

# Raspberrypi Memory partition in dunfell

For a raspberrypi image, mainly there are two partitions, kernel and rootfs. The size of kernel size is ~48M. Rootfs is mounted on SD card and its value can be increased using gparted,fdisk or similar tool. By default while flashing an image to SD card, two partitions are created, namely mmcblk0p1 and mmcblk0p2. rootfs image is stored in mmcblk0p2 whereas mmcblk0p1 holds boot information.

The details of sd card partitions and its sizes can be found using "fdisk -l command"

```
root@raspberrypi-rdk-hybrid:~# fdisk -l
Disk /dev/mmcblk0: 14 GB, 15552479232 bytes, 30375936 sectors
474624 cylinders, 4 heads, 16 sectors/track
Units: sectors of 1 * 512 = 512 bytes

Device            Boot StartCHS   EndCHS   StartLBA   EndLBA   Sectors   Size   Id Type
/dev/mmcblk0p1 *    64,0,1     841,0,32   8192      107679   99488     48.5M  c Win95 FAT32 (LBA)
/dev/mmcblk0p2      896,0,1    1023,3,32  114688    10711039 10596352  5174M  83 Linux
root@raspberrypi-rdk-hybrid:~#
```

For changing sd card partition using gparted refer below link.

[Partitioning and Resizing using GParted GUI](#)

## Memory Usage

The memory in raspberrypi is partitioned into different sessions and the details of these partitions and allocated size for these partitions can be found out using df command. df -h command gives size allocated to each of these partitions and the size that is already used by different components.

```
root@raspberrypi-rdk-hybrid:~# df -h
Filesystem      Size  Used  Available Use%  Mounted on
/dev/root        865.5M 552.0M 252.0M   69%  /
devtmpfs         339.6M  0      339.6M   0%  /dev
tmpfs            468.1M  8.0K   468.1M   0%  /dev/shm
tmpfs            194.3M  8.8M   185.6M   5%  /run
tmpfs            468.1M  0       468.1M   0%  /sys/fs/cgroup
tmpfs            468.1M  6.6M   461.5M   1%  /tmp
tmpfs            468.1M  6.6M   461.5M   1%  /etc/snmp/snmpd.conf
tmpfs            468.1M 236.0K 467.9M   0%  /var/volatile
/dev/root        865.5M 552.0M 252.0M   69%  /var/lib
/dev/mmcblk0p1   48.5M 27.4M  21.0M   57%  /boot
tmpfs            93.6M  0       93.6M   0%  /run/user/0
root@raspberrypi-rdk-hybrid
```

The total amount of RAM memory used and the available memory can be found using free command. free -lh command gives the details of the amount of memory used out of the total memory and the available memory that can be used for functions like audio/video playback.

```
root@raspberrypi-rdk-hybrid:~# free -lh
              total        used        free      shared  buff/cache   available
Mem:          936M        571M        217M         26M         147M        311M
Low:          936M        718M        217M
High:           0B           0B           0B
Swap:          0B           0B           0B
root@raspberrypi-rdk-hybrid:~#
```

## Boot memory Information

The memory allocated for each component at the time of boot up is given below.

| Component   | Size  |
|-------------|-------|
| Kernel code | 9216K |
| RW data     | 737K  |
| RO data     | 2928K |
| init        | 1024K |
| BSS         | 853K  |

|             |          |
|-------------|----------|
| vmalloc     | 1097K    |
| cma total   | 262K     |
| KernelStack | 2536 kB  |
| Shmem       | 14596 kB |

#### Graphics memory

Graphics memory, commonly called GPU memory is the amount of memory available on graphics card and is used by graphics processor. We can use `vcgencmd` for getting gpu memory information.

Please refer below link for GPU memory details.

[GPU Memory Consumption Analysis](#)

```
root@raspberrypi-rdk-hybrid:~# vcgencmd get_mem gpu
gpu=64M
```

#### Changing tmpfs partition size

Size of tmpfs partition can be changed by using `fstab`. Below are the list of tmpfs partitions.

```
tmpfs      468.1M  4.0K  468.1M  0% /dev/shm
tmpfs      194.3M  8.8M  185.5M  5% /run
tmpfs      468.1M   0    468.1M  0% /sys/fs/cgroup
tmpfs      468.1M  2.2M  466.0M  0% /tmp
tmpfs      468.1M  2.2M  466.0M  0% /etc/snmp/snmpd.conf
tmpfs      468.1M 320.0K 467.8M  0% /var/volatile
```

The size of these partitions can be changed by mentioning size in `/etc/fstab`. For example, we reduce size of `/run` to ~100M by mentioning size as below. Reboot the device after `fstab` is modified.

```
root@raspberrypi-rdk-hybrid:~# vi /etc/fstab
# stock fstab - you probably want to override this with a machine specific one

/dev/root      /           auto      defaults    1 0
proc           /proc       proc      defaults    0 0
devpts         /dev/pts    devpts    mode=0620,ptmxmode=0666,gid=5  0 0
tmpfs          /run        tmpfs     mode=0755,nodev,nosuid,strictatime,size=103741824 0 0
tmpfs          /var/volatile tmpfs     defaults    0 0

# uncomment this if your device has a SD/MMC/Transflash slot
#/dev/mmcblk0p1 /media/card auto      defaults,sync,noauto 0 0

/dev/mmcblk0p1 /boot       vfat      defaults    0 0
```

The changed size can be verified using `df` command. The above change results in

```
root@raspberrypi-rdk-hybrid:~# df -h
Filesystem      Size  Used  Available Use%  Mounted on
/dev/root        865.5M 557.0M 247.0M   69%  /
devtmpfs         339.6M   0    339.6M   0%  /dev
tmpfs            468.1M  8.0K  468.1M   0%  /dev/shm
tmpfs            98.9M  8.8M  90.2M    9%  /run
tmpfs            468.1M   0    468.1M   0%  /sys/fs/cgroup
tmpfs            468.1M  6.6M  461.5M   1%  /tmp
tmpfs            468.1M  6.6M  461.5M   1%  /etc/snmp/snmpd.conf
tmpfs            468.1M 428.0K 467.7M   0%  /var/volatile
/dev/root        865.5M 557.0M 247.0M   69%  /var/lib
/dev/mmcblk0p1   48.5M  27.4M  21.0M   57%  /boot
tmpfs            93.6M   0    93.6M   0%  /run/user/0
```