LDS Assignment

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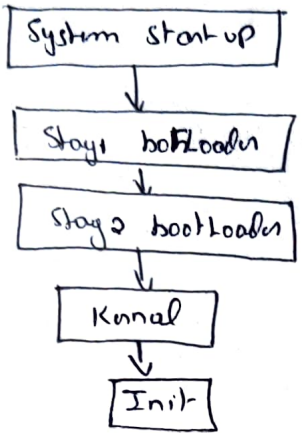
1) Booting Process



Bios / Boot monitor

MBR (master boot Record)

LILO, GRUB etc

Linux

user-space

1. System Startup → when a system is first booted / reset, it executes code at a well known location in PC-BIOS stored on a flash memory on motherboard.

→ Bios is a small piece of code (512 bytes) - 1st prog to run

→ Bios identifies dev (boot device) which is bootable & active

→ From this dev, Linux is booted where MBR contains primary boot-loader

MBR loaded into RAM, Bios yield control to it

2. Stage 1 Boot Loader: → job is to find and load secondary boot loader

→ MBR load this stage 1 bootloader

3. Stage 2 boot loader: → Also called as kernel loader its task is to load the linux kernel

→ 1st & 2nd stage boot loader combined are called LILO (Linux loader) or GRUB (grand unified Boot Loader)

→ file system is consulted & start kernel image & initrd image are loaded into memory

(2)

4. Kernel -> At the head of the kernel image, a routine does some hw setup & decompresses the kernel image & places it in high memory

-> Kernel image is called & kernel boot begins

-> During this initrd is copied into RAM & mounted this acts as temporary root file system in RAM

5. Init -> Kernel starts the first user space application

-> compiled into c library

-> first prog /sbin/init.

(2) Functions of OS

01) Security:

- protect user data

-> It prevents unauthorized access to program & user data

02) Job accounting

-> OS keeps track of time & resources used by various tasks.

03) Error detecting aids

-> constantly monitors the system to detect errors & avoid malfunctioning of system.

04) Co-ordination b/w HW & user

-> OS co-ordinate & assign interpreter, compiler, assembler

05) memory management

-> The OS manages the primary memory

-> It keeps track of memory which bytes are used by which prog

-> Allocate memory for the process deallocate when the process has terminated.

(3)

6) Process management

-> OS decides the order in which the process have access to the processor

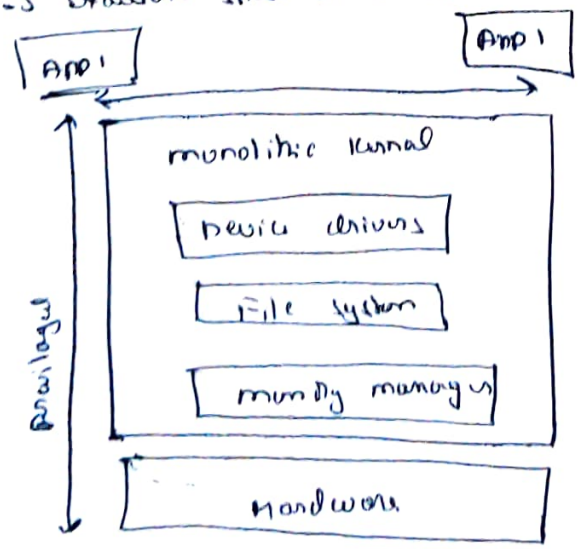
-> Keeps track of the status of process

07) File management

-> A file system is organised into directories for efficient navigation & usage

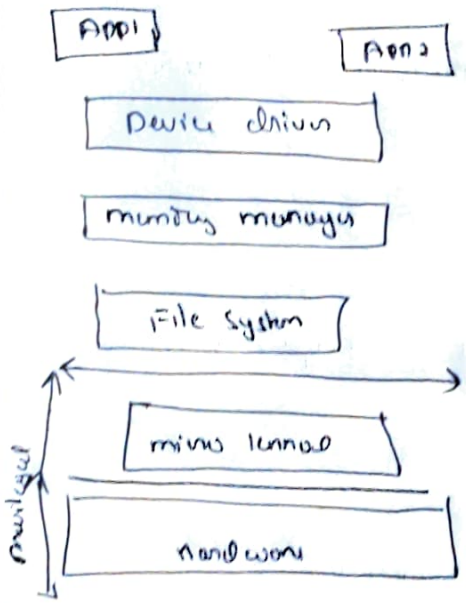
3) monolithic & micro kernel difference with diagram

micro kernel	monolithic kernel
-> user services & kernel are kept in separate address space	+ Both user servers & kernel services are kept in same address space
-> OS is complex to design	+ OS is easy to design & implement
-> micro kernel is small in size	+ monolithic kernel are larger in size
-> easier to add new functionality	+ Difficult to add new functionality
-> failure of one component doesn't affect the working of micro kernel	+ failure of one component leads to failure of service
-> execution speed is slow	+ Execution speed is high



monolithic kernel

(5)



mini kernel

(6)

UEFI & legacy boot

→ UEFI stands for unified extensible firmware interface most new motherboard
contain of this type it
it has more advantage than using BIOS

most importantly it provides user friendly graphical user interface (GUI)
BIOS provides this since BIOS cannot recognise large storage drives
UEFI provides a good alternative

→ In legacy BIOS that uses the keyboard to select the option UEFI allows
controls via mouse.
UEFI contains secure boot.

→ legacy BIOS used by BIOS firmware it stores a list of installed storage
devices that are bootable.
BIOS performs post (power on self-test).

5) Commands on windows to check disk partition

-> open power shell terminal

-> Type diskpart

-> `Diskpart > list disk`

↳ It will list many detected disks

-> `DISKpart > list volume`

↳ It will list detected volumes

-> `Diskpart > list partition`

↳ This will list the current partitions on the device.

06) commands to check services in windows

-> List all services

> sc query type = service state = all

-> Search for specific service

> sc query type = service state = all | find ! ? "service name" : my service.

07) steps to start & stop services in windows

Stop service

-> open start

-> Search services

-> click on the service you want to start

-> click start button

-> ~~Apply~~ button

Stop service

-> open start

-> Search services

-> click on the service you want to stop

-> click stop

-> click apply