Operating System

Lab – 10

Objectives:

1. Understanding the concept of mount point in Linux, and mounting and unmounting file systems
2. Understanding the structure of UNIX file system

Resources:

- Video Lecture 19: https://youtu.be/HootdM9BgZw?si=5RbMCD1YleYj1rXp
- Video Lecture 20: https://youtu.be/58WJZbcNj2E?si=u1lSvl-0g14vCjxT

Task 1:

- Describe what do you mean be mount point by drawing a diagram of a tree showing mounted and unmounted file system.
- Give **`mount`** command on shell without any argument, what information it displays, use man page to describe each line of information. Mention two files which also contains the same information that mount command displays. Confirm
- Write down a command that displays a list of all available block devices attached on your system. Use **`man`** page and write down the sample output on your copies. Do describe each entry.
- Review the contents of the file **`/proc/partitions`**, use the **`man`** page of **`proc`** to understand its contents
- Review the man page of **`fstab`** in section 5 and write at least one line description each of its six fields on your note book. Be ready to answer questions of TAs
- Write down a shell command that mounts the USB attached with your system in a directory named **`myusb`** in your home directory.
- Write down a shell command that displays all the commands available on your system in the **`/sbin/`** directory having string **`fsck`** in between. After you see these commands use man page to describe difference between **`e2fsck`** command and **`fsck.ext3`**

Task 2:

- Draw the schematic view of UNIX file system with a hard disk showing its linear view and give details of a single partition of your hard disk, showing different data blocks and other related blocks used by operating system for management purposes. Do mention the usage of these blocks.
- Draw the schematic view of a UNIX inode block showing its contents particularly the thirteen pointers with data blocks in detail. What will be maximum file size support in a UNIX system that has 1KiB block size and each disk pointer occupies 4B of space.
- When a user creates a file on the disk, what are the steps that are followed by Linux kernel to populate different data structures on the hard disk. Describe by drawing and labeling diagram showing contents of directories involved. Get ready to answer viva questions of TAs as to how a file is searched and read by different programs like `cat`.
- Write down a shell command that displays a detailed list of file system parameters on your Linux file system, like Mount point, UUID, magic number, free blocks, free inodes, first block address, block size of the first partition of the first scsci hard disk attached with your system.
- Write down a brief usage of **`df`** and **`du`** command by giving some sample usage on your note books.
- Write down a shell command that displays the list of files that your terminal has currently opened.
- Write down a shell command to which you pass a file name e.g, `/etc/passwd` and it tells you which all processes have that file opened.