

CSCI 3453: Operating System Concepts

HW Assignment # 2 Due

Date: February 7, 2021 @ 11:55 PM

1) What are the three main purposes of an operating system?

- Manages a computer's hardware
- Provides a basis for application programs and act as intermediary for the user
- Allocate resources to programs(CPU, Memory, I/O, storage, etc)/ provides an environment to run on

2) How does the distinction between kernel mode and user mode function as a rudimentary form of protection (security)?

The mode bit determines the current mode 0 for kernel and 1 for user. The system will switch back and forth depending on what sort of service is being executed. Having the two modes protects the OS from the user and the user from itself.

Some instructions can cause harm to the system. So the programmer called them privileged instructions that can only be instructed in kernel mode. If activated in user mode, the hardware will trap it

3) Which of the following instructions should be privileged?

- 1) Set value of timer.
- 2) Read the clock.
- 3) Clear memory.
- 4) Issue a trap instruction. - Done in user
- 5) Turn off interrupts.
- 6) Modify entries in device-status table.
- 7) Switch from user to kernel mode. - done in user
- 8) Access I/O device.

4) What is the purpose of system calls?

Allows a software triggered interrupt to process a request to a kernel service. It allows a user program to ask the operating system to perform a task for the OS on the users behalf . It provides an interface to the services made available by an OS. They can be written in C/C++ or assembly.

5) What is the main advantage of the layered approach to system design? What are the disadvantages of the layered approach?

Advantage: Simplicity of construction and debugging. Each layer hides existence of certain data structure, operations and hardware from higher level layers

Disadvantage: Defining functionality of each later and overall performance is poor

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Rubric for Grading:

Description	Points
Question 1	10
Question 2	10
Question 3	10
Question 4	10
Question 5	10
Total Points	50