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OSSP

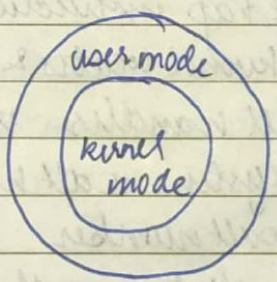
Tutorial 1

Ans1. Timeliness & resource utilization can contract each other.

Managing resources effectively can result in having longer wait time.

Ans2. • In kernel mode, the program has direct & unrestricted access to the system resources.
• In user mode, program does not have access to system resources. In order to access the resources, a system call must be made.

When programs running under user mode need hardware access for eg webcam, then 1st it has to go through kernel by using a syscall, and to carry out these requests the CPU switches from user mode to kernel mode at the time of execution. After finally completing the execution of the process the CPU again switches back to the user mode.



Ans3. (a) Disable all interrupts

Ans4. A trap is an interrupt generated by the CPU when a

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user-level program attempts to execute a privileged instruction or encounters an error.
When a trap occurs, the CPU transfers control to the kernel and executes a trap handler.
The trap handler checks the type of trap and takes appropriate action, such as terminating the program or performing a privileged operation on behalf of the program.

Ans5. Time multiplexing: CPU, network card, printer, keyboard
space multiplexing: memory, disk.

Ans6. It is not essential for both procedures doing the same operation to have the same name.
System call is more imp. as it has more privileges than library calls.

Ans7. Steps: 1-3: Push parameters, nbytes, & buffer, fd.
4: Call the library procedure read.
5: The library procedure put a code for read in a register.
6: Call trap instruction, trap to the kernel
7: The kernel locates & dispatches the system call handler via a table of pointers to system call handlers indexed on system call number.
8: The system call handler runs
9: Returns to the user space library procedure
10: The library procedure return to the user program.
11: The SP is incremented (pop up, as stack grows downwards) to clean up the stack.

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Ans 8. I would go for windows still as :

(1) due to its convenience and wide range of usage, I already have a windows pc.

(2) I wouldn't have the energy to unlearn and relearn all the process to start using linux system and make a habit of using Linux system.

(3) Instead of easy access, I would have to prefer cpad if I want to prefer linux. I'm not that pro of a coder that I would love to write a code for everything to get a speed faster than what is already provided by windows.

(4) From surfing the internet, what I gather is Linux is hard.

(5) (Hardware) ⇒ windows drivers are available for almost any hardware. Linux hardware support is still limited.

(6) Many apps like games, or Adobe photoshop etc are not available to Linux users.

Ans 9. Essential properties :

(1) Batch OS: Improves system utilization while decreasing the turn around time.

(2) Interactive OS: Allows user to directly operate with the computer. A user enters a command into the system & system executes it.

(3) Time sharing OS: To execute processes for a given time interval so that CPU utilization increases & it looks like various processes are being executed at the same time.

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④ Real time OS: To ensure good performance, the OS reads & reacts to sensor data & provides a response in a fixed time period.

⑤ Distributed OS: To connect users to resources & share them with other users in a controlled manner.

Ans 10. Open source software: eg. linux

Advantages:

① Cost effective: available for free without compromising the quality.

② Faster & more efficient: For programmers or other people who want their tasks to be run faster, open source softwares like linux offer that.

③ Community support: since, they are open source, there is a large community support.

Disadvantages:

① GUI not very friendly for new users. (not convenient to use like windows)
② Requires a lot of learning for usage.
③ Compatibility issues: not all open source OS are compatible with all hardwares & softwares.