URBAN EDGE

19/10/21

Assignment - 1

Boot Process — 6 stages

Power up / Reset

System startup

BIOS - Basic i/p/o/p system executes MBR

MBR - Master Boot Record executes GRUB

GRUB - Grand Unified Bootloader executes Kernel

Kernel - Kernel executes /sbin/init

Init - Init executes runlevel programs

Runlevel - Runlevel programs are executed from /etc/rc.d/rc*.d/

BIOS: Basic Input/Output System

- → Performs some system integrity checks
- → Searches, loads & executes boot loader program
- → It looks for boot loader in floppy, cd-rom or hardware
- → BIOS loads & executes MBR loader

MBR:

- → Master Boot Record loader & executes GRUB boot loader.
- → Its located in 1st sector of bootable disk
- → MBR is less than 512 bytes in size and has 3 comp.

GRUB:

- → GRUB stands for Grand Unified Bootloader.

URBAN EDGE

→ GRUB displays a splash screen, wait for few seconds, if we don't enter anything it loads the default kernel image as specified in the grub grub configuration file.

Kernel

→ Mounts the root file system as specified in the "root=" in grub.conf
→ Kernel executes the /sbin/init program
→ initrd stands for Initial RAM Disk

Init

→ Looks at the /etc/inittab file to decide the Linux run level
→ Following are the available run levels
  > 0 – halt
  > 1 – Single user mode
  > 2 – Multiuser mode
  > 3 – Full multiuser mode
  > 4 – Unused
  > 5 – X11
  > 6 – Reboot
→ Init identifies the default initlevel from /etc/inittab and uses that to load all appropriate program

Runlevel Programs

→ When the Linux system is booting up, you might see various services getting started. For example, it might say "Starting sendmail .... OK"
→ Depending on your default init level setting, the system will execute the programs

URBAN EDGE

Functions of Operating System

1) Security

→ The operating system uses password protection to protect user data and similar other techniques. It also prevents unauthorized access to programs and user data.

2) Control over system performance

→ Monitors overall system health to help improve performance.
→ This can help improve performance by providing important information needed to troubleshoot problems.

3) Job accounting

→ Operating System keeps track of time and resources used by various tasks & users, this information can be used to track resource usage for a particular user or group of users.

4) Error detecting aids

→ The operating system constantly monitors the system to detect errors and avoid malfunctioning of a computer system

5) Co-ordination b/w other s/w & users

→ Operating systems also coordinate and assign interpreters, compilers, assemblers and other s/w to the various users of the computer systems.

6) Memory Management

→ The operating System manages the Primary Memory or Main Memory. Main
→ It keeps track of primary memory

7) Processor Management

→ In a multi programming environment, the OS decides the order in which processes have access to the processor.
→ Keeps track of the primary Memory states of process

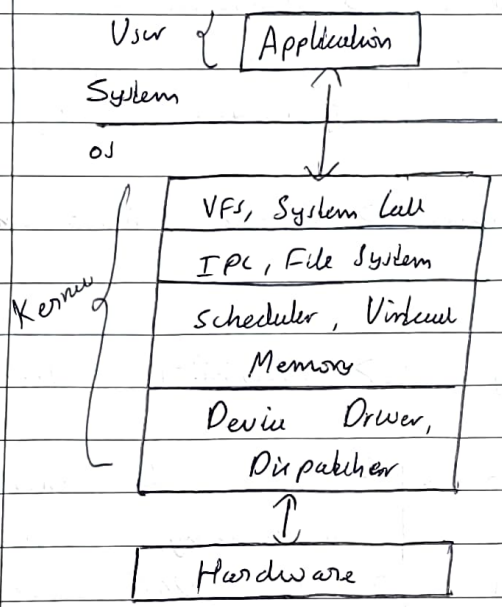
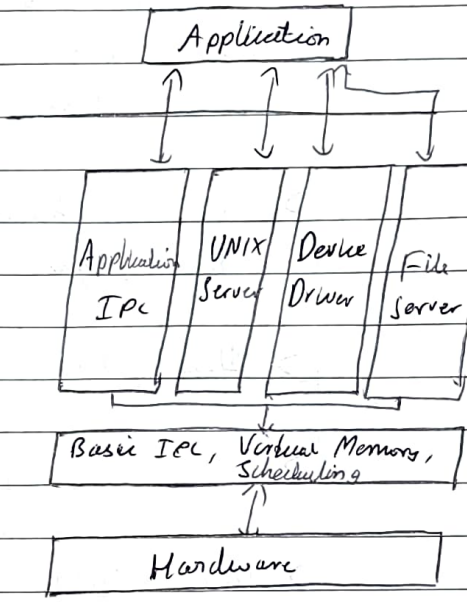
8) Device Management

→ An OS manages device communication via their respective drivers.
→ Keeps track of devices connected to the system.

9) File Management

→ A file system is organized into directories for efficient or easy navigation and usage.

3) With a neat diagram. Explain the difference b/w Monolithic & Micro kernel

Type: Monolithic	Microkernel
	
> Larger in size	> Smaller in size
> Fast execution	> Slow execution
> Hard to extend	> easily extendible
> In monolithic kernel, both user services & kernel services are kept in separate same address space	> In microkernel user services and kernel services are kept in seperate address space
> Less code is required	> More code is required
> Ex:- Linux, Solaris, BSDs., OpenVMS	> QNX, Symbian, L4Linux, Singularity, HURD

URBAN EDGE

Difference b/w UEFI & Legacy boot

Legacy Book	UEFI
> Legacy Boot is the boot process used by BIOS firmware	> UEFI stands for Unified Extensible Firmware Interface.
> slower bootting compared to Legacy Boot	> Faster Boot time
> ~~More~~ Less User Friendly	> ~~Less~~ More User friendly
> Uses the MBR partition	> Uses the GTP partitioning scheme.
> Uses BIOS firmware for Boot process	> User UEFI firmware for boot process.

URBAN EDGE

5) Discuss on the operating System Linux, Windows & Mac OS.

	Linux	Windows	Mac OS
>	Open Source	> Closed Source	> Closed Source
>	Does not have a specific registry of its own	> Registry is a master database which it stores all the settings	> Stores all application settings in a series of plist files.
>	Provides terminal	> Terminal is command prompt	> Provides console as terminal
>	Easy to switch interfaces	> Not interchangable interface till windows 8	> has a facility to bridge virtual network interfaces.

6) Commands on Windows OS to check disk partition

Step1 : Open Command prompt
Step2 : Use diskpart command.

Active : Mark the selected partition as active.
Add : Add a mirror to a simple volume.
Attributes : Manipulates disk / Volume attributes
Break : Break a mirror set
Clean : Clear information off the disk
Delete : Delete an object
Detail : Details of an obj object
Extend : Extend a volume
Import : Import disk groups

URBAN EDGE

7) List the commands to check services in windows.

= → Open Command prompt
↳ services.msc
↳ Press enter.

8) List the steps to check disk partitions in windows

Step 1: Open File Explorer
Step 2: Right click on "This PC"
Step 3: Choose 'Manage' from the pop-up menu
Step 4: Navigate to storage → Disk management in navigation panel

9) List the steps to start or stop services in windows

= Step 1: Hit Windows key + R to open the run window.

Step 2: Type in services.msc in the open: box

Step 3: Service dialog box / window will open

Step 4: Select the service to start / stop

Step 5: Choose the relevent option to operate

URBAN EDGE

find : Search for files in a directory hierarchy
find -H : Lists all the files

cut : Removes section from each line of file
-b bytes cut -d -b 1, 2, 3 f1.txt
-d

grep : To search for pattern in each file
grep Add f1.txt

# sed : stream editor for filtering and transforming text
$ sed 's/unix/linux/' filename
replace this / with this

sort : Writes sorted concatenation of all files to standard output
sort -n filename

head : output the first part of files
head filename.txt

tail : output the last part of files
tail file.txt
tail -n 2 file.txt

# fdisk : manipulate disk partition table
$ sudo fdisk

# journalctl : used to query the contents of the systemd as written by systemd-journald.service
$ journalctl

URBAN EDGE

#crontab : is prog used to install, uninstall or list the tables used to drive the cron daemon in vixie cron.

#dmesg : print or control the kernel ring buffer . Its also called "drivemsg".

dmesg | less
dmesg | grep "text to search"

#tail : Outputs last 10 lines of the file
$ tail el.txt