Operating System

Lab – 09

Objectives:

1. Understanding the concept of HDD geometry, CHS and LBA addressing
2. Importance of partitions, and different types of partition tables
3. Details of MBR partitioning scheme
4. File systems and formatting a partition

Resources:

- Video Lecture 16 (Disk Geometry): https://www.youtube.com/watch?v=JNKhmSynRVM
- Video Lecture 17 (Disk Partitioning): https://www.youtube.com/watch?v=N-rrmeP1O2g
- Video Lecture 18 (Disk Formatting): https://www.youtube.com/watch?v=2w_kdcdVRMo

Task 1:

- Write down the difference between a spinning disk and a solid state disk?
- Define Logical Block addressing? What is the maximum disk size support on a 24 bit LBA and on a 28 bit LBA?
- What do you mean by a hard disk interface? Mention features of some of important HDD interfaces.
- Explain how reading and writing of a CHS disk is performed and differentiate between seek time and rotational delay? Describe how the mapping of CHS to LBA reduces seek time.

Task 2:

- Write down five advantages of partitioning your hard disk.
- Differentiate between primary partition and logical partition.
- What do you mean by a partition table? Draw a detailed schematic view of the partition table of your hard disk.
- Give a shell command that displays boot signature of your hard disk.
- Give a shell command that displays the stage 1 boot loader program on your hard disk.
- Give a shell command that displays the partition type of the first partition of your hard disk.
- Mention at least five different partition types along with their numbers that your system supports.
- Use **`fdisk`** command to create two primary and six logical partitions on your system, with appropriate sizes and mount points. Justify during viva.

Task 3:

- Define file system and journaling filesystem. Name the functionalities that a good file system must offer.
- Give command that displays the list of currently loaded file system drivers, and write the output.
- Mention the max file size support and maximum partition size support of **`ext3`**, **`ext4`**, **`vfat`**, **`ntfs`**, and **`zfs`.**
- Give a shell command to display the name, type, fstype, parttype, size, and mode of the hard disk attached with your system. Write down a snap shot of the output and describe to TAs.
- Give a command to assign a label "**pucit9**" to the first logical partition of your only attached **`scsi`** hard disk, and later give a command to undo it.
- Give a command to format the second partition of the second **`scsci`** hard disk attached with your system to **`ntfs`**. Later give a command to confirm.