BOOT FROM SD CARD

https://www.forecr.io/blogs/bsp-development/change-root-file-system-to-sd-card-directly

How to format the SD card as ext4

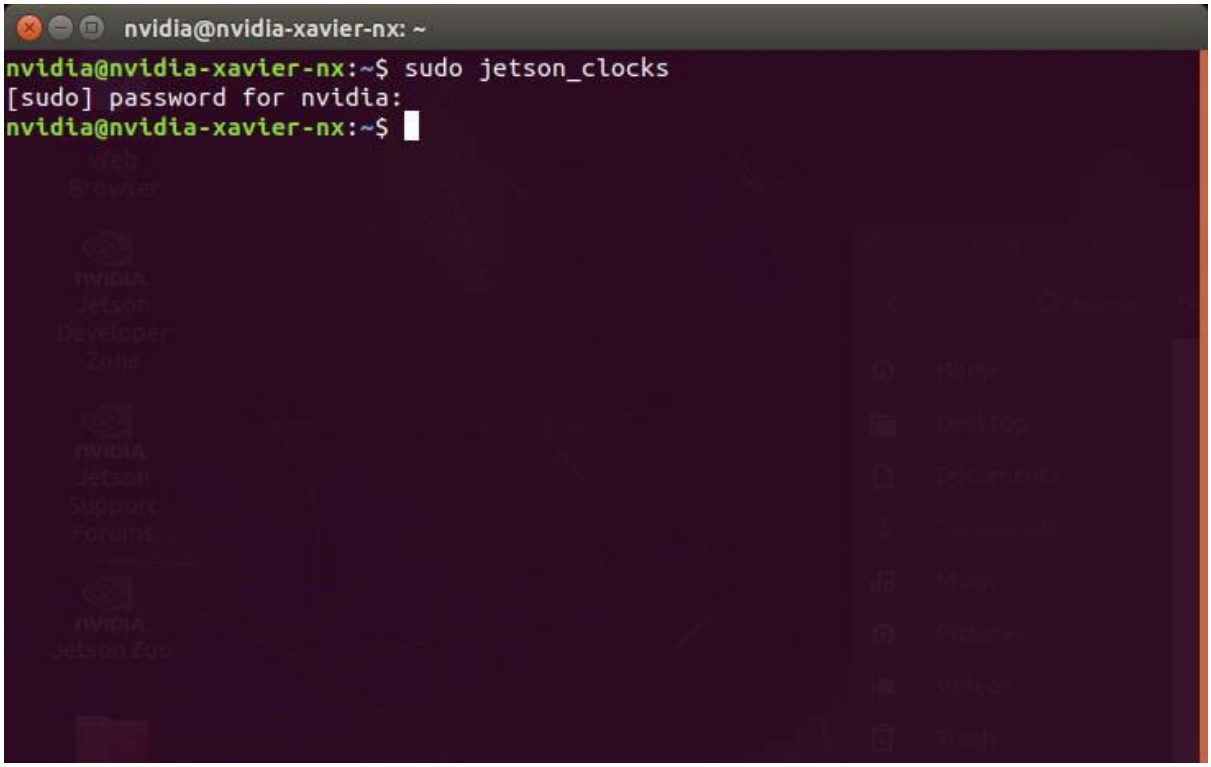
In this blog post, we will explain how to move your root file system on EMMC flash to SD card storage directly. The previous version of this post is here: https://www.forecr.io/blogs/bsp-development/changing-storage-of-the-root-file-system-emmc-to-sdmmc

The advantage of this version is the boot up speed. In the previous version, the file system into the SD card mounted with a service after the file system into the eMMC mounted. This process increases the boot up time. In this post, the file system into the SD card mounted directly without any service. On the other hand, the Jetson module won't boot up without SD card until the extlinux.conf file changed. To avoid this problem, you can backup your Jetson module before changing the root file system.

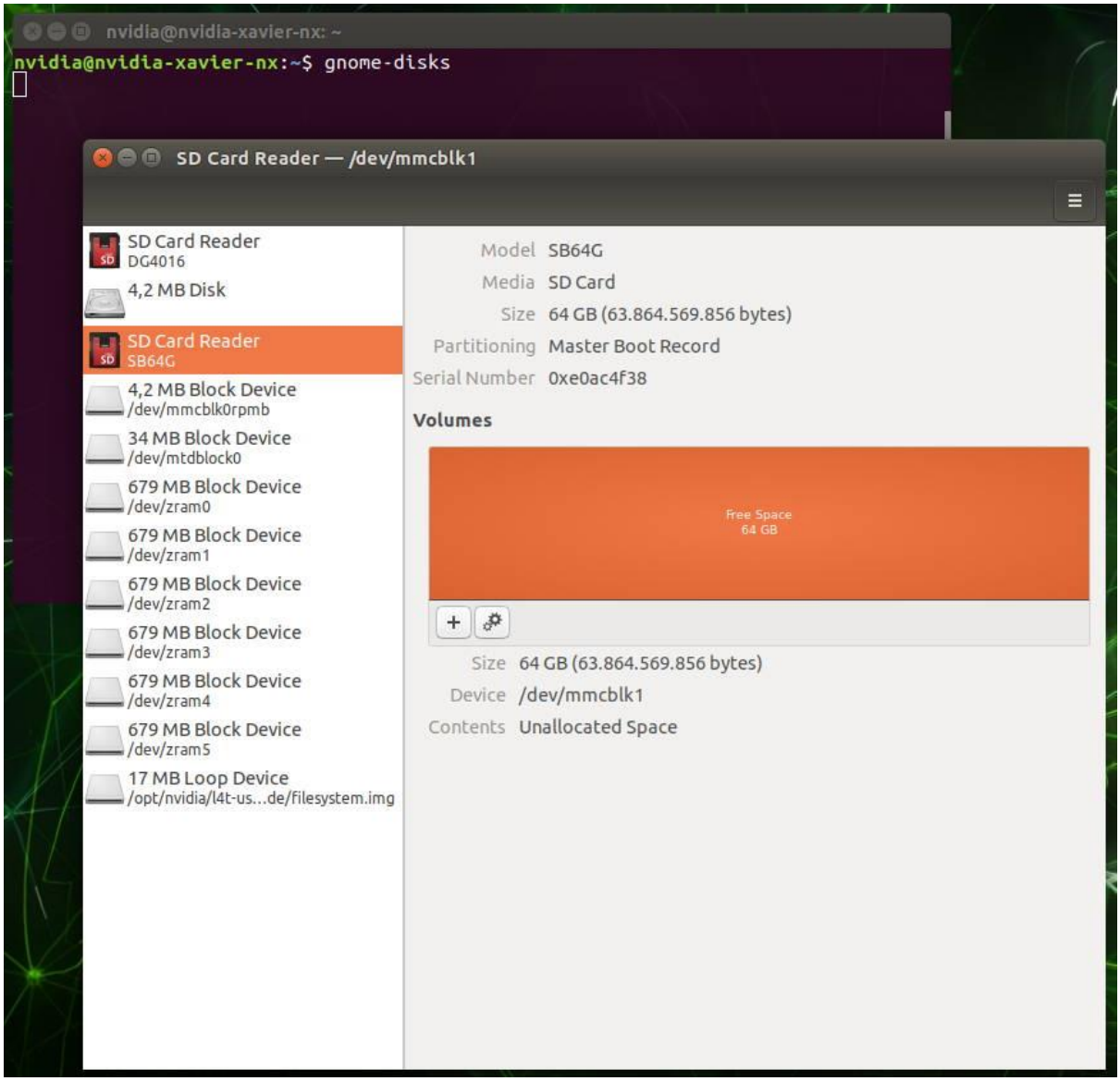
First, connect your SD card to SD card slot and connect the basic interfaces (Ethernet, HDMI, keyboard, mouse) then power on.

Open a terminal and type these commands below:

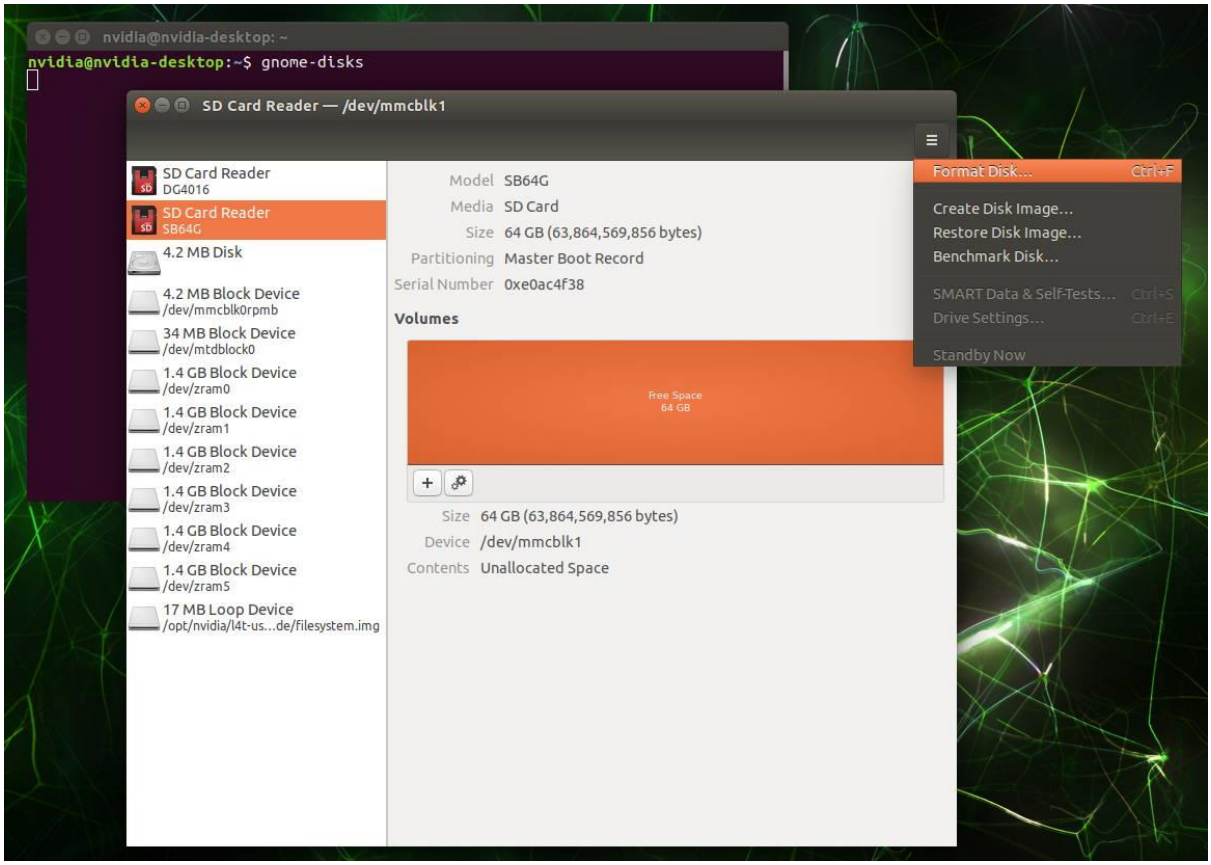
```
sudo jetson_clocks
gnome-disks
```

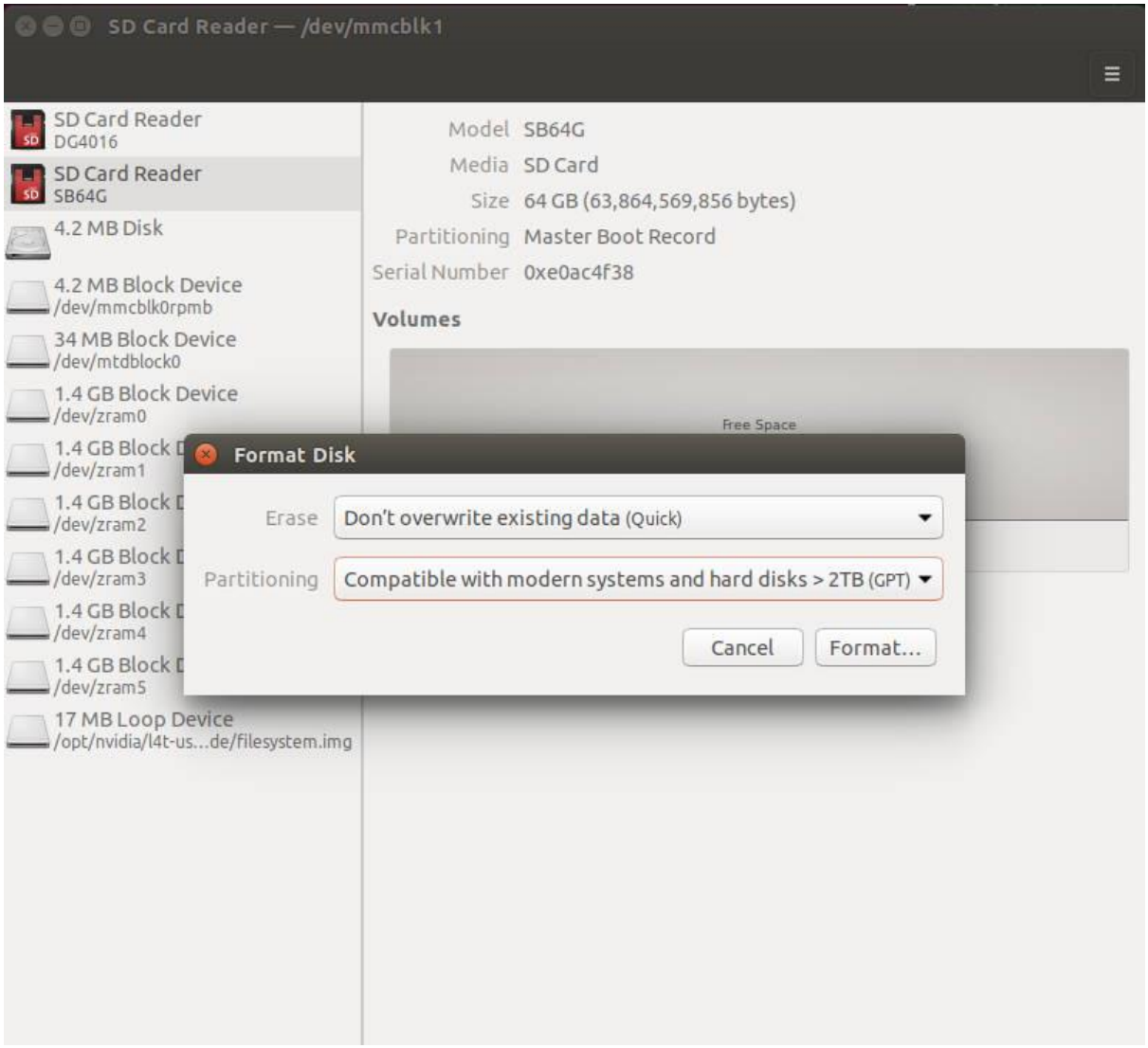


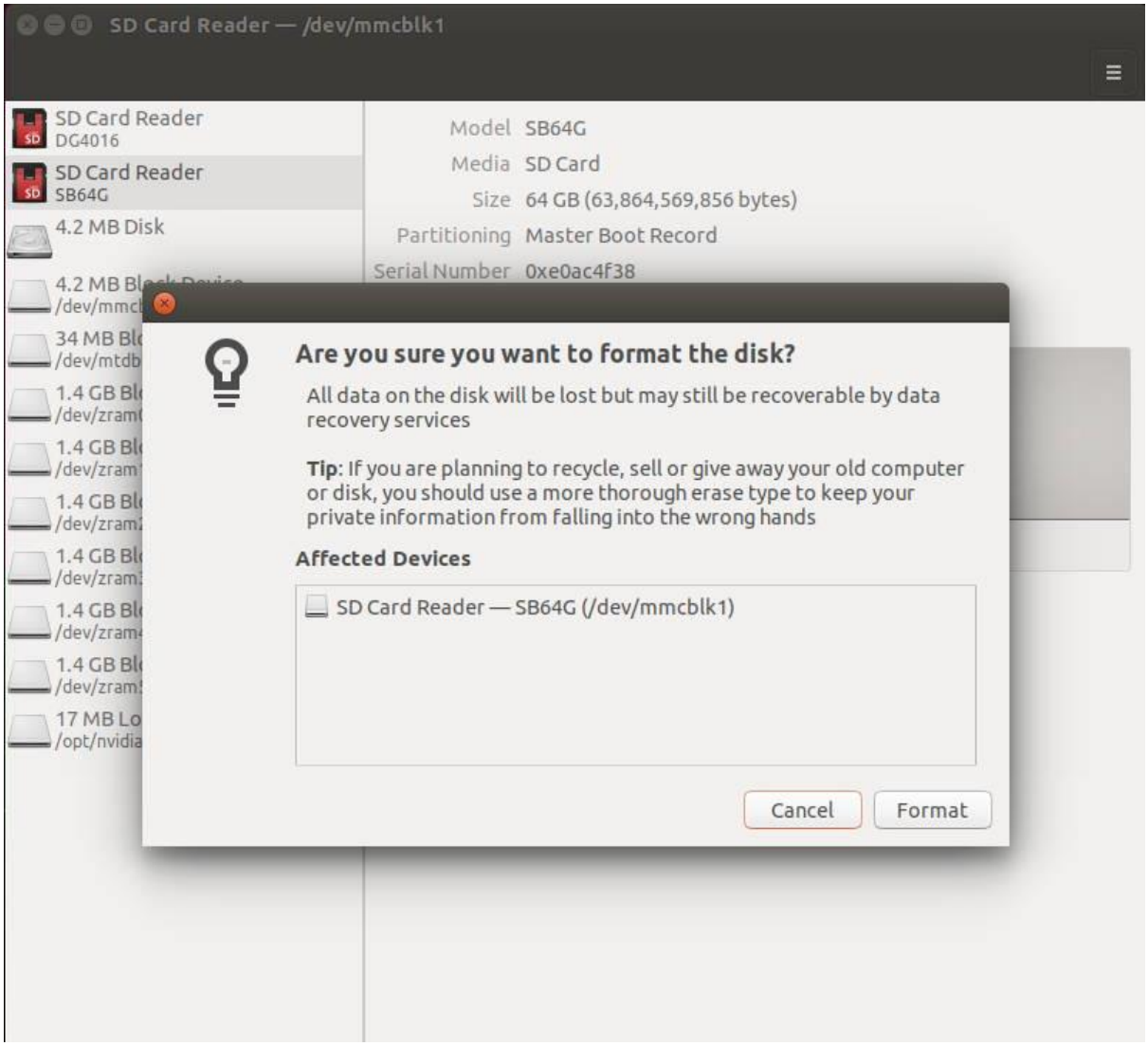
The first command allows the Jetson module's whole sources to use. The next command opens GNOME Disks application below.



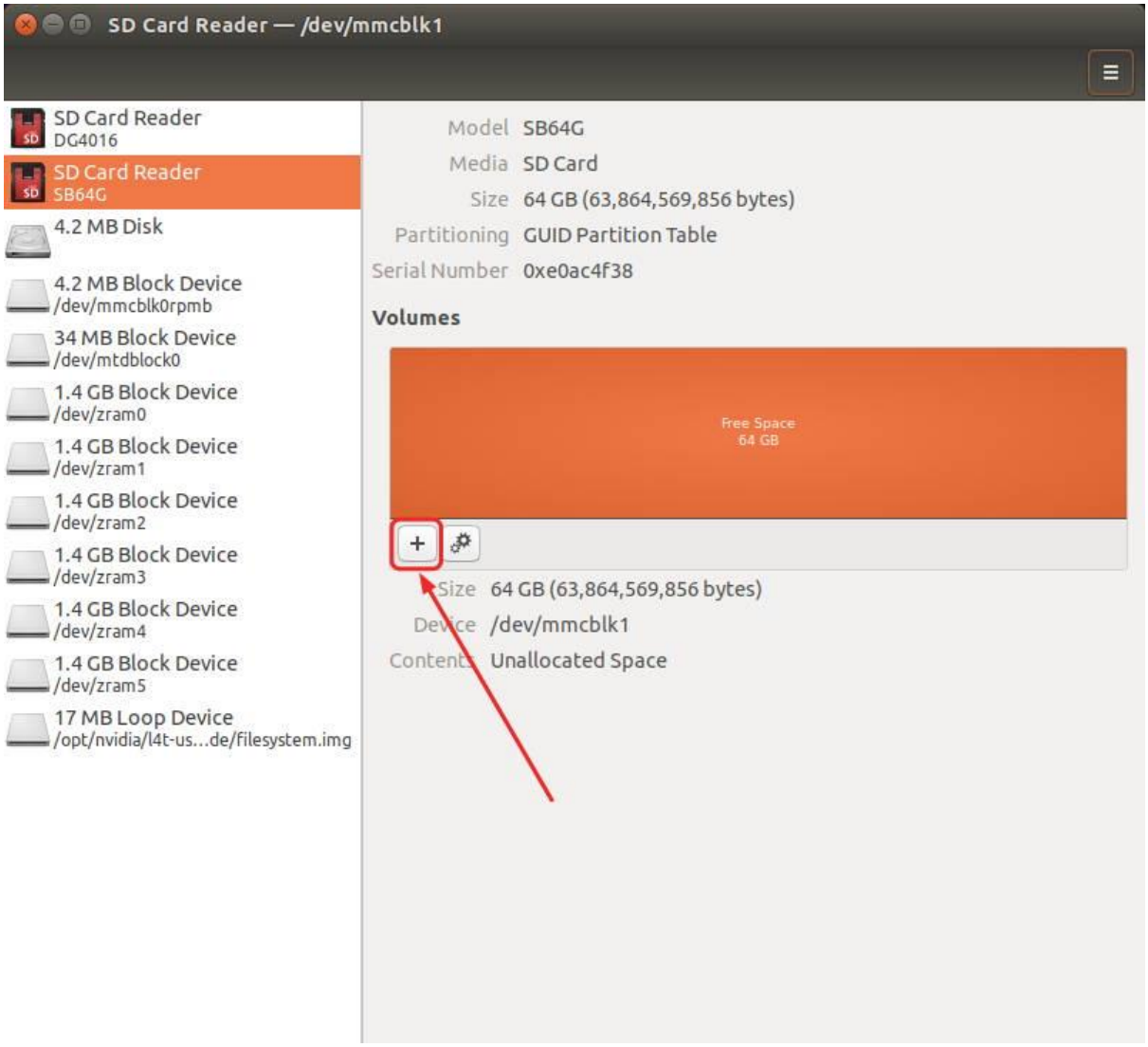
Format the whole disk before creating the storage.


nvidia@nvidia-desktop: ~
nvidia@nvidia-desktop:~$ gnome-disks
SD Card Reader — /dev/mmcblk1
SD Card Reader
DG4016
SD Card Reader
SB64G
4.2 MB Disk
4.2 MB Block Device
/dev/mmcblk0rpmb
34 MB Block Device
/dev/mtdblock0
1.4 GB Block Device
/dev/zram0
1.4 GB Block Device
/dev/zram1
1.4 GB Block Device
/dev/zram2
1.4 GB Block Device
/dev/zram3
1.4 GB Block Device
/dev/zram4
1.4 GB Block Device
/dev/zram5
17 MB Loop Device
/opt/nvidia/l4t-us...de/filesystem.img
Model SB64G
Media SD Card
Size 64 GB (63,864,569,856 bytes)
Partitioning Master Boot Record
Serial Number 0xe0ac4f38
Volumes
Free Space
64 GB
Size 64 GB (63,864,569,856 bytes)
Device /dev/mmcblk1
Contents Unallocated Space
Format Disk... Ctrl+F
Create Disk Image...
Restore Disk Image...
Benchmark Disk...
SMART Data & Self-Tests... Ctrl+S
Drive Settings... Ctrl+E
Standby Now


SD Card Reader — /dev/mmcblk1
SD Card Reader
DG4016
SD Card Reader
SB64G
4.2 MB Disk
4.2 MB Block Device
/dev/mmcblk0rpmb
34 MB Block Device
/dev/mtdblock0
1.4 GB Block Device
/dev/zram0
1.4 GB Block D
/dev/zram1
1.4 GB Block D
/dev/zram2
1.4 GB Block D
/dev/zram3
1.4 GB Block D
/dev/zram4
1.4 GB Block D
/dev/zram5
17 MB Loop Device
/opt/nvidia/l4t-us...de/filesystem.img
Model SB64G
Media SD Card
Size 64 GB (63,864,569,856 bytes)
Partitioning Master Boot Record
Serial Number 0xe0ac4f38
Volumes
Free Space
Format Disk
Erase
Don't overwrite existing data (Quick)
Partitioning
Compatible with modern systems and hard disks > 2TB (GPT)
Cancel
Format...



Then, create a new partition from SD card storage.


SD Card Reader — /dev/mmcblk1
SD Card Reader
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4.2 MB Disk
4.2 MB Block Device
/dev/mmcblk0rpmb
34 MB Block Device
/dev/mtdblock0
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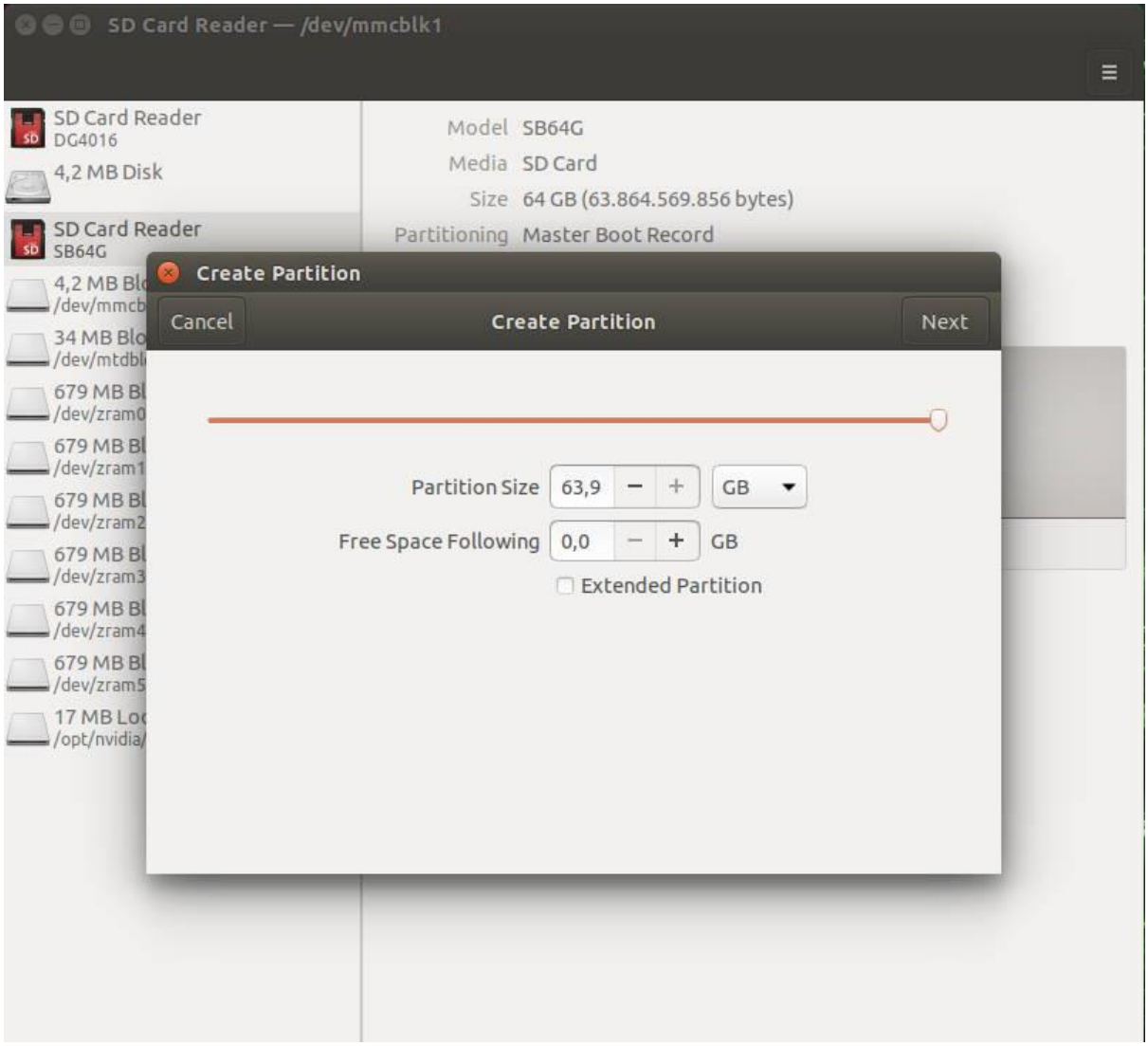
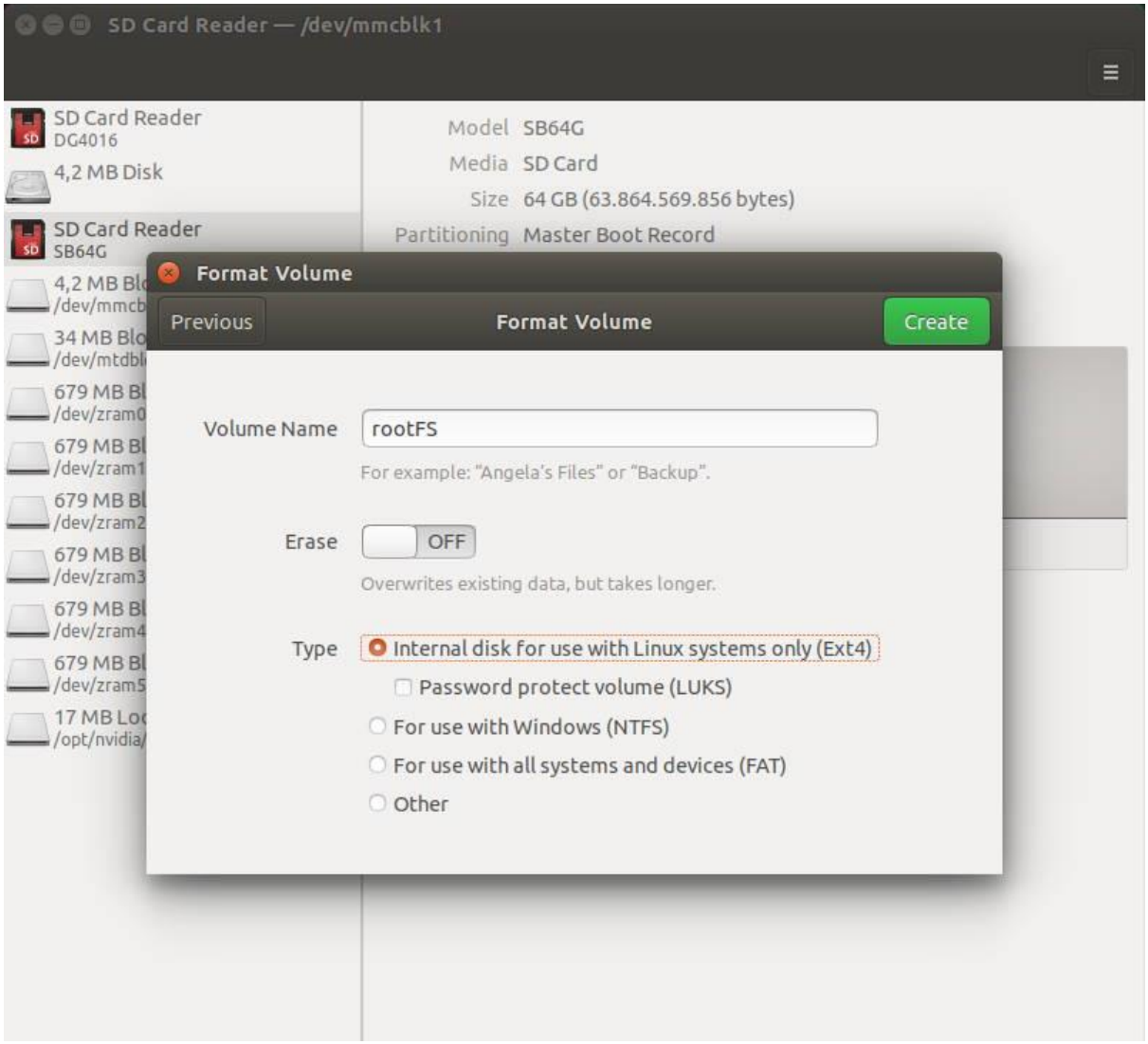
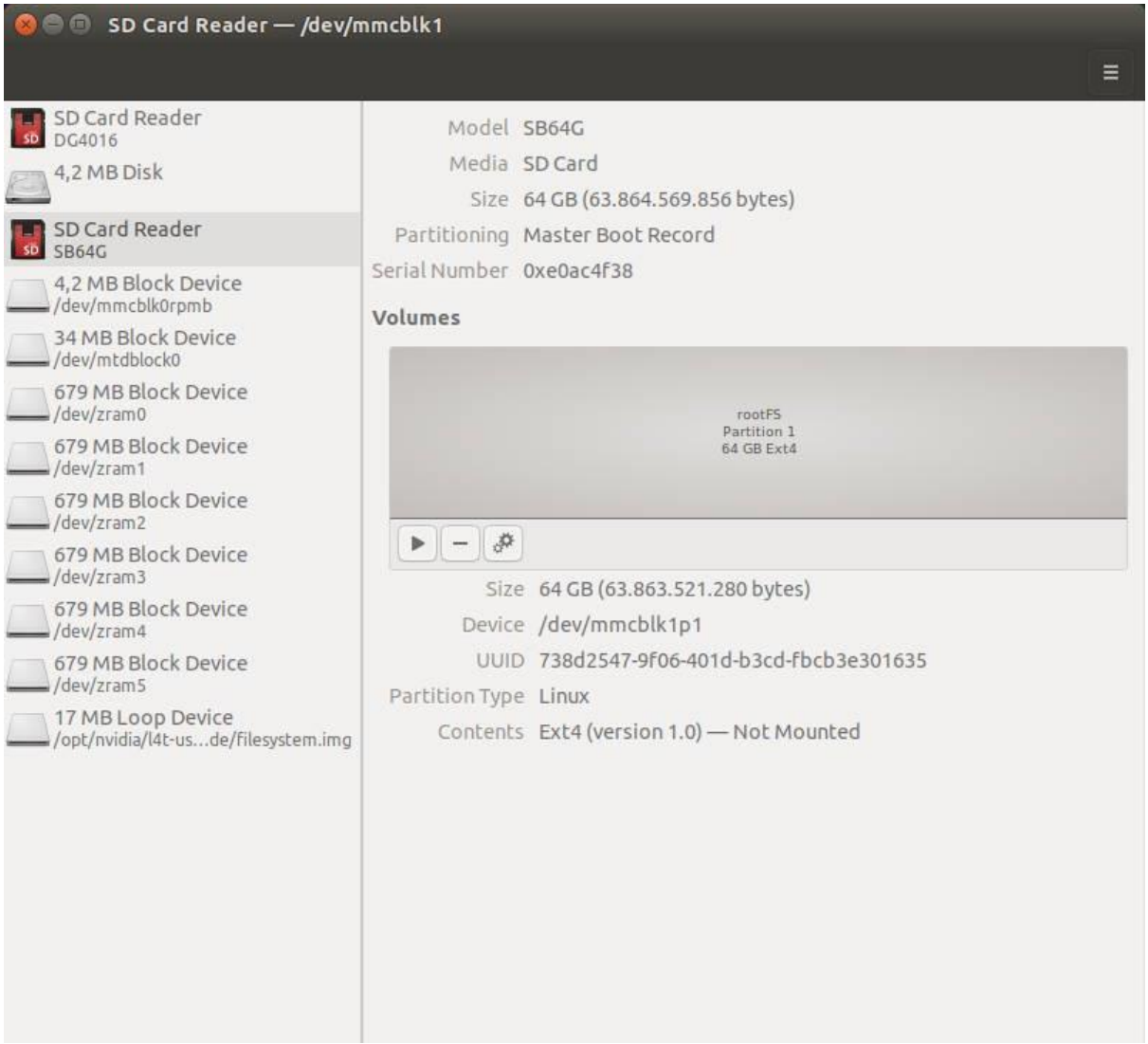
/dev/zram1
1.4 GB Block Device
/dev/zram2
1.4 GB Block Device
/dev/zram3
1.4 GB Block Device
/dev/zram4
1.4 GB Block Device
/dev/zram5
17 MB Loop Device
/opt/nvidia/l4t-us...de/filesystem.img
Model SB64G
Media SD Card
Size 64 GB (63,864,569,856 bytes)
Partitioning GUID Partition Table
Serial Number 0xe0ac4f38
Volumes
Free Space
64 GB
Size 64 GB (63,864,569,856 bytes)
Device /dev/mmcblk1
Contents Unallocated Space



Format the disk as ext4 format (partition size is up to you but must be min current file system's size).



After creating the partition, check it's name (/dev/mmcblk1p1).



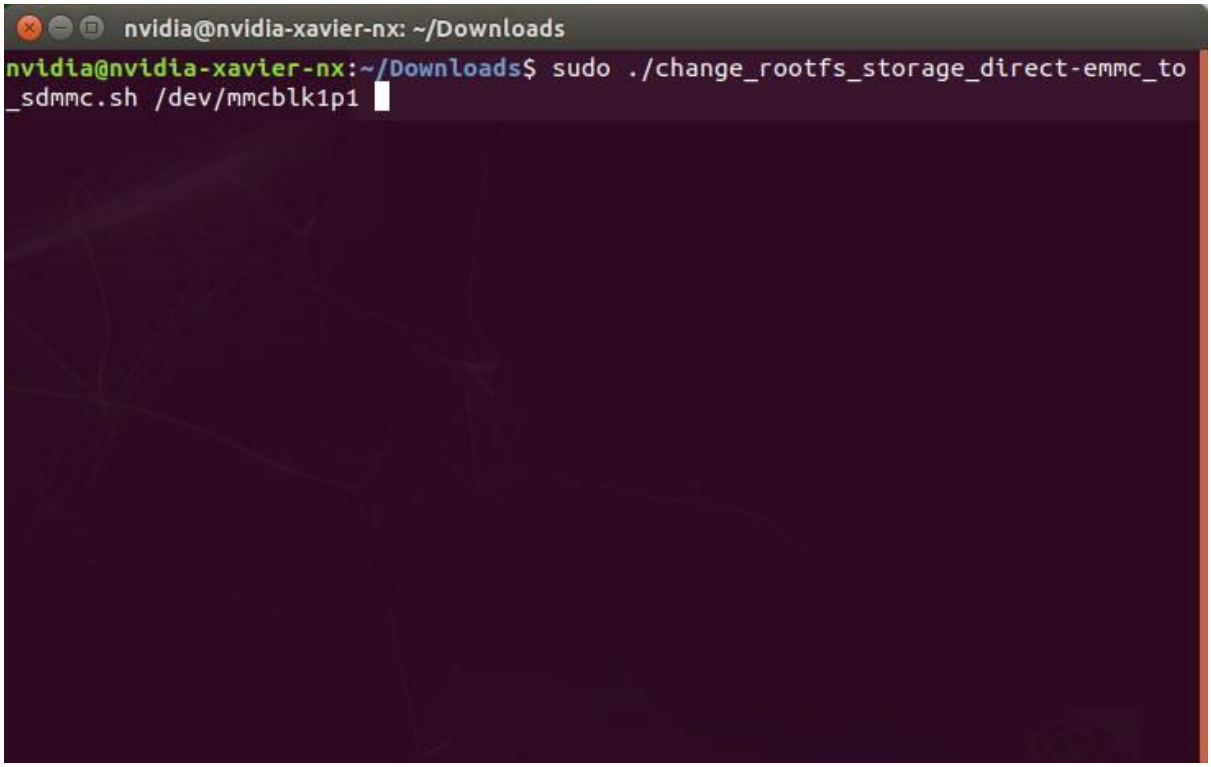
How to copy the root file system?

Download the script file from **here** and extract it. Then, run it with this command below:

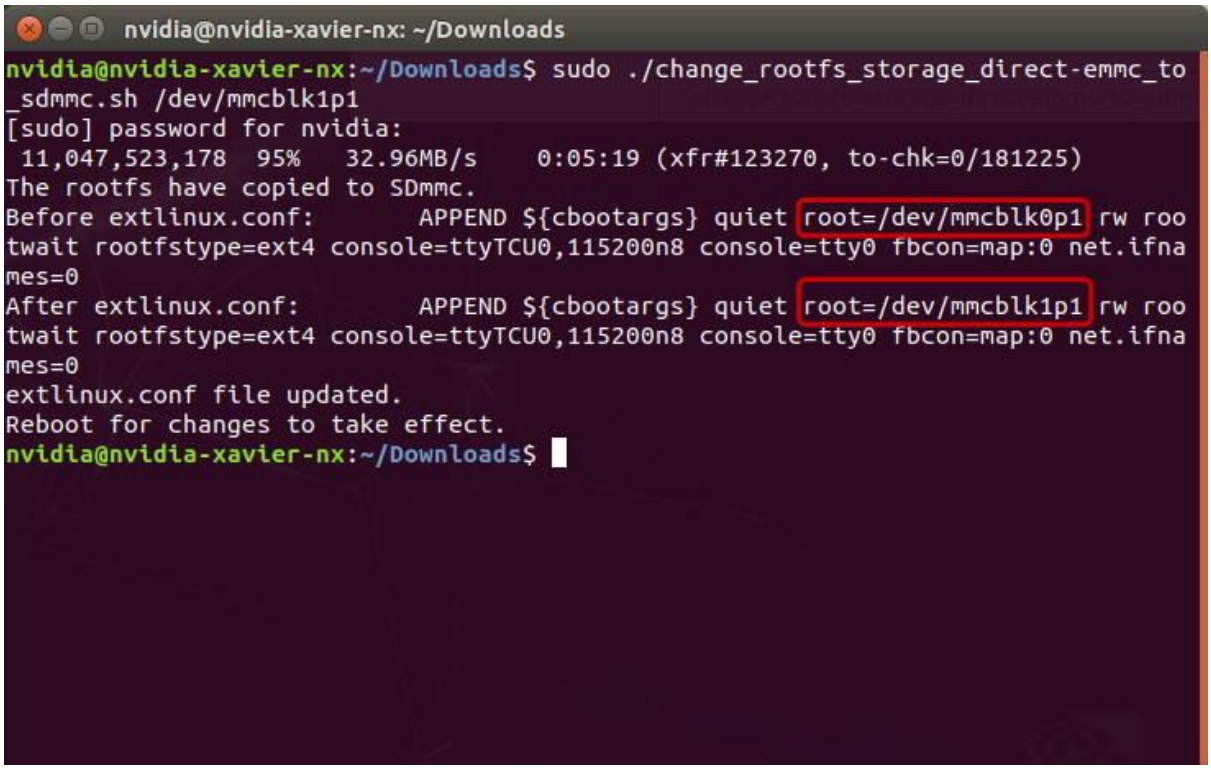
```
sudo ./change_rootfs_storage_direct-emmc_to_sdmmc.sh {EXTERNAL_STORAGE}
```

In our setup, we typed this command below:

```
sudo ./change_rootfs_storage_direct-emmc_to_sdmmc.sh /dev/mmcblk1p1
```



A few times later, the whole file system copied and the root path changed.

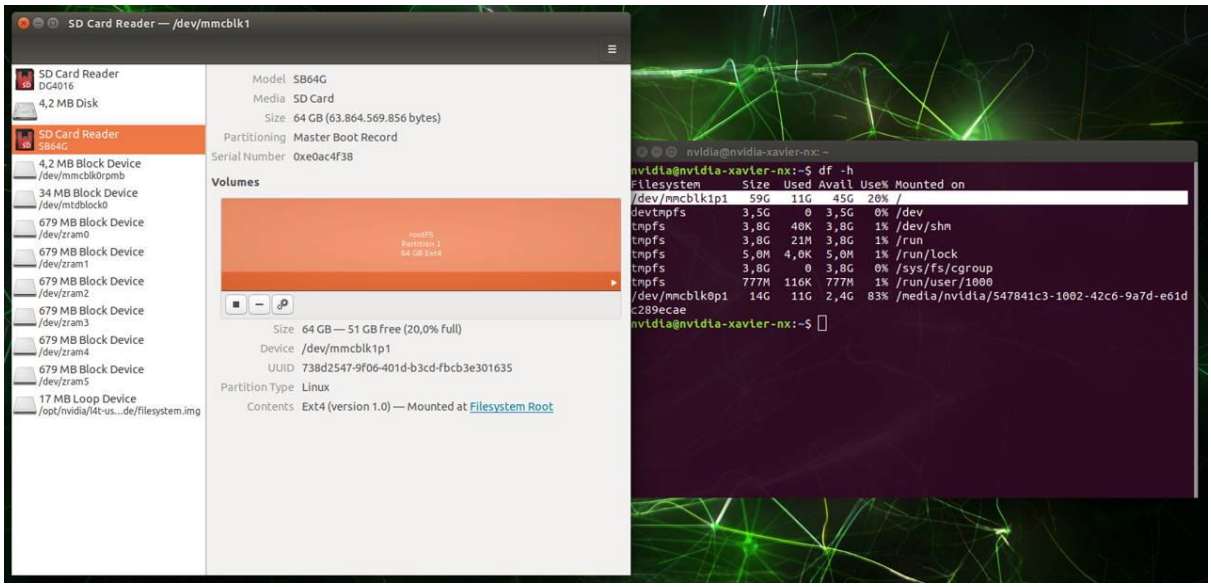


It’s time to reboot the Jetson module. Reboot it and check the Root File System copied successfully.

How to assign SD card as root file system?

Open a terminal and type this command to check the root mounted from SD card below:

```
df -h
```



After rebooting you can see that the new storage is assigned as root file system.