

Table of Contents

Dedication	7
Source and pre-formatted versions available	8
1. Introduction	9
The Linux Documentation Project	11
2. Overview of a Linux System	12
Various parts of an operating system	12
Important parts of the kernel	12
Major services in a UNIX system	14
init	14
Logins from terminals	14
Syslog	15
Periodic command execution: cron and at	15
Graphical user interface.....	15
Networking	15
Network logins	16
Network file systems	16
Mail.....	16
Printing	17
The filesystem layout.....	17
3. Overview of the Directory Tree	19
Background	19
The root filesystem.....	21
The /etc directory	23
The /dev directory	25
The /usr filesystem.....	26
The /var filesystem.....	27
The /proc filesystem	28
4. Using Disks and Other Storage Media.	32
Two kinds of devices	32
Hard disks	33
Floppies	36
CD-ROM's	37
Tapes	38
Formatting	38
Partitions	41
The MBR, boot sectors and partition table.....	41

Extended and logical partitions	42
Partition types	43
Partitioning a hard disk	44
Device files and partitions	45
Filesystems.....	45
What are filesystems?	45
Filesystems galore	46
Which filesystem should be used?.....	49
Creating a filesystem	49
Mounting and unmounting	51
Checking filesystem integrity with fsck	55
Checking for disk errors with badblocks	55
Fighting fragmentation	56
Other tools for all filesystems.....	56
Other tools for the ext2 filesystem.....	57
Disks without filesystems.....	58
Allocating disk space	59
Partitioning schemes.....	59
Space requirements.....	60
Examples of hard disk allocation	60
Adding more disk space for Linux	61
Tips for saving disk space.....	61
5. Memory Management	63
What is virtual memory?	63
Creating a swap space	63
Using a swap space	64
Sharing swap spaces with other operating systems.....	66
Allocating swap space.....	66
The buffer cache.....	67
6. Boots And Shutdowns.....	70
An overview of boots and shutdowns	70
The boot process in closer look.....	71
More about shutdowns	73
Rebooting	74
Single user mode	75
Emergency boot floppies	75
7. init.....	76
init comes first	76
Configuring init to start getty : the <code>/etc/inittab</code> file	76

Run levels.....	78
Special configuration in /etc/inittab.....	79
Booting in single user mode.....	79
8. Logging In And Out.....	81
Logins via terminals.....	81
Logins via the network.....	83
What login does	84
X and xdm	84
Access control	84
Shell startup.....	85
9. Managing user accounts.....	86
What's an account?	86
Creating a user	86
/etc/passwd and other informative files	86
Picking numeric user and group ids	87
Initial environment: /etc/skel	87
Creating a user by hand	88
Changing user properties	89
Removing a user.....	89
Disabling a user temporarily	90
10. Backups.....	92
On the importance of being backed up	92
Selecting the backup medium	93
Selecting the backup tool	93
Simple backups	94
Making backups with tar	94
Restoring files with tar	96
Multilevel backups	97
What to back up	99
Compressed backups	99
11. Keeping Time	101
Time zones	101
The hardware and software clocks	102
Showing and setting time	102
When the clock is wrong	103
Glossary (DRAFT).....	105

List of Tables

4-1. Partition types (from the Linux fdisk program).	43
7-1. Run level numbers	78
10-1. Efficient backup scheme using many backup levels.	98

List of Figures

2-1. Some of the more important parts of the Linux kernel	12
3-1. Parts of a Unix directory tree. Dashed lines indicate partition limits.	19
4-1. A schematic picture of a hard disk.	34
4-2. A sample hard disk partitioning.	42
4-3. Three separate filesystems.	51
4-4. /home and /usr have been mounted.	51
4-5. Sample output from dumpe2fs	57
8-1. Logins via terminals: the interaction of init , getty , login , and the shell.	81
10-1. A sample multilevel backup schedule.	97