

Homework #1

1. A clustered system is a group of independent nodes, where each processor does not share memory with any other processor. To connect nodes you must use a network of some sort.

A multiprocessor system implies that the processors share a main memory space which facilitates the transfer of data between the processors. The processors generally do not share cache, but must have some sort of cache concurrency to maintain mutex validity.

2. The purpose of interrupts is to interface the hardware devices to the software programs. A trap is a type of interrupt triggered by the software. An example of a trap would be software telling the display device to display an image or in more modern systems the process by which the software shuts down the hardware.

3.a. The CPU merely needs to copy the data to the correct place in memory, as specified by the initial setup.

3.b. An interrupt is triggered at the completion of the operation.

3.c. The user process would need to be broken for the initial setup of the DMA operation. Also, there would be a break when the exit interrupt was triggered.

4.a. A LAN. Generally each computer would have a direct line to a central switch.

4.b. A LAN. Best practice would suggest that each floor is wired like the example in 4.a. with a gateway router for a single building. Each building router should be connected to a gateway router for the entire campus.

4.c. Mesh. Connect nearest nodes with dynamic routing.

4.d. Mesh. Connect nearest nodes with dynamic priority routing.

5. **Device Management:** Assists the user by abstracting the vast diversity of computer hardware available to them.

Process Management: Schedule, create, delete, and all the other operations to allow for running processes on the system.

Memory Management: Manage the memory available on the system. Create/delete/swap page-files or any other methods of memory management.

Command Interaction Shell: Graphical or text. Allows a user to execute commands to the computer through the operating system.