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 partions and its sizes can be found using "fdsik -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.

[Partioning 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.

```
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
```