

Linux Howto's

Partitions, File Systems and Mounts (121)

CIS 191 - Fall 2008

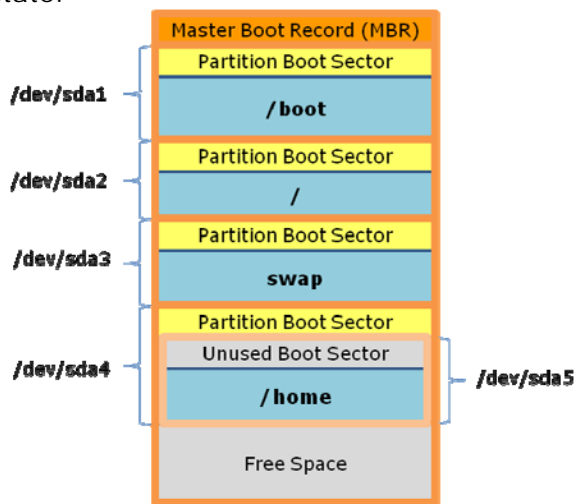
Partitions, File Systems and Mounts (121)

Red Hat 9 has been installed into a VM. There is some free disk space at the end of the 1st 5 GB drive. There is also an empty 2nd 2GB drive. An ext2 file system will be added to the end of the 1st drive and an ext3 file system into a logical partition on the 2nd drive. A primary partition will not be put on the 2nd drive to demonstrate how Linux numbers partitions.

Requirements:

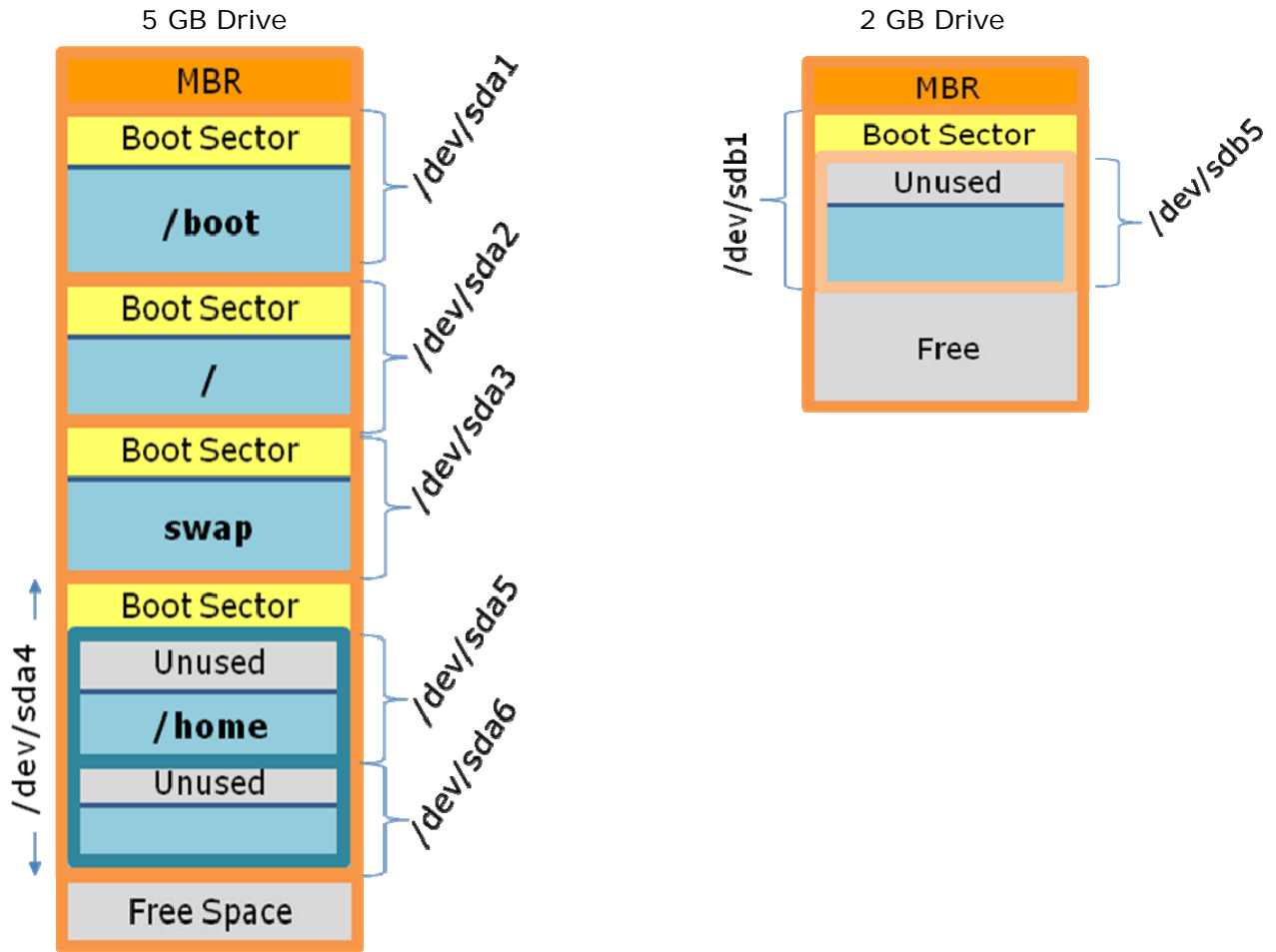
- VM made in Lesson 2:
homer
- VMWare Server 1.05
<http://www.vmware.com/products/server/>

Initial state:



Location	Type	Boot Code	Usage
MBR		GRUB	
/dev/sda1	Primary		/boot
/dev/sda2	Primary		/
/dev/sda3	Primary		swap
/dev/sda4	Extended		
/dev/sda5	Logical		/home
free			

Desired state:



/dev/sda

Location	Type	Boot Code	Usage
MBR		Microsoft	
/dev/sda1	Primary		DOS
/dev/sda2	Primary	GRUB	/boot
/dev/sda3	Primary		swap
/dev/sda4	Extended		
/dev/sda5	Logical		/
/dev/sda6	Logical		
free			

/dev/sdb

Location	Type	Boot Code	Usage
MBR		Microsoft	
/dev/sdb1	Extended		
/dev/sdb5	Logical		
free			

Show initial state

```
[root@homer root]# fdisk -l
```

```
Disk /dev/sda: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	13	104391	83	Linux
/dev/sda2		14	332	2562367+	83	Linux
/dev/sda3		333	365	265072+	82	Linux swap
/dev/sda4		366	652	2305327+	5	Extended
/dev/sda5		366	492	1020096	83	Linux

```
Disk /dev/sdb: 2147 MB, 2147483648 bytes
255 heads, 63 sectors/track, 261 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

```
Disk /dev/sdb doesn't contain a valid partition table
```

Add 100 MB partition to end of 1st drive

```
[root@homer root]# fdisk /dev/sda
```

```
Command (m for help): p
```

```
Disk /dev/sda: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	13	104391	83	Linux
/dev/sda2		14	332	2562367+	83	Linux
/dev/sda3		333	365	265072+	82	Linux swap
/dev/sda4		366	652	2305327+	5	Extended
/dev/sda5		366	492	1020096	83	Linux

```
Command (m for help): n
```

```
First cylinder (493-652, default 493):
```

```
Using default value 493
```

```
Last cylinder or +size or +sizeM or +sizeK (493-652, default 652): +100M
```

```
Command (m for help): p
```

```
Disk /dev/sda: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	13	104391	83	Linux
/dev/sda2		14	332	2562367+	83	Linux
/dev/sda3		333	365	265072+	82	Linux swap

```
/dev/sda4      366      652   2305327+   5  Extended
/dev/sda5      366      492   1020096   83  Linux
/dev/sda6      493      505   104391    83  Linux
```

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

```
Calling ioctl() to re-read partition table.
```

```
WARNING: Re-reading the partition table failed with error 16: Device or
resource busy.
```

```
The kernel still uses the old table.
```

```
The new table will be used at the next reboot.
```

```
Syncing disks.
```

```
[root@homer root]#
```

Force kernel to recognize new partition with partprobe

```
[root@homer root]# partprobe
```

Put a ext2 file system on the new partition

```
[root@homer root]# mkfs -t ext2 /dev/sda6
mke2fs 1.32 (09-Nov-2002)
Filesystem label=
OS type: Linux
Block size=1024 (log=0)
Fragment size=1024 (log=0)
26104 inodes, 104391 blocks
5219 blocks (5.00%) reserved for the super user
First data block=1
13 block groups
8192 blocks per group, 8192 fragments per group
2008 inodes per group
Superblock backups stored on blocks:
    8193, 24577, 40961, 57345, 73729
```

```
Writing inode tables: done
```

```
Writing superblocks and filesystem accounting information: done
```

```
This filesystem will be automatically checked every 29 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
```

```
[root@homer root]#
```

Mount new file system and add a file

```
[root@homer root]# ls /mnt
cdrom floppy hgfs
[root@homer root]#
[root@homer root]# mount /dev/sda6 /mnt
[root@homer root]# cd /mnt
[root@homer mnt]# echo "This is the first file to go here" > example
[root@homer mnt]# cd
[root@homer root]# ls -l /mnt
total 13
-rw-r--r--  1 root  root           34 Sep 14 15:45 example
```

```
drwx-----  2 root    root          12288 Sep 14 15:39 lost+found
[root@homer root]# cat /mnt/example
This is the first file to go here
[root@homer root]#
```

Show current mounts

```
[root@homer root]# mount
/dev/sda2 on / type ext3 (rw)
none on /proc type proc (rw)
/dev/sda1 on /boot type ext2 (rw)
none on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/sda5 on /home type ext3 (rw)
none on /dev/shm type tmpfs (rw)
/dev/sda6 on /mnt type ext2 (rw)
[root@homer root]#
```

Un-mount new file system

```
[root@homer root]# ls /mnt
cdrom floppy hgfs
[root@homer root]#
```

Add extended and logical partition to 2nd drive

```
[root@homer root]# fdisk /dev/sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF
disklabel
Building a new DOS disklabel. Changes will remain in memory only,
until you decide to write them. After that, of course, the previous
content won't be recoverable.
```

```
Warning: invalid flag 0x0000 of partition table 4 will be corrected by
w(rite)
```

```
Command (m for help): p
```

```
Disk /dev/sdb: 2147 MB, 2147483648 bytes
255 heads, 63 sectors/track, 261 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
--------	------	-------	-----	--------	----	--------

```
Command (m for help): n
```

```
Command action
```

```
  e   extended
```

```
  p   primary partition (1-4)
```

```
e
```

```
Partition number (1-4): 1
```

```
First cylinder (1-261, default 1):
```

```
Using default value 1
```

```
Last cylinder or +size or +sizeM or +sizeK (1-261, default 261): +1000M
```

```
Command (m for help): p
```

```
Disk /dev/sdb: 2147 MB, 2147483648 bytes
```

255 heads, 63 sectors/track, 261 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		1	123	987966	5	Extended

Command (m for help): n

Command action

l logical (5 or over)
p primary partition (1-4)

l

First cylinder (1-123, default 1):

Using default value 1

Last cylinder or +size or +sizeM or +sizeK (1-123, default 123): +100m

Command (m for help): p

Disk /dev/sdb: 2147 MB, 2147483648 bytes
255 heads, 63 sectors/track, 261 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		1	123	987966	5	Extended
/dev/sdb5		1	13	104359+	83	Linux

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.

The kernel still uses the old table.

The new table will be used at the next reboot.

Syncing disks.

[root@homer root]#

Force kernel to recognize new partition so we can mount it later

[root@homer root]# partprobe

[root@homer root]#

Put an ext3 file system on the new logical partition

[root@homer root]# mkfs -t ext3 /dev/sdb5

mke2fs 1.32 (09-Nov-2002)

Filesystem label=

OS type: Linux

Block size=1024 (log=0)

Fragment size=1024 (log=0)

26104 inodes, 104359 blocks

5217 blocks (5.00%) reserved for the super user

First data block=1

13 block groups

8192 blocks per group, 8192 fragments per group

2008 inodes per group

Superblock backups stored on blocks:
8193, 24577, 40961, 57345, 73729

Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 32 mounts or
180 days, whichever comes first. Use tune2fs -c or -i to override.
[root@homer root]#

Mount new file system and create a file on it

```
[root@homer root]# mount /dev/sdb5 /mnt
[root@homer root]# ls
anaconda-ks.cfg  install.log  install.log.syslog  test
[root@homer root]# cd /mnt
[root@homer mnt]# ls
lost+found
[root@homer mnt]# echo "This is going on the second drive" > example2
[root@homer mnt]# cd
[root@homer root]# ls /mnt
example2  lost+found
[root@homer root]# cat /mnt/example2
This is going on the second drive
```

Show current mounts

```
[root@homer root]# mount
/dev/sda2 on / type ext3 (rw)
none on /proc type proc (rw)
/dev/sda1 on /boot type ext2 (rw)
none on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/sda5 on /home type ext3 (rw)
none on /dev/shm type tmpfs (rw)
/dev/sdb5 on /mnt type ext3 (rw)
[root@homer root]#
```

Show the new partitions on both drives

```
[root@homer root]# fdisk -l
```

```
Disk /dev/sda: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	13	104391	83	Linux
/dev/sda2		14	332	2562367+	83	Linux
/dev/sda3		333	365	265072+	82	Linux swap
/dev/sda4		366	652	2305327+	5	Extended
/dev/sda5		366	492	1020096	83	Linux
/dev/sda6		493	505	104391	83	Linux

```
Disk /dev/sdb: 2147 MB, 2147483648 bytes
255 heads, 63 sectors/track, 261 cylinders
```

Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		1	123	987966	5	Extended
/dev/sdb5		1	13	104359+	83	Linux

[root@homer root]#

Un-mount new file system

```
[root@homer root]# umount /mnt
[root@homer root]#
[root@homer root]# ls /mnt
cdrom floppy hgfs
[root@homer root]#
```