CSC 452 Review 1

Operating Systems Have 2 main jobs

Manage Resources

Abstract Details

System Resources

Processing Time - CPU and GPU time

Random Access Memory - RAM

Persistent Memory - Hard drives and SSD’s

Network Connection - Ethernet, Wifi, and Bluetooth Bandwidth

Abstract Details

Audio - USB speaker, 3.5mm earphones, bluetooth headset

Internet Socket - Wifi, Ethernet, USB

Print Document - Ink Printer, Laser printer

Give the illusion that every process has exclusive access to all of a systems resources.

The Operating System

The Operating system is just a program that runs in a privileged mode. With this privilege the OS monopolizes a systems resources.

The Operating System decides whether or not a process gets access to resources.

User Process

A User Process is created by a program that *usually* the user of the system opens.

A User Process does not have access to the hardware of the system, It can not open/read/write files, allocate memory, play audio, start new programs, ect. Because it is not a privileged process, It is not allowed to.

However we want our programs to be able to perform these privileged tasks.

Communication

The Operating System and the User Process need to be able to communicate to each other.

The User Process wants the ability to ask the Operating System for access to resources that require privileged permissions.

The Operating System wants the ability to signal a User Process when important events occur.

Interrupts

Interrupts - Interrupts literally Interrupt the flow of the processor, and perform a context switch to the Kernel Process, This also changes the permission register to Privileged.

Software Interrupt (Trap) - This is an Interrupt that is evoked by a User Process.

For example when a System Call is invoked

Hardware Interrupt - This is an Interrupt triggered by hardware

For example when a Divide by Zero exception is thrown

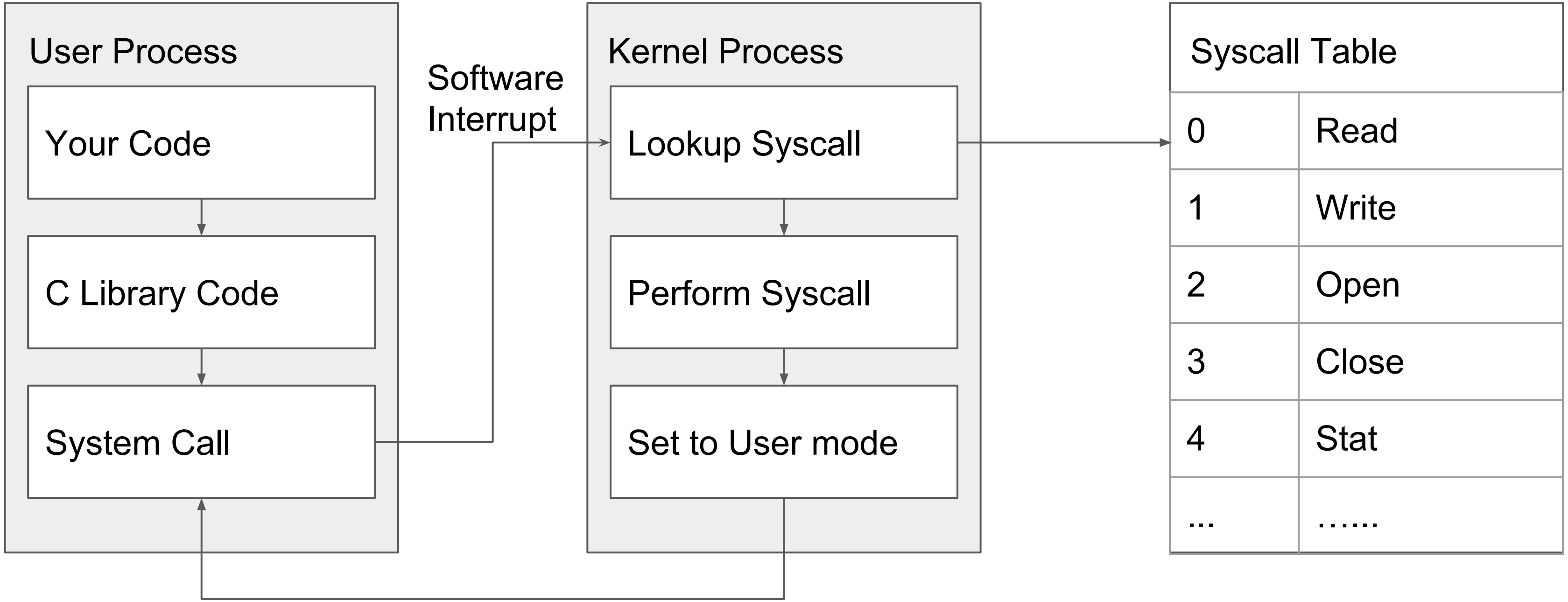
Signals

Signals are received by processes and usually call for the termination of the process.

Signals can be sent by the Operating System, or other User Processes.

Some Signals can be caught, and recovered from.

Communication Simplified (System Calls)



Syscall Table	
0	Read
1	Write
2	Open
3	Close
4	Stat
...	…...

* Technically, whenever an Interrupt, Software or Hardware occurs, it looks up a function in an Interrupt Vector first, a code of 128 represents a syscall.