

1.12:

a.)

Two security problems that can occur in multiprogramming and time-sharing environment would be: 1.) If there is no method of protection between users, one user may be able to take, overwrite, or even delete it from the other user. 2.) Memory itself is finite & it might not be distributed evenly across all users or even allocated properly.

b.)

No, because there will always be the possibility of tinkering with the hardware. If we had separate computers, then there is no possibility of accessing my partition of the drive. If there is multiple users in the same system, users may have the ability to access the other users partition even if there is a restriction in users access, since they are running from similar drives.

1.15:

Symmetric:

There is only one kernel in symmetric processing and it's run by all cores. A single operating system runs on all processors which access a single image of the OS in the memory. Program appears to run in a single processor. Chip complexity is hidden and the performance gain from additional cores will decrease with more cores. Since intercore communication will eventually overwhelm the gain.

Asymmetric:

Each core has its own copy of a kernel which may be heterogeneous or homogeneous to other cores. Processor cores are unaware of each other. Separate OS images exist in main memory though they may share location for interprocessor communication. Resource sharing isn't under the hood and neither OS owns the processor. Asymmetric has a better advantage over symmetric because it requires less time handshaking between the cores.

Advantages of multiprocessor systems:

1. Offload tasks between cores increases throughput.
2. Shared resources, specifically memory would lower the cost of the system. Rather than having dedicated memory for each core, memory may be shared across all cores.
3. Reliability will increase, because if one core fails it would still run smooth and the only disadvantage to a failing core would be some loss of performance.

Disadvantage:

The biggest disadvantage to multiprocessor systems would be price. Silicon quality varies widely between processors and if transistors in a core break in the process; the processor may lose the amount of cores.

1.17:

Asymmetric clustering: One host runs the database while the other host monitors it. If the server host fails, then the monitoring one takes its place. It will not utilize the potential processing power of both hosts.

Parallel clustering: Database may run in parallel on both hosts. The problem with parallel clustering is the difficulty of providing a method of locking mechanism for files on a shared disk.

1.19:

Interrupts allows other instructions to occur without waiting for the current process to finish. This is important because without interrupts a process may run indefinitely. An interrupt is hardware generated while a trap is software. An interrupt may use I/O for signal completion and the CPU does not need to spend a cycle polling the devices for interrupts. A trap calls system routines to catch arithmetic errors.