– General Linux 1 –

Design Hard Disk Layout [2]

(Linux Professional Institute Certification)

a


```
   .~.
   /V\      by: geoffrey robertson
  // \\         geoffrey@zip.com.au
  @._.@
```



```
$Id: gl1.102.1.slides.tex,v 1.2 2003/05/30 05:00:47 waratah Exp $
```

(2.2) 102 Installation & Package Mgt. [24]

1.102.1 **Design hard disk layout [2]**

1.102.2 Install a boot manager [3]

1.102.3 Make and install programs from source [5]

1.102.4 Manage shared libraries [3]

1.102.5 Use Debian package management [5]

1.102.6 Use Red Hat Package Manager (RPM) [6]

Design hard disk layout [2]

Objective

Candidates should be able to design a disk partitioning scheme for a Linux system. This objective includes allocating filesystems or swap space to separate partitions or disks, and tailoring the design to the intended use of the system. It also includes placing `/boot` on a partition that conforms with the BIOS' requirements for booting.

Design hard disk layout [2]

Key files, terms, and utilities

/ (root) filesystem

/var filesystem

/home filesystem

swap space

mount points

partitions

cylinder 1024

Resources of interest

Linux Partitioning Mini-FAQ

http://pw1.netcom.com/~kmself/Linux/FAQs/partition.html

IA32 Disk Partitions

Primary Partitions

On i386 systems disks may be sliced up into to 15 partitions.

(It may be possible to have 63 or more partitions in IDE disk drives)

- The disk must have at least 1 primary partition.

  ```
  /dev/hda1
  ```

- There may be up to 4 primary partitions.

  ```
  /dev/hda1   (primary)
  /dev/hda2   (primary)
  /dev/hda3   (primary)
  /dev/hda4   (primary)
  ```

IA32 Disk Partitions

Logical Partitions

On i386 systems disks may be sliced up into to 15 partitions.

- One of the 4 primary partitions may be made into an extended partition.
- The one extended partition must hold between 1 and 12 logical partitions.

```
/dev/hda1   (primary)
/dev/hda2   (extended)
/dev/hda5   (logical)
/dev/hda6   (logical)
...
/dev/hda16 (logical)
```

Linux Partitioning mini-FAQ

Basic Recommendation

/	50 – 100 MB
/tmp	50 – 100 MB
/var	200 – 500 MB
/usr	1 – 2+ GB
/usr/local	1 – 2+ GB
/home	remainder

Linux Partitioning mini-FAQ

Swap

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Linux Partitioning mini-FAQ

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- Traditional recommendation is 2x physical RAM
- Karsten M. Self uses 3x physical RAM
- Large amounts of swap should be divided across several partitions and preferably across several spindles.

Linux Partitioning mini-FAQ

Root partition

The root partition must have:

- `/bin`
- `/dev`
- `/etc`
- `/initrd`
- `/lib`
- `/root`
- `/sbin`

Other directory trees may be distributed on other partitions/spindles.

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/home Variable content, usually most sensitive data both in terms of security and integrity. Can be mounted nosuid.

Linux Partitioning mini-FAQ

Typical Desktop

```
 Filesystem 1k-blocks    Used Available Use% Mounted on
/dev/hda3     152247   33526    110859  24% /
/dev/hda6     249871    2004    234967   1% /tmp
/dev/sda7     585008  457456     97836  83% /var
/dev/hda5     495960   87588    382772  19% /var/spool/news
/dev/sdb2    1929100 1518288    312816  83% /usr
/dev/sda5    1209572  574152    573976  51% /usr/local
/dev/hda7     378711  213496    145662  60% /usr/local/data
/dev/hda2    1007992  584132    372656  62% /home
/dev/hda1     157044  119252     37792  76% /mnt/dos
```

Linux Partitioning mini-FAQ

Typical Desktop `fdisk /dev/hda`

```
Disk /dev/hda: 128 heads, 63 sectors, 620 cylinders
Units = cylinders of 8064 * 512 bytes

   Device Boot    Start       End    Blocks   Id  System
/dev/hda1             1        39    157216+   6  FAT16
/dev/hda2            40       293   1024128   83  Linux
/dev/hda3   *       294       332    157248   83  Linux
/dev/hda4           333       620   1161216    5  Extended
/dev/hda5           333       459    512032+  83  Linux
/dev/hda6           460       523    258016+  83  Linux
/dev/hda7           524       620    391072+  83  Linux
```

Linux Partitioning mini-FAQ

Typical Desktop `fdisk /dev/sda`

```
Disk /dev/sda: 255 heads, 63 sectors, 261 cylinders
Units = cylinders of 16065 * 512 bytes

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1               1          17      136521   82  Linux swap
/dev/sda2              18         261     1959930    5  Extended
/dev/sda5              18         170     1228941   83  Linux
/dev/sda6             171         187      136521   82  Linux swap
/dev/sda7             188         261      594373+  83  Linux
```

Linux Partitioning mini-FAQ

Typical Desktop `fdisk /dev/sdb`

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

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1               1          17      136521   82  Linux swap
/dev/sdb2              18         261     1959930   83  Linux
```

Linux Partitioning mini-FAQ

Typical Desktop `/etc/fstab`

```
/dev/hda3      /               ext2 defaults,errors=remount-ro          0 1
proc           /proc           proc defaults                            0 0
/dev/hda6      /tmp            ext2 defaults,nosuid,nodev               0 2
/dev/sda7      /var            ext2 defaults,nosuid,nodev               0 2
/dev/hda5      /var/spool/news ext2 defaults,nosuid,noexec,nodev        0 2
/dev/sdb2      /usr            ext2 defaults,rw,nodev                   0 2
/dev/sda5      /usr/local      ext2 defaults,rw,nosuid,nodev            0 2
/dev/hda7      /usr/local/data ext2 defaults,nosuid,nodev               2 2
/dev/hda2      /home           ext2 defaults,nosuid,nodev               0 2

/dev/hdc       /mnt/cdrom      iso9660 noauto,user,ro,nodev,nosuid      2 2
/dev/fd0       /mnt/floppy     auto noauto,gid=disk,umask=007,rw,user   2 2
/dev/hda1      /mnt/dos    vfat auto,user,nosuid,nodev,gid=6,umask=002 2 2

/dev/sda1      none            swap    sw          0       0
/dev/sdb1      none            swap    sw          0       0
/dev/sda6      none            swap    sw          0       0
```

The End