Contents

List of Figures vi

List of Tables vii

Foreword ix

Preface xi

1 Becoming Familiar with FreeBSD 1
1.1 Building an X Server and a Window Manager . . . 1
1.2 Customizing Your Desktop Environment . . . 2
1.3 Using PC-BSD . . . 6
1.4 Using DesktopBSD . . . 12
1.5 Fun with X.org . . . 18
1.6 Configuring Java and Flash . . . 25
1.7 Configuring Sound Applications . . . 27
1.8 DVD Playback on FreeBSD . . . 30
1.9 Playing Audio and Video Files with FreeBSD . . . 34
1.10 Tips and Tricks . . . 36
1.11 Odds and Ends . . . 41
1.12 FreeBSD for Linux Users . . . 46
1.13 FreeBSD for Linux Admins . . . 52

2 Useful Unix Tricks 59
2.1 Useful Commands . . . 59
2.2 Finding Things in Unix . . . 64
2.3 Read The Friendly Manpage! – A Tutorial . . . 73
2.4 Working with Text . . . 85
2.5 Using the vi Editor . . . 91
2.6 Customizing the Login Shell . . . 97
2.7 Understanding Shell Prompts . . . 103
2.8 Monitoring Unix Logins . . . 108
2.9 Discovering System Processes . . . 114
2.10 The System Startup Daemon: init . . . 124
2.11 Where the Log Files Live . . . 128
2.12 Getting Cron to Do Our Bidding . . . 134
2.13 Understanding the Automatons . . . 141
2.14 Adding Users to FreeBSD . . . 154

3 Ports, Packages, and PBIs 163

3.1 Ports Tricks . . . 163
3.2 portupgrade . . . 170
3.3 Cleaning and Customizing Your Ports . . . 176
3.4 make for Nonprogrammers . . . 181
3.5 Building Binary PC-BSD Packages . . . 187
3.6 Interesting Ports . . . 194
3.7 Browsing through the Ports Collection . . . 203

4 Bag of Tricks 209
4.1 SETI@home . . . 209
4.2 Running Windows Applications on FreeBSD . . . 211
4.3 Multi-Platform Remote Control . . . 217
4.4 An Introduction to Webmin . . . 220
4.5 Webmail with Usermin . . . 228

5 Filesystems 233
5.1 An Introduction to Unix Permissions . . . 233
5.2 Dividing Your Data . . . 244
5.3 Understanding Filesystem Inodes . . . 252
5.4 Mounting Other Filesystems . . . 256
5.5 Accessing MS-DOS Filesystems . . . 260
5.6 Using FreeBSD's ACLs . . . 265

6 Backups and RAID 279
6.1 Using Software RAID-1 with FreeBSD . . . 279
6.2 Understanding Archivers . . . 284
6.3 Backing up Files with Tar . . . 288
6.4 Understanding CPIO . . . 294
6.5 Archiving with Pax . . . 299

7 Networking 305
7.1 Connecting to the Internet Using PPP or a DSL Modem . . . 305
7.2 Networking with TCP/IP . . . 309
7.3 FreeBSD Networking Basics . . . 315
7.4 Using Wireshark . . . 321
7.5 Accessing a Cisco Router . . . 326

8 Configuring Services 331
8.1 Building a Unix Server . . . 331
8.2 Unix Printing Basics . . . 336
8.3 Setting up a Secure Subversion Server . . . 341
8.4 Accessing Secure Subversion Servers . . . 346
8.5 Understanding Email . . . 353
8.6 Procmail Basics . . . 358
8.7 Filtering Spam with Procmail . . . 362
8.8 Proxy Terminology 101 . . . 366
8.9 HTTP Proxies . . . 370
8.10 SMTP Proxies . . . 376
8.11 Configuring a TFTP Server . . . 384
8.12 Introducing DHCP . . . 391

8.13 Configuring a DHCP Server . . . 396
8.14 DHCP on a Multi-Segment Network . . . 403
8.15 Configuring and Using NFS . . . 409

9 Security 413
9.1 Securing FreeBSD . . . 413
9.2 Avoiding Trojans and Rootkits . . . 422
9.3 Checking System Integrity with tripwire . . . 425
9.4 File Integrity and Anti-DDoS Utilities . . . 432
9.5 One-Time Passwords . . . 439
9.6 PAM . . . 443
9.7 Establishing Good Password Policies . . . 448
9.8 Improving User Passwords with apg . . . 455
9.9 Cracking Passwords to Enhance Security . . . 461
9.10 Hiding Secrets with Steganography . . . 464

10 Firewalls and VPNs 471
10.1 TCP Protocol Layers Explained . . . 471
10.2 Capturing TCP Packets . . . 476
10.3 IP Packets Revealed . . . 484
10.4 Examining ICMP Packets . . . 492
10.5 Scanning Your Network . . . 498
10.6 IPFW Firewall . . . 501
10.7 IPFW: Fine-Tuning Rulesets . . . 507
10.8 IPFW Logging . . . 511
10.9 Monitoring IPFW Logs . . . 516
10.10 Building a Desktop Firewall . . . 519
10.11 Sharing Internet Connections . . . 528
10.12 Cryptographic Terminology 101 . . . 535
10.13 The SSH Cryptosystem . . . 540
10.14 Configuring SSH . . . 546
10.15 VPNs and IPsec Demystified . . . 551
10.16 Configuring IPsec . . . 555
10.17 Debugging IPsec . . . 562
Index . . . 567

List of Figures

1.1 The Tasks menu 9
1.2 Online Update 10
1.3 Update Now! 11
1.4 Choosing an update server 14
1.5 Upgrading packages 15
1.6 Four window managers running simultaneously through Xnest 22
1.7 Watching a remote window 24

4.1 BOINC Manager 210
4.2 Webmin Main Menu 225

5.1 Viewing file properties in Nautilus 267
5.2 Editing ACLs in eiciel 269
5.3 Adding to a user's ACL 271
5.4 ACL properties for the new directory 273
5.5 Adding default ACL properties 275
5.6 Effective ACLs 276
5.7 Files and the default directory ACL 277

8.1 Checking out with rapidsvn 352

10.1 Your new firewall 521
10.2 Inserting a rule 524
10.3 Firewall rules that allow ssh 527
10.4 My complete rulebase 531
10.5 My NAT rule 532
10.6 An HTML firewall log report 535
10.7 VPN gateway to a network 551
10.8 A secure network over an insecure network 552
10.9 A logical VPN diagram 558

List of Tables

1.1 Kernel Modules for Video . . . 19
1.2 DVD Region Codes . . . 31
1.3 Video Player Capabilities . . . 36
1.4 Video MIME Types . . . 37

2.1 Common find Primaries . . . 65
2.2 vi cut-and-paste . . . 95
2.3 Default Shell Prompts . . . 103
2.4 Shell Configuration Files . . . 104
2.5 Signals . . . 119
2.6 /etc/ttys Configuration . . . 125
2.7 Syslog Facilities . . . 131
2.8 Syslog Levels . . . 132
2.9 Syslog Actions . . . 133
2.10 cron Time Fields . . . 135
2.11 cron String Values . . . 136
2.12 Daily Periodic Scripts . . . 143
2.13 Security Scripts . . . 150
2.14 Weekly Scripts . . . 152
2.15 Monthly Scripts . . . 153

5.1 DOS fdisk Slices . . . 246
5.2 Common Device Names . . . 256
5.3 Common Filesystem Types . . . 258

7.1 IPv4 Classes . . . 312
7.2 Reserved Private IP Range . . . 313
7.3 Default Subnet Masks . . . 313

8.1 NetBIOS Node Types . . . 405

9.1 File Integrity Utilities . . . 433
9.2 Common Unix DDoS Agents . . . 436
9.3 Four PAM facilities divided into six primitives . . . 444
9.4 PAM's Control Flags . . . 444
9.5 User Class Capabilities . . . 450

10.1 IP Header . . . 472
10.2 TCP Header . . . 474
10.3 UDP Header . . . 475
10.4 ARP Header . . . 492