***02 Block Driver***

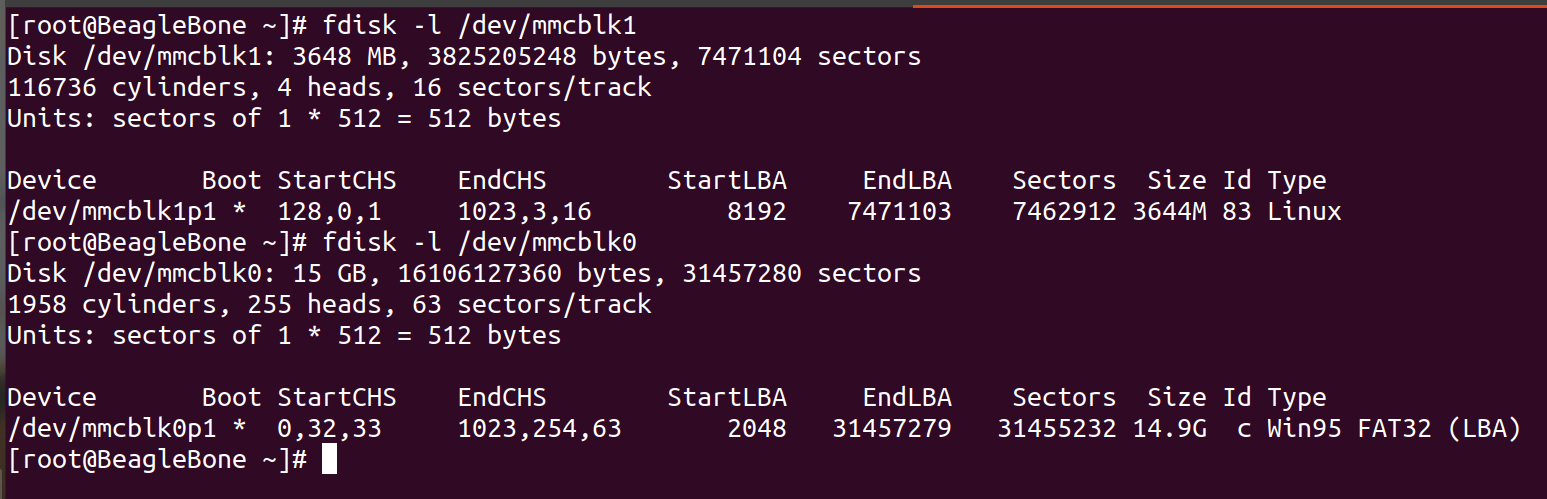
What to Expect

● Why the need for the Block Layer?

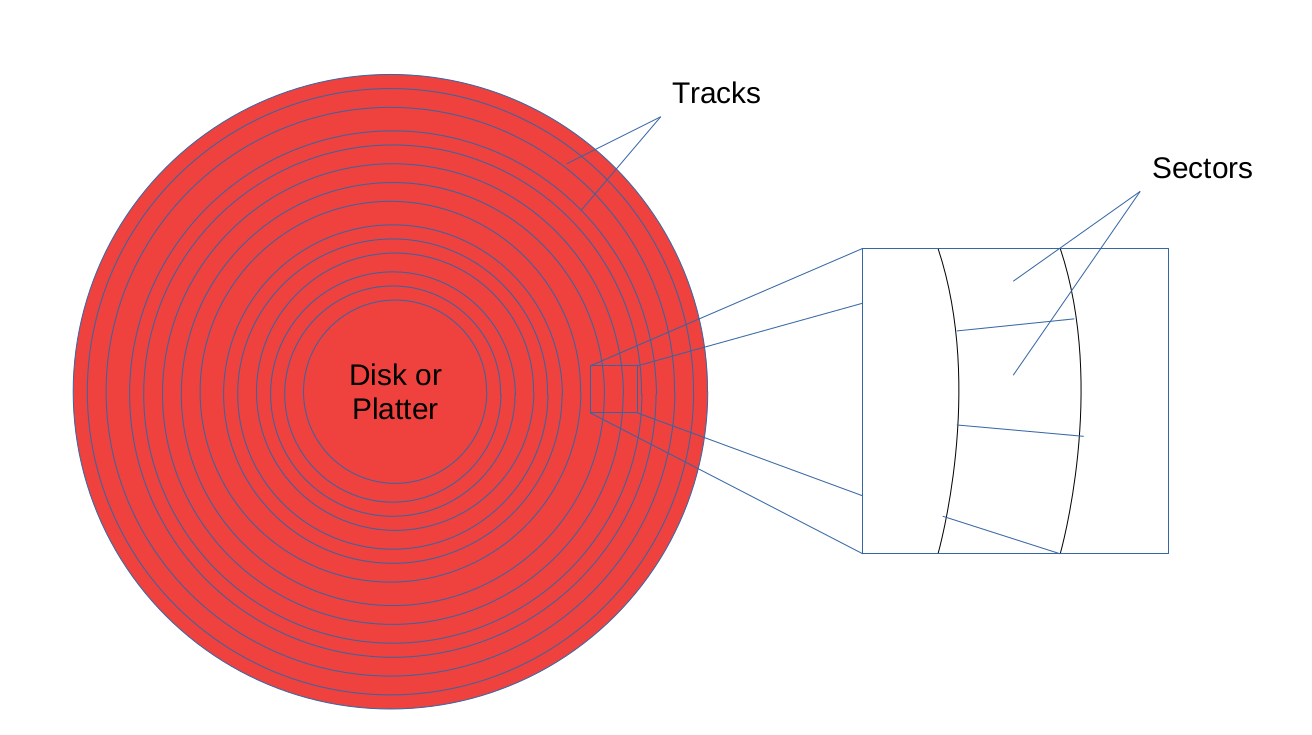
● Decoding a Block Device in Linux

● Role of Block Drivers

● Writing a Block Driver



**The Generic Hard Disk**



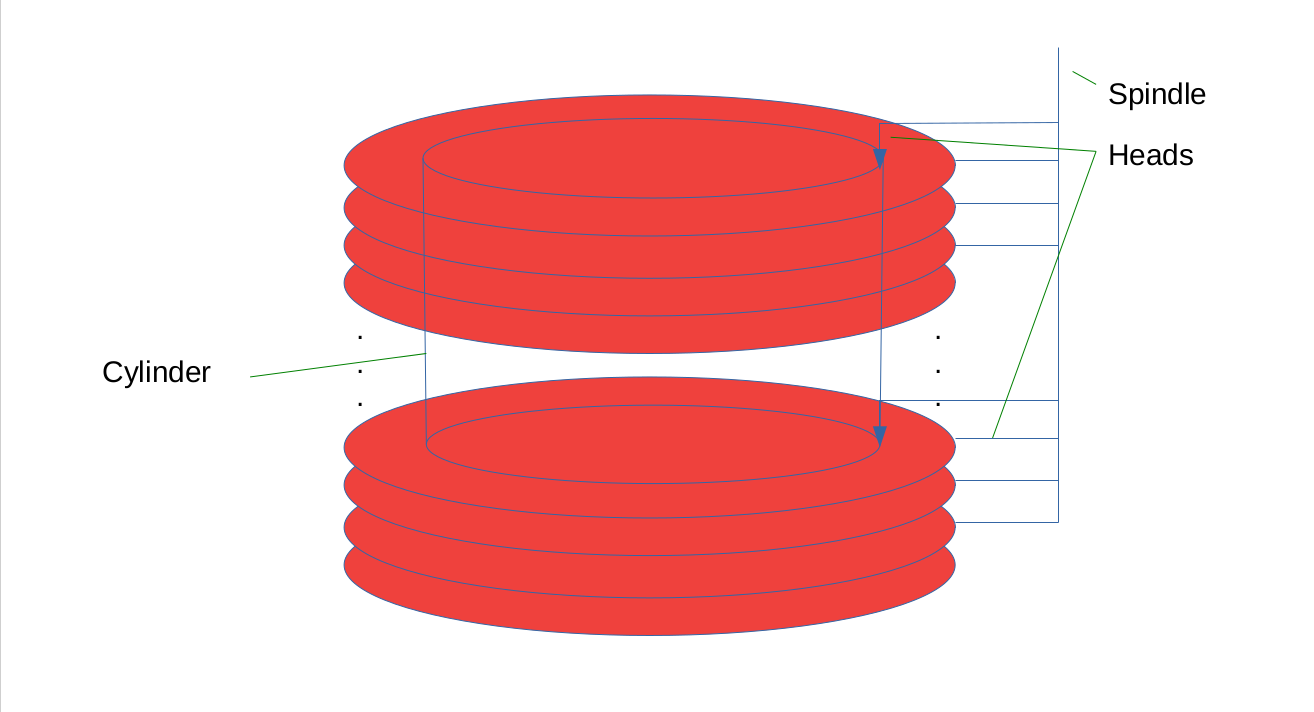
Consenctic rings they are basically track. These circular tracts basically devide into sectors.

Every track having something sectors.

Size of sector -: 512 bytes

You will find upto 63 sectors.

The General Hard Disc



**Computing a Generic Hard Disk**

**● Example (Hard Disk)**

**● Heads (or Platters): 0 – 9**

**● Tracks (or Cylinders): 0 – 24**

**● Sectors: 1 – 64**

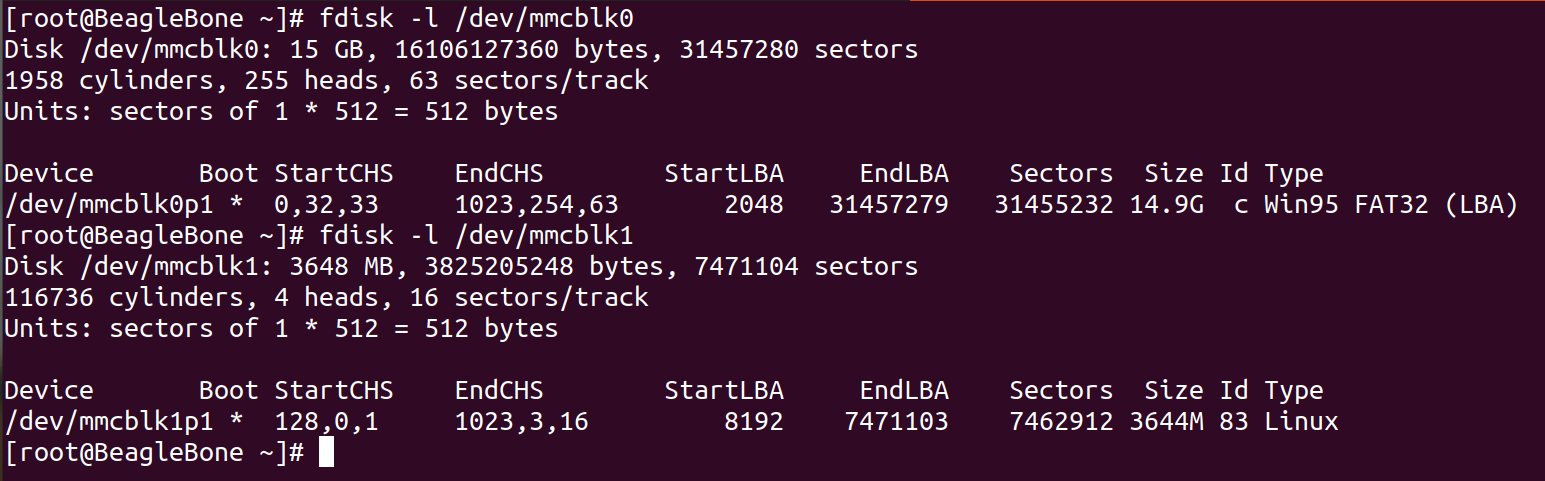
**● Size of the Hard Disk**

**● 10 x 25 x 64 x 512 bytes =81920000 8000KiB**

**● Device independent numbering**

**● (h, t, s) → 64 \* (10 \* t + h) + s → (1 – 16000)**

**How many byte per cylinder?**

****

**1 sector = 512 bytes**

**Number of sector x Size of sector**

**63 x 512**

63 x 512 x 255(disc) = 8225280

Partition & Partion Table

===================

* Divides the hdd into one or more logical disks
* called partitions
* Helpful in organizing different types of data

– Different operating systems data

– User data

– Temporary data

– ...

* Logical division & so need to be maintained by
* metadata – Partition table

Excersise-:

=======

Assignment #01

a. Use dd to create a 1MiB file named disk.

(Hint: You may use /dev/zero or /dev/urandom)

b. Use fdisk to set the heads to 4, sectors to 32, and cylinders to the appropriate number, for disk.

c. Use fdisk to create more than 4 primary partitions, or more than 2 extended partitions.

d. Use fdisk to create the following partitions using the complete disk without gaps:

+ 1 P (FAT32 (LBA)), 1 E, 1 P (Linux)

+ 2 L (Linux swap, Linux)

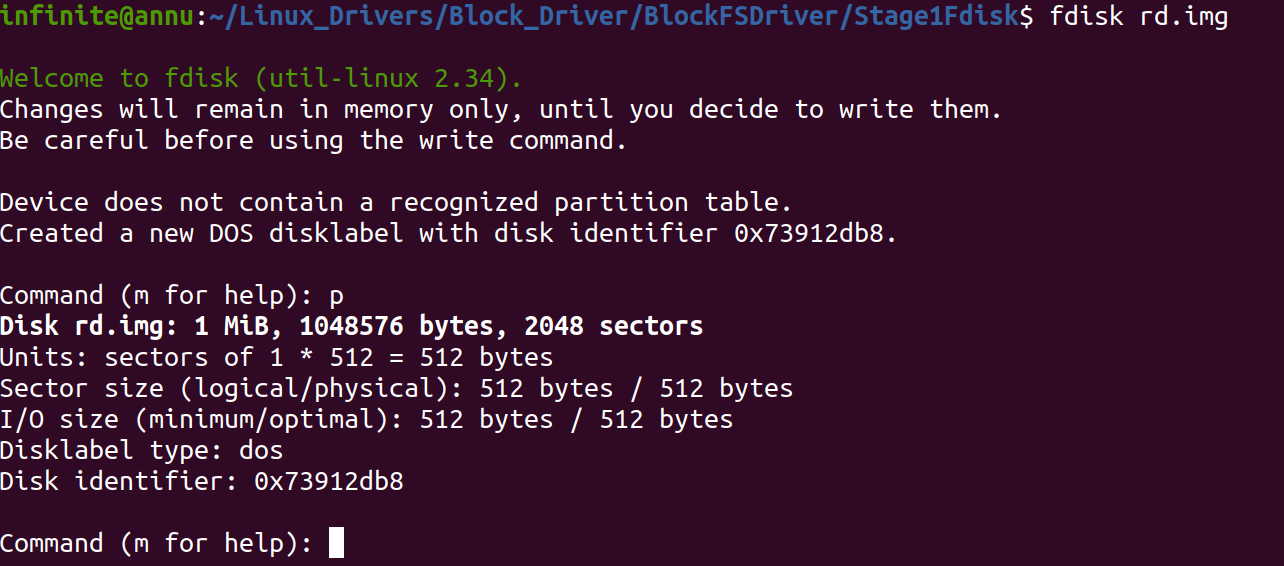
e. Display the disk partitions using p of "fdisk disk" in both sectors & cylinders (unit) display mode (use u).

Heads Up: Avoid using sudo in any of the above experiments, as you really do not need it.

1**. dd if=/dev/zero of=rd.img bs=512 count=2048**

#P|L | L|P

**2. fdisk rd.img**

****

disk\_size = nhds \* secs \* cyl \* size of sector

1Mib = 4 \*32 (512)\* cycl

1Mib = 65536 \* cyc

1024/65536 = cyl

cyl =16

1. Use dd to create a 1MiB file named disk.

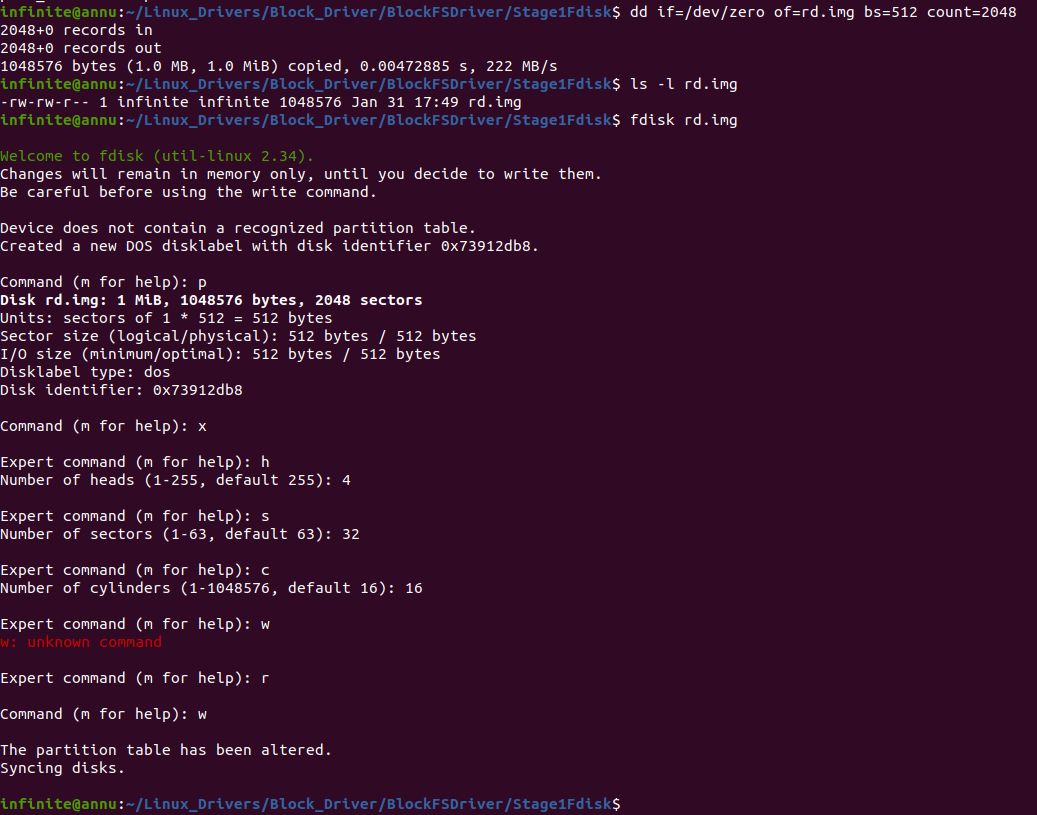
(Hint: You may use /dev/zero or /dev/urandom)

infinite@annu:~/Linux\_Drivers/Block\_Driver/BlockFSDriver/Stage1Fdisk$ **dd if=/dev/zero of=rd.img bs=512 count=2048**

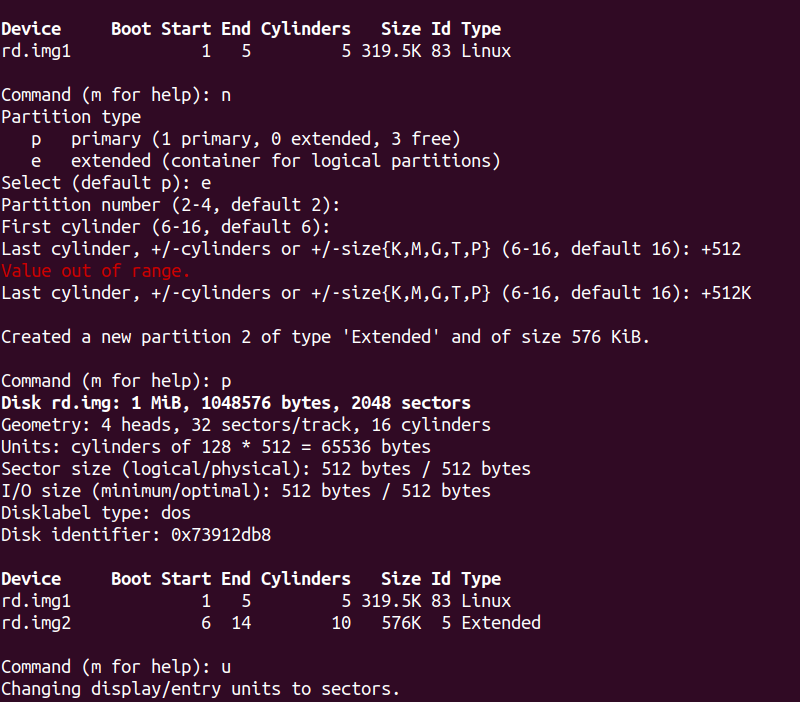
2048+0 records in

2048+0 records out

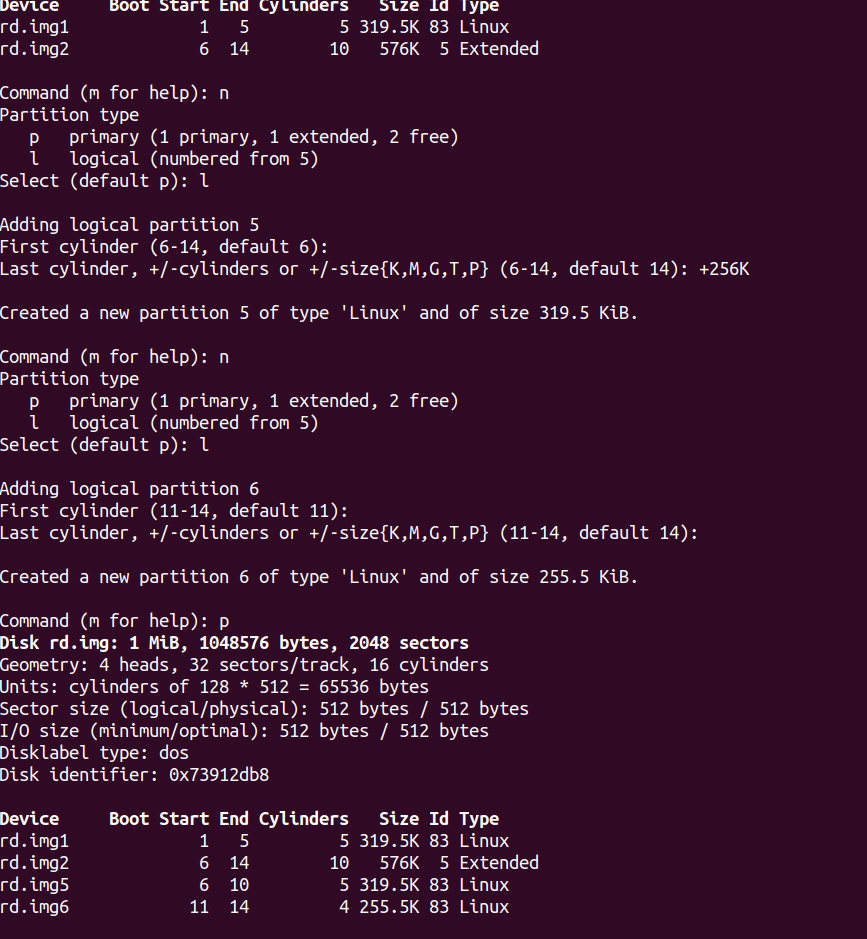
1048576 bytes (1.0 MB, 1.0 MiB) copied, 0.00472885 s, 222 MB/s

****

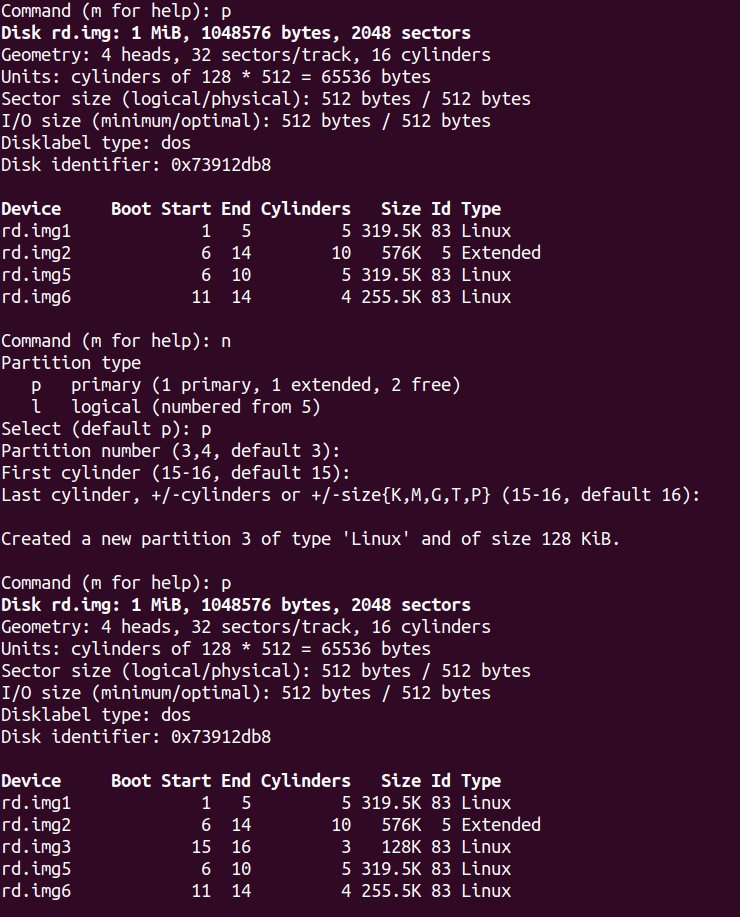
**Create 2nd Partition Extended**

****

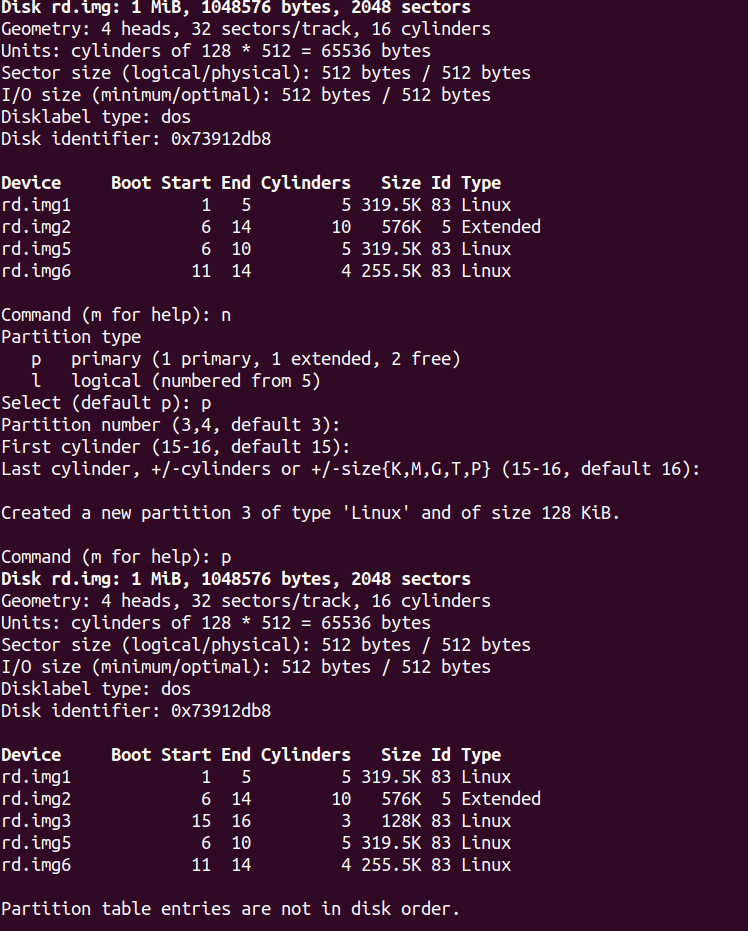
**3. Logical Partition (2 Logical Partition)**

****

**4. Now Primary Partiotion**

****

**Last Primary Partition -: w for save and sync**

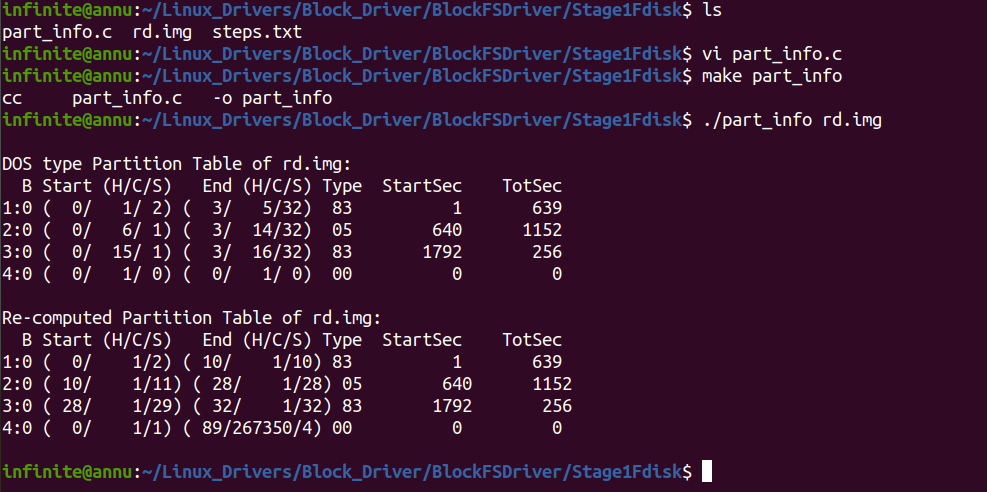
****

How to check h,s,c wise like Linux?

Ans -:

make part\_info

**./part\_info rd.img**

****

we need to creat device file to support like

we dont have here seprate for rd.img

ls /*dev /* rd.img1

ls /*dev /* rd.img2

ls /*dev /* rd.img3

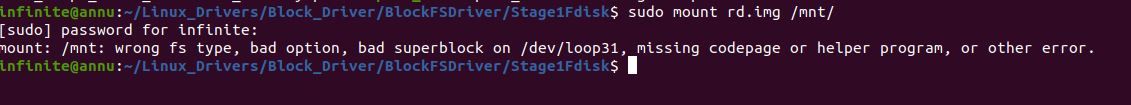
ls /*dev /* rd.img4

fdisk able to read rd.img

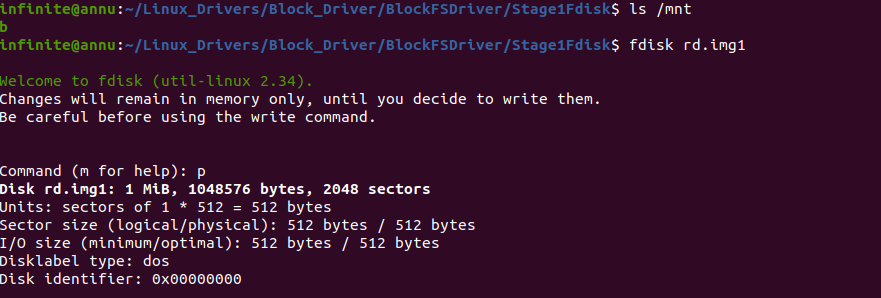
Not easy to creat file system. Like to store file in that partition we not able to mount.

fdisk is able to read it but filesystem not able to use it

We wants to use a driver so that this driver can show saperate device file to us so we are able to mount and use it .



Why my partition gone?



Check file History

**0002\_Steps\_Why\_Partition\_Gone\_After\_fdisk.patch**

Partition read it fdisk but when I do mkfs i wants something like rd1.img.

So i need saperate file so i can create file syatem. The moment i created

We need basically rd1.img , rd2.img like that. On which i creat file syatem. But it was only one partition

File system create data structure data structure and inode table and all info.

Whne i do mkfs so it lost mbr and data structure.

**So mkfs overwrote evrything.**

**Need -:**

**support for block driver which create one saperate create device file on which i can create file system. So with the help of that we can store the data into partition. Thats why Block IO layer comes into picture.**

**How we can creat rmdisk ;**

perticular portion of RAM will creat as disk. We will operate on it. And block driver we called block driver of ramdisk.

**# 1Mib (disk) – Ramdisk Block Driver**

**Excersise -: End Goal**

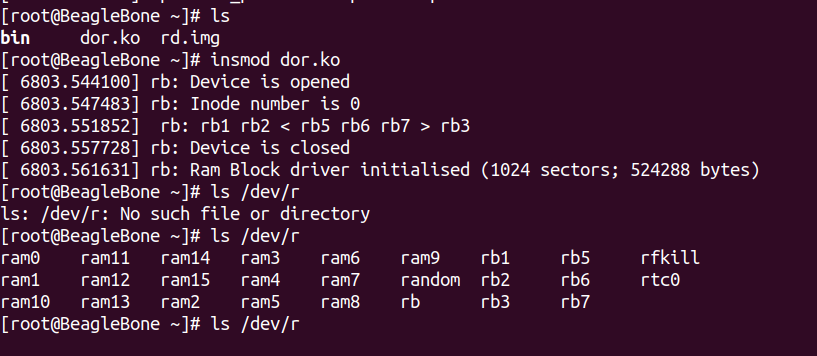
**===============**

**Block\_Driver/BlockFSDriver/Stage1Fdisk**

file – dor.ko

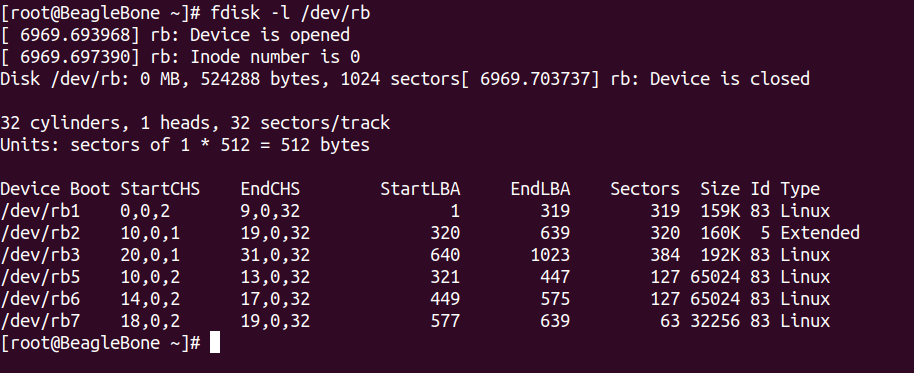
file -: rd.img

Transfer into board

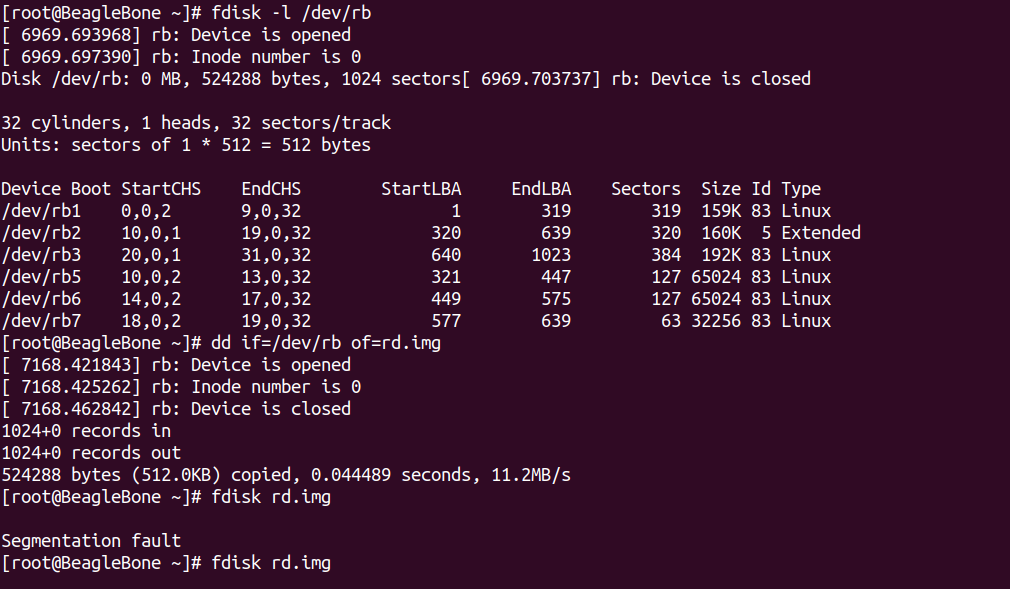


We wants to achieve this type of driver at the end.

Partttion on board -:

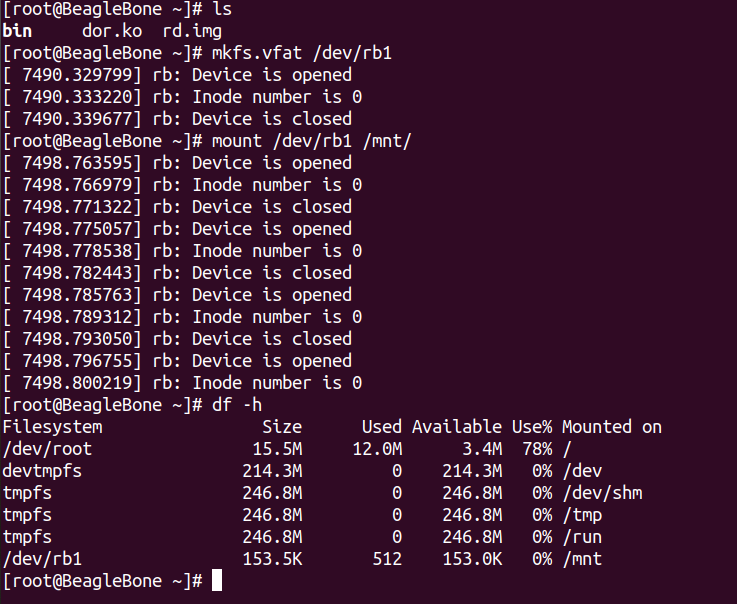


**320** its end but why its starting from 321 -: store LBR

****

**mkfs.vfat /*dev/*rb1**

**mount /*dev/*rb1 /dev**

****