be expected of it. In most organizations, a "one-size-fits-all" approach to selecting computing hardware simply won't work. You need to evaluate the role of the user who will use the system and then create a list of specifications that will ensure the hardware can fulfill that role.

This lesson covers the following topics:

- Graphics design or CAD/CAM workstation
- Audio/video editing workstation
- Virtualization workstation
- Gaming system
- Standard thick client
- Thin client
- Home or small office server

Graphics Design or CAD/CAM Workstation

For a graphics design or CAD/CAM workstation, select the most powerful processor that you can afford. Graphics and CAD/CAM applications require a great deal of processing power. A 64-bit multi-core processor should be the minimum processor considered. Implement a high-end video adapter with extensive amounts of video memory implemented. Graphics and CAD/CAM applications require a great deal of video processing. Implement the maximum amount of RAM supported by the motherboard in triple- or quad-channel mode.

Because of the extensive mathematical calculations used by the software on these systems, it is strongly recommended that ECC memory be used.

Audio/Video Editing Workstation

Select the most powerful processor that you can afford. Audio and video editing applications require a great deal of processing power. A 64-bit multi-core processor should be the minimum processor considered. Implement a high-end video adapter with a large amount of video memory and multiple display outputs. Audio and video editing applications require extensive video processing and screen space. Implement a high-end audio adapter and speaker system. Implement a very large, very fast hard disk drive. Audio and video editing applications require extensive disk space and speed.

You may want to consider using a combination of the following storage devices:

- A fast SSD drive for projects currently being worked on.
- A large HDD drive for archiving data and backing up the SSD drive.

Virtualization Workstation

Virtualization hosts require extensive RAM and CPU processing power. Each virtual machine running on the system must share the system processor and RAM; therefore, you need to implement the maximum amount of RAM supported by the motherboard in triple- or quad-channel mode. A 64-bit quad-core processor should be the minimum processor considered. You may want to consider an eight-core processor or a server system with multiple physical processor sockets. Video and audio performance are of secondary concern on a virtualization system.

Gaming System

Gaming applications require a great deal of processing power. A 64-bit multi-core processor should be the minimum processor considered. Gaming applications can cause the systems processor, RAM, and video adapter to generate excessive heat. You should implement a high-end cooling solution to dissipate this heat. Implement a high-end video adapter with a GPU. Gaming applications require a great deal of video processing. Implement a high-end audio adapter with a surround-sound speaker system.

Standard Thick Client

Make sure the hardware meets recommended requirements for running the selected operating system (such as Windows or Linux). Make sure the system has enough processing power, disk space, and RAM to support the desktop applications that will run on it. A standard thick client workstation should be optimized to run desktop productivity applications.

Thin Client

A thin client needs only to be able to connect to a remote desktop session. As such, it needs only to meet the minimum requirements for running Windows locally. A thin client workstation needs only to be optimized to run very basic applications. Install the fastest network adapter supported by the network it will be connected to. Gigabit speeds (or faster) are recommended. This will help ensure that the remote desktop session provides a reasonable end-user experience.

Home or Small Office Server

A home or small office server is typically used for media streaming, file sharing, and printer sharing. As such, you should install the fastest network adapter supported by the network it will be connected to. Gigabit speeds (or faster) are recommended. You should implement a storage solution that provides both speed and redundancy to protect data. You should consider using a RAID array that uses striping (for performance) along with mirroring or parity (for protection). RAID 5, RAID 1+0, or RAID 0+1 would be good choices. A 64-bit multi-core processor should be the minimum processor considered. Implement the recommended amount of RAM for your server operating system in triple- or quad-channel mode.

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