

**GETTING STARTED
WITH
LOCAL STORAGE**

➤ **DISKS & PARTITIONS:**

- Disk partitioning is one of the many steps you must take when preparing a new system for use.
- Partitioning means to divide a single hard drive into many logical drives that allows you to store data on them.
- The hard disk stores information about the location and size of each disk partition in the partition table. Using information from the partition table, the operating system treats each partition as a logical disk.

ADVANTAGES:

- Reduce the likelihood of administrative oversights of Physical Volumes
- Ensure sufficient backup
- Provide efficient disk management

❖ **DISK IDENTIFICATIONS:**

- Different types of disks will be having different initials in Linux.
 - **IDE** drive will be shown as : **/dev/had**
 - **SCSI/SATA** drive shown as : **/dev/sda**
 - **VIRTUAL** drive shown as : **/dev/vda**
 - **CLOUD** drive shown as : **/dev/xvda**
 - **NVME** drive shown as : **/dev/nvme0n1**

NOTE: Here the first two letters represent the type. The third letter represents position of the hard disk. If there is a number in ending, it is the number of the partition.

→ **To view information about the current partition layout:**

```
#cat /proc/partitions
```

```
#cat /proc/partitions | grep -i nvme
```

(or)

```
#fdisk -l
```

(or)

```
#lsblk
```

❖ CONSIDERATIONS BEFORE PARTITIONING ON A DISK:

- Before creating, removing, or resizing any disk partitions, consider the following aspects.
- On a device, the type of the partition table determines the maximum number and size of individual partitions.
- Using **parted** and **fdisk**, you can create, modify, delete, and view disk partitions.
- The following are the partitioning layout standards:

MASTER BOOT RECORD (MBR):

- It is used with **BIOS-based computers**. You can create primary, extended, and logical partitions.

Maximum number of partitions:

- Up to **four primary** partitions.
- Up to **three primary** partitions, **one extended** partition
- **Multiple logical** partitions within **the extended** partition

Maximum size of Partitions:

- **512b sector drives**, the maximum size is **2 TiB**.
- **4k sector drives**, the maximum size is **16 TiB**.

GUID PARTITION TABLE (GPT):

- It uses **Globally Unique identifier (GUID)** and provides unique disk and partition GUID.

Maximum number of partitions:

- Up to **128 partitions**, if using the **parted utility**.

Maximum size of Partitions:

- **512b sector drives**, the maximum size is **8 ZiB**.
- **4k sector drives**, the maximum size is **64 ZiB**.

COMPARISON OF PARTITION TABLE TYPES:

- To enable partitions on a device, format a block device with different types of partition tables.
- The following table compares the properties of different types of partition tables that you can create on a block device.

Partition table	Maximum number of partitions	Maximum partition
Master Boot Record (MBR)	4 primary, or 3 primary and 1 extended partition with 12 logical partitions	2TiB
GUID Partition Table (GPT)	128	8ZiB

❖ GETTING STARTED WITH PARTITIONS:

- Use disk partitioning to divide a disk into one or more logical areas which enables work on each partition separately.
- The hard disk stores information about the location and size of each disk partition in the partition table.
- Using the table, each partition then appears as a logical disk to the operating system. You can then read and write on those individual disks.

MANAGING PARTITIONS USING FDISK:

- **fdisk** utility can manipulate disk partitions.
- It has a huge number of functionalities such as print, create, delete...etc.

SYNTAX: **#fdisk [Options] <Device_Name>**

→ To Listing / viewing Partitions:

#fdisk -l

#lsblk

CREATE A NEW PARTITION:

- Start the interactive **fdisk shell**:

```
#fdisk [options] block-device
```

```
#fdisk /dev/nvme0n1
```

Help Options:

m	: Help options
p	: Print partition table
l	: list known partition types
n	: Add a new partition
d	: Delete a partition
w	: Write change to disk
t	: Change partition id value
q	: Quit without saving changes

(Command m for help): **n**

Partition number (6-128, default 6): **6**

First sector (52430848-125829086, default 52430848):

Last sector, +/-sectors or +/-size{K,M,G,T,P} (52430848-1258): **+3G**

(Command m for help): **p**

(Command m for help): **w**

Now that new partition has been created and written to disk.

PARTPROBE:

- `partprobe` was commonly used in RHEL to inform the OS of partition table changes on the disk. In RHEL, it will only trigger the OS to update the partitions on a disk that none of its partitions are in use (e.g. mounted).

```
#partprobe /dev/nvme0n1
```

```
#fdisk -l
```

DELETE A PARTITION:

- To remove a partition using fdisk, you need to enter the command prompt for fdisk on the disk you are removing from.

```
#fdisk /dev/nvme0n1
```

```
Command (m for help): d
```

```
Partition number (1-6, default 6): 6
```

```
Command (m for help): p
```

```
Command (m for help): w
```

```
#partprobe /dev/nvme0n1
```

```
#fdisk -l
```

NOTE: I highly recommend that you check out the **fdisk utility** for yourself. There is no better practice than firing up a virtual machine / disks / partitions and playing in the filesystem.

PARTITION IDENTIFIERS:

- Each partition of your disk has an identifier. It's written in the partition table which is in the MBR if it's a disk based on the standard Msdos partition table.
- This is just a number which says which sort of partition it is.
- You can get the list of all the possible partition identifiers that can be used in an msdos partition table by typing "L" in fdisk under linux:

```
#fdisk /dev/nvme0n1
```

```
Command (m for help): l
```

```
Command (m for help): t
```

```
Partition type or alias (type L to list all):
```

```
Partition number (1-6, default 6): 83
```

```
Command (m for help) : w
```

```
#fdisk -l
```

```
#lsblk
```