

CSC369 Week 2 Notes

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1 System Calls

- Bootstrapping
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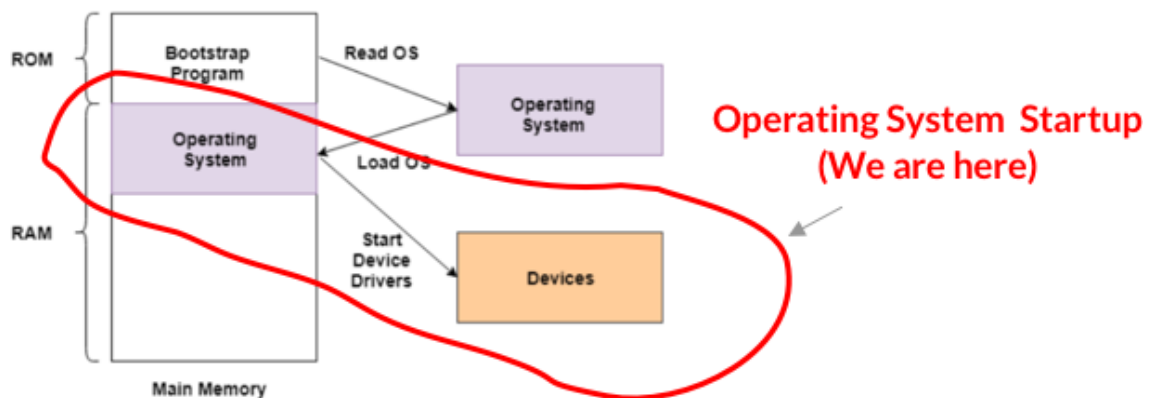


- * executes **Bootstrap Program**
 - is the first code that runs when the computer system is started
- * Entire operating system depends on the bootstrap program to work correctly
- * Locates and loads kernel (code of operating system) onto RAM
 - kernel = code of the operating system
 - kernel is in HDD
- * Bootstrap program is in ROM
- ROM
 - * is called **read-only-memory**
 - * Is also called **BIOS chip** (Basic Input/Output System)

- * is non-volatile
- * is stored in motherboard



- Operating System Startup



- Initializes OS

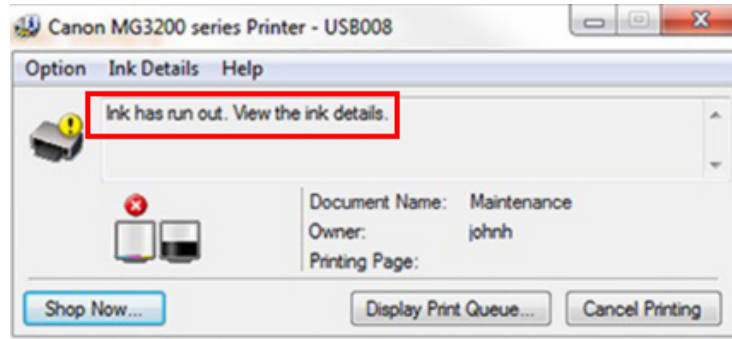
- * Initialize internal data structures
- * Create first process
- * Switch mode to user and start running first process
- * Wait for something to happen

- Requesting OS Services

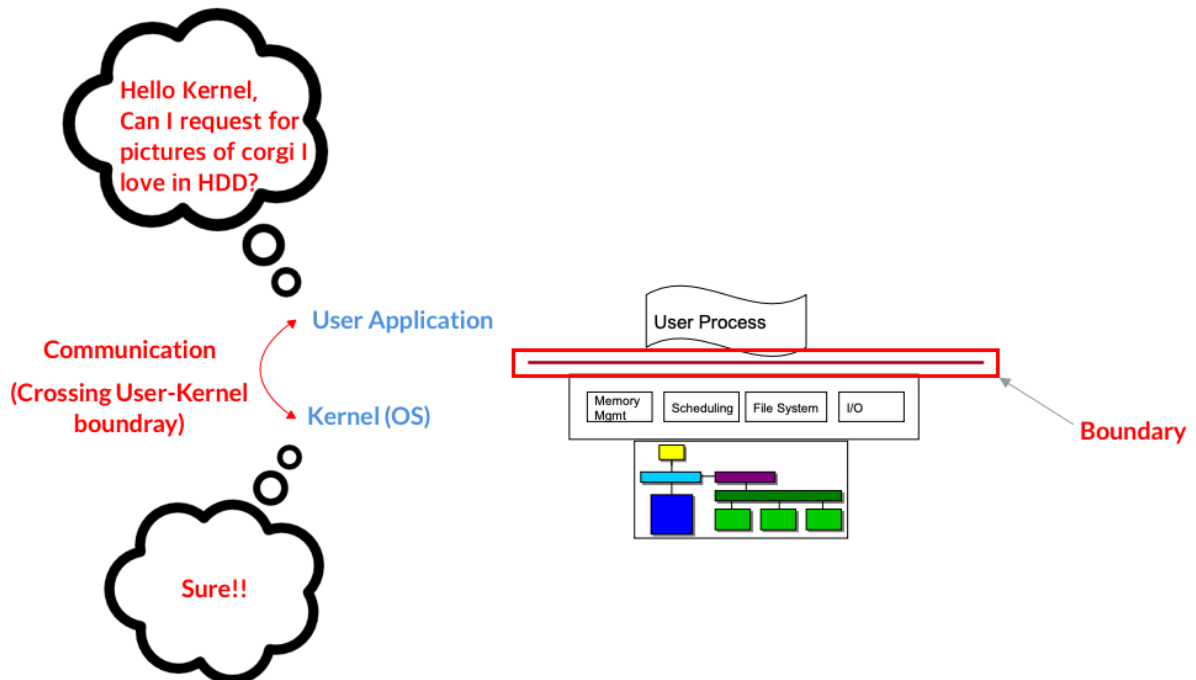
- Some services offered by OS are:

- * Program execution
 - Loading program to memory and executing program

- * I/O operations
 - Keyboard, mouse, speaker
- * File system manipulation
 - Reading and writing files and directories
- * Error Detection
 - Error that pops up when printer ink is empty



- Operating system and user programs are isolated
- How do they communicate?
- Boundary Crossings



- Boundary
 - * Is the line between user applications and kernel

- * Data is difficult to move back and forth between this line
- Boundary Crossings
 - * Is the communication that occurs between a program and kernel
 - * Communication occurs by sending data from one program into kernel, and then back
- More can be found here
- System Calls for Process Management
 - Major system calls

Call	Description
<code>fd = open(file, how, ...)</code>	Open a file for reading, writing, or both
<code>s = close(fd)</code>	Close an open file
<code>n = read(fd, buffer, nbytes)</code>	Read data from a file into a buffer
<code>n = write(fd, buffer, nbytes)</code>	Write data from a buffer into a file
<code>position = lseek(fd, offset, whence)</code>	Move the file pointer
<code>s = stat(name, &buf)</code>	get a file's status information

- Wait, System Calls?

System Calls are interrupt signals sent by software

- * Is a programmatic way of a program requesting for service to kernel of operating system
- * It's like 'Hey CPU, could you stop doing some operations for a moment and do *y* instead? It's really important'
- * i.e. Accessing a hard-disk drive

- System Calls for File Management