SD Card Partitioning & Formating

Every storage device having one or more logical partitionings and default mount points. The partition contains information about disk partitions.when your conneting device the partitions will show in /dev like /dev/sda,sdb.....etc.This informations is available through linux disk partitioning command fdisk.

Disk partitioning

In linux so many tools available for disk partitioning . The widely using tool is fdisk. The following steps will give information about disk partition.

- Connect your sd card to system then use fdisk -l command to get the information about the sd card.
- This command will show all disks connected to system information.

```
root@veda:/home/documents# fdisk -l

Disk /dev/sda: 500.1 GB, 500107862016 bytes
255 heads, 63 sectors/track, 60801 cylinders, total 976773168 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disk identifier: 0x0004f5d6

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048   968718335   484358144   83  Linux
/dev/sda2       968720382   976771071     4025345    5  Extended
Partition 2 does not start on physical sector boundary.
/dev/sda5       968720384   976771071     4025344   82  Linux swap / Solaris

Disk /dev/sdb: 7948 MB, 7948206080 bytes
245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0004c942

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1   *        2048     1050623      524288    b  W95 FAT32
/dev/sdb2         1050624    15523839     7236608   83  Linux
root@veda:/home/documents#
```

- Here my device represets with sdb and my device having two active partitions named as

sdb1 and sdb2.

- Now use fdisk /dev/sdb this will give one menu

```
root@veda:/home/documents# fdisk /dev/sdb

Command (m for help): m
Command action
   a   toggle a bootable flag
   b   edit bsd disklabel
   c   toggle the dos compatibility flag
   d   delete a partition
   l   list known partition types
   m   print this menu
   n   add a new partition
   o   create a new empty DOS partition table
   p   print the partition table
   q   quit without saving changes
   s   create a new empty Sun disklabel
   t   change a partition's system id
   u   change display/entry units
   v   verify the partition table
   w   write table to disk and exit
   x   extra functionality (experts only)

Command (m for help):
```

- So many commands available first we delete all partitions and create fresh partition table
- press “d” for deletion of partition

```
Command (m for help): d
Partition number (1-4): 1

Command (m for help): d
Selected partition 2

Command (m for help): p

Disk /dev/sdb: 7948 MB, 7948206080 bytes
245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0004c942

   Device Boot      Start         End      Blocks   Id  System

Command (m for help):
```

- Here i deleted existing partitions and "p" is the command to print all existing partitions so here there is no partitions
- Now am creating partitionings using "n" command

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1):
Using default value 1
First sector (2048-15523839, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-15523839, default 15523839): +512M

Command (m for help): n
Partition type:
   p   primary (1 primary, 0 extended, 3 free)
   e   extended
Select (default p): p
Partition number (1-4, default 2):
Using default value 2
First sector (1050624-15523839, default 1050624):
Using default value 1050624
Last sector, +sectors or +size{K,M,G} (1050624-15523839, default 15523839):
Using default value 15523839

Command (m for help): p

Disk /dev/sdb: 7948 MB, 7948206080 bytes
245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0004c942

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048     1050623      524288   83  Linux
/dev/sdb2         1050624    15523839     7236608   83  Linux

Command (m for help):
```

- Here i created two primary partitions in that for first partition i assigned 512MB and rest of the memory assigned to partition two
- In embedded boards u-boot is compatible with FAT file system and in two partitions one is used for loadable files and another used for root filesystem.
- If you want boot your board from sd card you need create one boot partition and one root partition.
- Now change the system id of partition 1 using "t"

```
Command (m for help): t
Partition number (1-4): 1
Hex code (type L to list codes): L

 0  Empty           24  NEC DOS         81  Minix / old Lin bf  Solaris
 1  FAT12           27  Hidden NTFS Win 82  Linux swap / So c1  DRDOS/sec (FAT-
 2  XENIX root      39  Plan 9          83  Linux           c4  DRDOS/sec (FAT-
 3  XENIX usr       3c  PartitionMagic  84  OS/2 hidden C:  c6  DRDOS/sec (FAT-
 4  FAT16 <32M      40  Venix 80286     85  Linux extended  c7  Syrinx
 5  Extended        41  PPC PReP Boot   86  NTFS volume set da  Non-FS data
 6  FAT16           42  SFS             87  NTFS volume set db  CP/M / CTOS / .
 7  HPFS/NTFS/exFAT 4d  QNX4.x          88  Linux plaintext de  Dell Utility
 8  AIX             4e  QNX4.x 2nd part 8e  Linux LVM       df  BootIt
 9  AIX bootable    4f  QNX4.x 3rd part 93  Amoeba          e1  DOS access
 a  OS/2 Boot Manag 50  OnTrack DM      94  Amoeba BBT      e3  DOS R/O
 b  W95 FAT32       51  OnTrack DM6 Aux 9f  BSD/OS          e4  SpeedStor
 c  W95 FAT32 (LBA) 52  CP/M            a0  IBM Thinkpad hi eb  BeOS fs
 e  W95 FAT16 (LBA) 53  OnTrack DM6 Aux a5  FreeBSD         ee  GPT
 f  W95 Ext'd (LBA) 54  OnTrackDM6      a6  OpenBSD         ef  EFI (FAT-12/16/
10  OPUS            55  EZ-Drive        a7  NeXTSTEP        f0  Linux/PA-RISC b
11  Hidden FAT12    56  Golden Bow      a8  Darwin UFS      f1  SpeedStor
12  Compaq diagnost 5c  Priam Edisk     a9  NetBSD          f4  SpeedStor
14  Hidden FAT16 <3 61  SpeedStor       ab  Darwin boot     f2  DOS secondary
16  Hidden FAT16    63  GNU HURD or Sys af  HFS / HFS+      fb  VMware VMFS
17  Hidden HPFS/NTF 64  Novell Netware  b7  BSDI fs         fc  VMware VMKCORE
18  AST SmartSleep  65  Novell Netware  b8  BSDI swap       fd  Linux raid auto
1b  Hidden W95 FAT3 70  DiskSecure Mult bb  Boot Wizard hid fe  LANstep
1c  Hidden W95 FAT3 75  PC/IX           be  Solaris boot    ff  BBT
1e  Hidden W95 FAT1 80  Old Minix
Hex code (type L to list codes): b
Changed system type of partition 1 to b (W95 FAT32)
```

- I changed my partition 1 id as W95 FAT32

```
Command (m for help): p

Disk /dev/sdb: 7948 MB, 7948206080 bytes
245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
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Disk identifier: 0x0004c942

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048     1050623      524288    b  W95 FAT32
/dev/sdb2         1050624    15523839     7236608   83  Linux

Command (m for help): ^[[B
```

- Enable the boot flag for partition 1 using " a" command

```
Command (m for help): a
Partition number (1-4): 1

Command (m for help): p

Disk /dev/sdb: 7948 MB, 7948206080 bytes
245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
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   Device Boot      Start         End      Blocks   Id  System
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Command (m for help):
```

- Then alter the previous partition table with new partitions using "w" this will overwrite the partition table

```
Command (m for help):   w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information.
Syncing disks.
root@veda:/home/documents#
```

SD Card Formating

Formating means creation of file system on the disk for accessing.

Upto now we partitioned the card but its not accessable with out creating any file system .

Here we create Fat file system for boot partition and linux Ext3 file system for root partition.

- For formating in linux widely used tool is mkfs.
- Before doing format unmount the partitions.
- For Fat filesystem command as follows.

- mkfs.vfat -F 32 /dev/sdb1 -n BOOT

```
root@veda:/home/documents# mkfs.vfat -F 32 /dev/sdb1 -n BOOT
mkfs.fat 3.0.26 (2014-03-07)
root@veda:/home/documents#
```

- For Ext3 linux filesysem command is

  mkfs.ext3 /dev/sdb2 -L ROOT

```
root@veda:/home/documents# mkfs.ext3 /dev/sdb2 -L ROOT
mke2fs 1.42.9 (4-Feb-2014)
Filesystem label=ROOT
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
452480 inodes, 1809152 blocks
90457 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=1853882368
56 block groups
32768 blocks per group, 32768 fragments per group
8080 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

root@veda:/home/documents#
```