

Midterm Exam: Operating Systems

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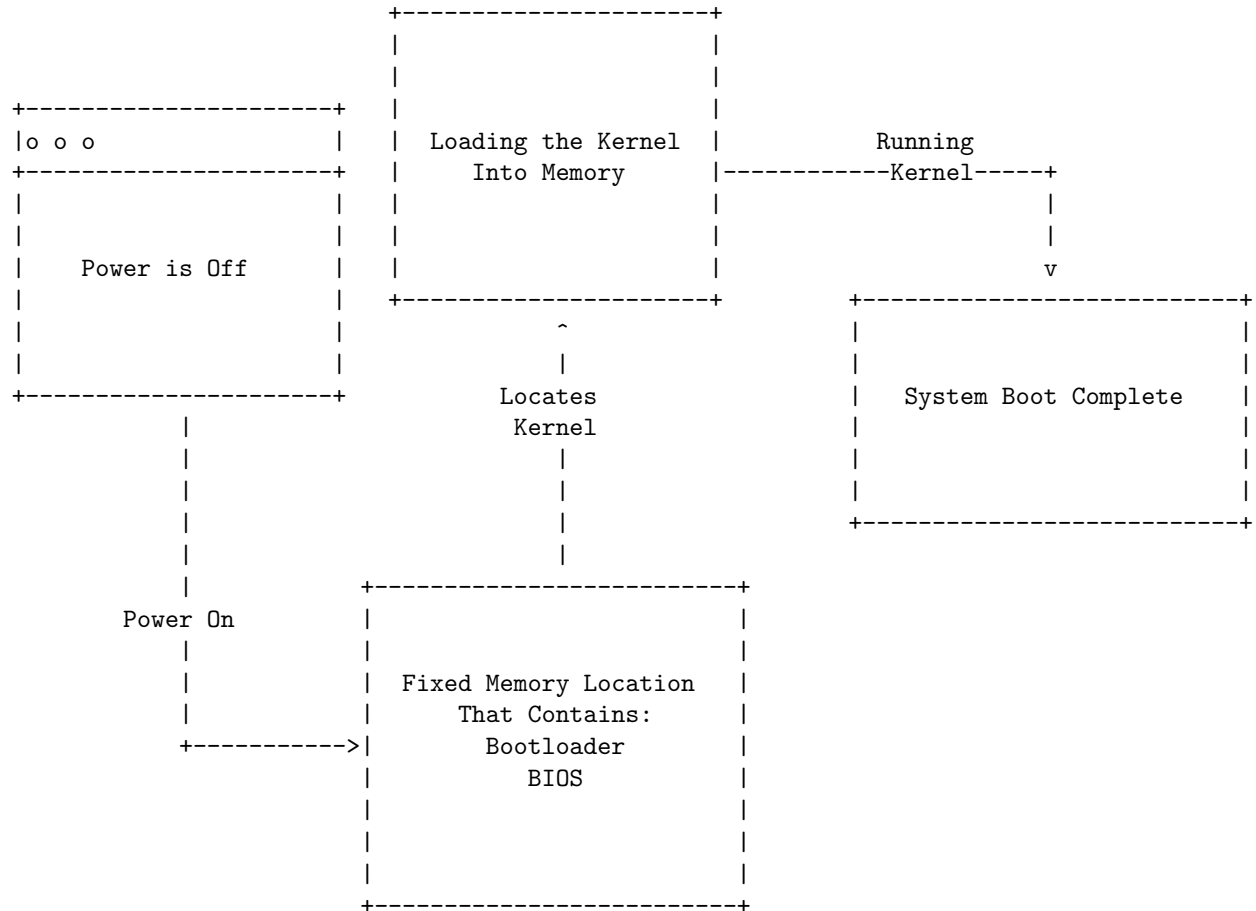
1 How does the kernel know if an application is in an infinite loop?

It can tell through the kernel and its interrupt driven hardware and software. It will catch it through an exception or trap.

2 Linux file has three levels of security associated with it that matches the three classes of users that may access that file. What are those?

- Owner
 - Read
 - Write
 - Execute
- Group
 - Read
 - Write
 - Execute
- Other
 - Read
 - Write
 - Execute

- 3 All computers follow roughly the same set of steps to transition from a power-off state to a running state. Can you enumerate the steps of the booting sequence?



4 Output redirection in Linux/UNIX system. We use > as well as >> as the output direction. What is the semantic difference between the two option switches?

You take the output of a program and write it to a file the manner in which is done is discussed below.

- > This is used for writing to a file and if the file already exist it will overwrite it.
- >> This is used for writing to a file and if the file already exist it will append to the file.

5 What does the command `chmod 765 foo` tell the computer to do?

Chmod is a program that defines the permissions of files and directories.

7: Owner Read Write and Execute

6: Group Read and Write

5: Other Read Only

So the command means that the owner has full access, group only read and write and the others group only read only.

- 6 What do you mean by big-endian and little-endian system?
- 7 Keeping in mind the various definitions of operating system, consider whether the operating system should include applications such as web browsers and mail programs. Argue both that it should and that it should not, and support your answers.
- 8 Explain the difference between a batch processing and multiprogramming.
- 9 What is the purpose of the UNIX pipe command, i.e., vertical bar character |
- 10 Which of the following scheduling algorithms could result in starvation?
- 11 What do you know about BIOS? In the class we discussed that PC/BIOS PROM monitor is rather limited in its ability to access the system hardware. What new standard is being proposed to replace the traditional legacy BIOS?
- 12 What is the purpose of interrupts? What are the differences between a trap and an interrupt? What is the use of each function? How are multiple interrupts dealt with? Can traps be generated intentionally by a user program? If so, for what purpose?
- 13 What is the purpose of system calls, and how do system calls relate to the OS and to the concept of dual-mode (kernel mode and user mode) operation?
- 14 Why do some operating systems store the operating system in firmware, while others store it on disk?