

1.14

One case is when there is more than one user wanting to complete a computing task, a timesharing system services multiple users in a fashion that they all feel like they are the only ones on the system. Also if the hardware is fast enough to handle large tasks (tasks too large for a single computer to handle). Lastly this makes sense if money is a limiting factor, for instance it would be cheaper to implement a timesharing concept if some users utilize their computers infrequently than to buy each employee a PC.

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- a. The device driver loads registers within the device controller, these registers are read by the device controller to determine what action needs to be taken
- b. The CPU knows when operations are complete when an the device driver transfers a block of data from it's registers directly to memory (without CPU intervention) then an interrupt is generated. This is the primary benefit of DMA, only one interrupt is needed per block instead of per byte of data.
- c. Since both the device controller and CPU are competing for bus cycles, issues could arise if one of them gets greedy which would result in the system slowing down.

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A trap or commonly referred to as an exception is a software generated interrupt caused by an error or an attempt to perform a system-level activity. These exist to keep programs (and pesky developers) from inadvertently manipulating system resources and wreaking havoc, and causing other programs to execute improperly

2.18

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Shared Memory and Message Passing.

Message passing is more useful for exchanging smaller amounts of data because no conflicts must be avoided, also it is easier to implement. Message passing can also be slower due to it's utilization of system calls through which the kernel must intervene in the process, whereas shared memory only uses system calls to establish the shared memory regions then after that all traffic is treated the same.

2.23

Similarities:

Both provide developer frameworks

Both based upon existing kernels

Differences:

Android is open-source, iOS is not

Android is written in Java versus Objective-C

6.

- (1) variable a – data segment
- (2) variable b – stack
- (3) space pointed to by b – heap
- (4) variable c – stack
- (5) space pointed to by c – data segment
- (6) variable d – stack

7.

- (1)
- (2) system call
- (3)
- (4)
- (5) system call
- (6)
- (7) error
- (8) error

The program doesn't even compile