

Contents

Foreword	ix
Preface	xi
Acknowledgments	xvi

Part I: Getting Started

1

Chapter 1: Introduction to Linux	3
Understanding the Role of the Operating System	3
History of GNU/Linux	5
Linux versus Other Operating Systems	6
The Word on Free Software and Open Source	8
What's So Special about GNU/Linux?	8
Understanding the Debian Distribution	10
Chapter 2: Installing Debian	13
Preparing Your System	13
Basic Debian Installation	15
Booting off the CD	16
The main menu	16
Configuring the keyboard	17
Partitioning a hard disk	17
Initializing and activating a swap partition	18
Initializing a Linux partition	18
Initializing the operating system kernel and modules	19
Configuring device driver modules	20
Configuring the network	21
Installing the base system	22
Configuring the base system	23
Booting Linux directly from the hard drive	24
Making a boot floppy	24
Rebooting the system	25

Configuring the Debian system	25
Apt configuration	27
Using the Debian Package-Management System	31
What are deb packages?	32
Adding deb packages	32
Changing the package archive source	35
Gnome-apt	36
Installing Non-Debian Software	37
RPM packages	37
tar packages	38
Chapter 3: First Steps as a Linux User	41
Logging In and Out of Linux	41
Basic Navigation with Linux	43
Finding special file locations	43
Finding ready-reference documentation	45
Maneuvering through the files	48
Stopping the System	56
Using the reboot, halt, and poweroff commands	56
Using the shutdown command	57
Working with the Filesystem and Related Commands	58
Mounting drives	59
Chapter 4: Choosing a GUI	63
Linux's Graphical User Interface	63
Deciding on a Graphical Interface	65
Installing and Configuring the X Environment	66
X system requirements	67
Installing fonts	68
Installing the Display Manager	69
XF86Setup	69
Starting the X server	76
Starting X remotely	76
Managing the X server	77
Installing and Using Window Managers	79
FVWM	79
Enlightenment	81
Window Maker	83

Installing and Using Desktop Environments	84
GNOME	84
KDE	86
Troubleshooting Your New Components	88
Chapter 5: Networking	91
Components of the Linux Network	91
TCP/IP Network Protocols	92
IP addresses	93
Network classes	94
Ports and services	95
Netmasks	95
Understanding Host Names	96
Understanding Domain Names and the DNS	97
Setting Up the Physical Network	100
Ethernet cards	100
Hubs and switches	101
Cables	101
Setting Up the Network	103
Making Changes to the Network	104
Making manual changes	104
Adding IP addresses to one Ethernet card	105
Troubleshooting the Network	105
Using dmesg to troubleshoot	106
Using ifconfig to troubleshoot	106
Using ping to troubleshoot	108
Using traceroute to troubleshoot	109
Using route to troubleshoot	110
Chapter 6: Setting Up for the Internet	113
Connecting to an ISP	113
Using wvdial to connect	114
Using diald to connect	115
Web Browsers	118
E-Mail Clients	118
Balsa	119
Netscape	120
mutt	121

mail	122
Mail utilities	122
News Clients	125
PAN	125
Netscape	126
tin newsreader	126
FTP Clients	127
Telnet	128
Dial-in PPP Server Setup	129

Part II: Working with Debian**131****Chapter 7: Applications** **133**

Installing Applications	133
Using the Windows Application with Linux	134
DOSEMU	134
Wine	136
VMware	140
Plex86	142
Graphics Programs	143
Gimp	143
ImageMagick	146
Browsers	148
Lynx	148
Mozilla	151
Opera	152
Netscape	153

Chapter 8: Productivity Applications **157**

StarOffice	157
Installation	158
The StarOffice desktop	160
Applixware	166
Installation	166
Navigating Applixware	167

Alternatives	171
Gnome Office	172
Publishing documents with text files	174
TeX	174
Groff	175
File Converters	177
Chapter 9: Essential Tools	179
Using Text Editors in Debian GNU	179
Learning to use vi	180
Learning to use Emacs	186
Using Commands and Programs	188
alias	188
grep	188
find	189
locate	191
cat	191
top	192
The more program	194
The less program	195
Automating Tasks	196
The at command	197
The batch command	198
The cron command	198
The anacron command	200
Chapter 10: Multimedia	203
Listening to Audio Files	203
Audio file formats	206
Audio CDs	207
MP3 on Linux	209
Recording CDs	210
Streaming audio	212
Watching Videos	214
MPEG videos	215
DVD videos	215
Using Live Voice Chat	216

Chapter 11: Games 217

System Considerations for Gaming	217
Graphical interfaces	217
Sound system requirements	218
Other system demands	219
Playing Debian-Packaged Games	219
Adventure games	220
Arcade games	221
Board games	222
Card games	223
Simulation games	224
Strategy games	225
Multi-player games	226
GNOME games	228
Playing Commercial Games	229
SimCity 3000 Unlimited	231
Unreal Tournament	232

Part III: Administering Linux 235**Chapter 12: System Administration 237**

The Roles of the System Administrator	237
The System Administrator and the Root Account	239
Using the su command	240
Using the sudo command	241
Administering and Setting up Accounts	242
The passwd file	242
The purpose of shadow passwords	243
The group file	243
Employing adduser to add a user account	244
The new user template—skel	245
Using userdel to remove a user	246
Restricting access to the root account	246
Setting File and Directory Permissions	246
Access with chmod	247
Changing user ownership with chown	249
Changing group membership with chgrp	250

Using Quotas for Accounts	251
Installing quotas	251
Using edquota	252
Quota reporting	253
Using System Monitoring Tools	255
Monitoring system log files	255
Disk monitoring	258
User monitoring	260
Automated monitoring	263
Chapter 13: Scripting	265
Working with Perl	265
Finding documentation for Perl	265
Using modules	267
Using Java	272
Using Kaffe and the Sun JDK	273
Using gcj	273
Finding documentation for Java	274
Using Java libraries	274
Troubleshooting	275
Using Tcl/Tk	276
Finding documentation for Tcl/Tk	277
Adding Tcl/Tk libraries	277
Programming With Python	278
Finding documentation for Python	278
Installing Python libraries	279
Using C/C++	282
Finding C/C++ documentation	284
Using C/C++ tools	285
Using C/C++ libraries	286
Chapter 14: Shells	293
What Is a Shell?	293
Using the shell	294
The Command Line	294
Standard input and output	295
Command substitution	298

Jobs and job control	300
Escaping—special characters	303
Shell variables	303
The Shell Variants	306
Bourne shell	306
C shell	308
Korn shell	309
Special shell characters	310
Shell Scripts	311
Chapter 15: Linux Kernel	313
Configuring the Linux Kernel	313
Kernel code and versions	315
Kernel modules	316
Adding modules on the fly	317
Upgrading and updating the kernel	318
Making changes to the kernel	319
Compiling and installing a new kernel	322
Using the Linux Boot Loader	324
Configuring LILO	325
Adding the new kernel to LILO	326
Booting to other operating systems	327
Testing and installing a new LILO configuration	327
System Initialization	328
Run levels	330
Initialization scripts	331
Adding and removing daemon programs	334
Part IV: Maintenance and Upgrade	335
Chapter 16: Finding Updated Files	337
Defining System Bugs	337
Bugless software	338
Stable versus secure	339
Bugs versus features	339
Getting help and reporting bugs	340
Patches that fix bugs	341

Updating Debian Files with the Package-Management System	341
Upgrading from an older Debian version	343
Upgrading over the Internet	343
Upgrading from installation CD-ROMs	345
Chapter 17: Hardware	347
Finding Linux-Compatible Hardware	347
Finding Linux-Compatible Laptops	353
Adding Hardware to Your Linux System	356
Hard drives and CD-ROM drives	357
Changing video cards	358
Adding and changing network cards	359
Adding Peripheral Devices	361
Iomega drives (Zip, Jaz, and so on)	361
Scanners	362
Printing	362
Offline printing	365
Setting up printer queues	367
Apsfilter configuration tool	368
Chapter 18: Backups	371
Planning for Failure	371
Choosing a Backup Technique	372
Knowing what to back up	373
Knowing what to back up with caution	374
Choosing adequate media	375
Choosing a backup method	377
Selecting Your Backup and Restore Tools	378
amanda	379
dump/restore	382
KBackup	385
mirrordir	387
Taper	388
tar	389
Creating a backup using a CD-ROM	390

Recovering from a Crashed System	392
Rescue disk boot options	393
Fixing disk problems	393

Part V: Linux Server**395****Chapter 19: Security** **397**

Understanding the Need for Security	397
Avoiding crackers	398
Tools of the Trade	399
Authentication tools	399
Network monitoring tools	401
Service and integrity tools	402
Diagnostic tools	402
Other helpful tools	404
Limiting the Available Services	405
Viruses, worms, and other creepy things	407
Setting secure permissions	407
A word about passwords	408
Tips for Securing Your System	409
The compromised system	412
Sources for additional information	413

Chapter 20: Firewall **415**

Protecting a Network	415
Hardware Requirements and Preparations	416
Adding a Second Network Card	417
Using ipchains	419
Masquerading a Private Network	422
Configuring a Firewall with PMFirewall	423
Locking Down the Firewall	425
Squid Proxy Service	426
Accessing the Internet through a Firewall/Proxy	428

Chapter 21: Web Server	431
Introduction to Apache Web Server	431
Installing the Apache Server	432
Configuration files	434
The httpd.conf configuration file	434
The srm.conf configuration file	444
The access.conf configuration file	453
Controlling the daemon	456
Monitoring the Web server	456
Setting Controls for Web Pages	457
.htaccess	458
htpasswd	459
Enabling Virtual Hosting	460
Chapter 22: FTP Server	463
All About FTP	463
Anonymous FTP	464
Installing and Configuring an FTP Server	465
The ftpd server	465
The wu-ftpd server	466
The proftpd server	472
Administering an FTP Server	475
Using FTP Clients	476
The ftp client	476
The ncftp client	478
The xftp client	481
gftp clients	482
Browsers	483
Chapter 23: Network Information System	485
The Network Information System	485
An overview of NIS	486
Configuring a Master NIS Server	487
Configuring a NIS Client	489
Configuring a NIS Slave Server	490
Using NIS Tools	491
Administering NIS	492

Chapter 24: File Server	495
Using the Network File System	496
Installing and running NFS	496
Setting up the NFS shares in /etc/exports	497
Mounting an NFS share automatically	499
Mounting an NFS file system manually	501
Unmounting an NFS filesystem	502
Sharing Files Using Samba	502
Installing Samba	503
Configuring Samba	503
Testing the Samba server	511
Configuring Samba with SWAT	512
Configuring Samba with gnosamba	513
Checking the network with smb-nat	514
Connecting to a Samba server from Linux	514
Connecting to a Samba server from Windows	515
Sharing files between Linux and Windows machines	515
Chapter 25: Mail	517
Understanding Internet E-Mail Protocols and Standards	517
exim	519
Using Sendmail	525
Questions during installation	525
Alternatively configuring sendmail	528
Testing and using sendmail	529
General Mail Considerations	530
E-mail aliases	530
Forwarding your mail	531
Virtual mail server	532
DNS and Internet mail	533
Using mailing lists	534
Setting Up POP	534
Installing and configuring POP	534
Testing POP	535
Setting Up IMAP	536
Installation and configuration	536
Testing IMAP	536
Getting Help	537

Appendix A: What's On the CD-ROM	539
Using the CD with Linux	539
What's On the CD	539
Applications	540
Source code	540
Troubleshooting	541
Appendix B: Linux Commands	543
Linux Commands	543
bin commands	544
sbin commands	545
usr commands	547
Appendix C: Debian Packages	557
Administration utilities	557
Base utilities	562
Communication programs	565
Editors	566
Graphics	571
Mail	577
Miscellaneous	582
Network	588
Newsgroups	599
Other OS's and file systems	600
Shells	603
Sound	603
Utilities for I/O and storage	609
Web software	616
Index	625
GNU General Public License.	659
CD-ROM Installation Instructions.	664