

Homework 02

CS307-Operating System (D), Chentao Wu, Spring 2020.

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- (2.2) What is the purpose of the command interpreter? Why is it usually separate from the kernel?

Solution. The **purpose** of the command interpreter is to allow users to directly enter commands to be performed by the operating system. It reads commands from users or a file consists of commands, and executes them by transforming the commands to some system calls usually.

The command interpreter is an **interface** between users and operating system. To **protect the kernel** from some dangerous instructions which users may enter, the command interpreter should be separate from the kernel most of the time. ☐

- (2.5) What is the main advantage of the layered approach to system design? What are the disadvantages of the layered approach?

Solution. The main **advantage** of the layered approach is **simplicity of construction and debugging**. We can simplify the process of constructing and debugging by following the order of the layer number. And modifications in a layer only affect a few other layers, so it's easy to make modifications.

The **disadvantages** of the layered approach is as follows:

- It's hard to define the functionality of each layer appropriately.
- The overall performance of such systems is poor, because of the overhead of requiring a user program to traverse through multiple layers to obtain an operating-system service.

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- (2.7) Why do some systems store the operating system in firmware, while others store it on disk?

Solution. A disk along with a file system may **not** be **available** in some systems, so the operating system has to be stored in the firmware under this circumstance. ☐