

---

---

# Contents

---

---

<b>1. The Debian Project</b>	<b>1</b>
1.1 What Is Debian?	2
1.1.1 A Multi-Platform Operating System	2
1.1.2 The Quality of Free Software	4
1.1.3 The Legal Framework: A Non-Profit Organization	4
1.2 The Foundation Documents	5
1.2.1 The Commitment towards Users	5
1.2.2 The Debian Free Software Guidelines	7
1.3 The Inner Workings of the Debian Project	9
1.3.1 The Debian Developers	9
1.3.2 The Active Role of Users	13
1.3.3 Teams and Sub-Projects	16
<i>Existing Debian Sub-Projects</i>	16
<i>Administrative Teams</i>	17
<i>Development Teams, Transversal Teams</i>	19
1.4 Follow Debian News	20
1.5 The Role of Distributions	22
1.5.1 The Installer: <code>debian-installer</code>	22
1.5.2 The Software Library	22
1.6 Lifecycle of a Release	22
1.6.1 The <i>Experimental</i> Status	23
1.6.2 The <i>Unstable</i> Status	23
1.6.3 Migration to <i>Testing</i>	24
1.6.4 The Promotion from <i>Testing</i> to <i>Stable</i>	25
1.6.5 The <i>Oldstable</i> and <i>Oldoldstable</i> Status	29
<b>2. Presenting the Case Study</b>	<b>31</b>
2.1 Fast Growing IT Needs	32
2.2 Master Plan	32
2.3 Why a GNU/Linux Distribution?	33
2.4 Why the Debian Distribution?	35
2.4.1 Commercial and Community Driven Distributions	35
2.5 Why Debian Jessie?	36
<b>3. Analyzing the Existing Setup and Migrating</b>	<b>39</b>
3.1 Coexistence in Heterogeneous Environments	40

3.1.1 Integration with Windows Machines . . . . .	40
3.1.2 Integration with OS X machines . . . . .	40
3.1.3 Integration with Other Linux/Unix Machines . . . . .	40
3.2 How To Migrate . . . . .	41
3.2.1 Survey and Identify Services . . . . .	41
<i>Network and Processes</i> . . . . .	42
3.2.2 Backing up the Configuration . . . . .	42
3.2.3 Taking Over an Existing Debian Server . . . . .	43
3.2.4 Installing Debian . . . . .	44
3.2.5 Installing and Configuring the Selected Services . . . . .	44

## 4. Installation 47

4.1 Installation Methods . . . . .	48
4.1.1 Installing from a CD-ROM/DVD-ROM . . . . .	48
4.1.2 Booting from a USB Key . . . . .	49
4.1.3 Installing through Network Booting . . . . .	50
4.1.4 Other Installation Methods . . . . .	50
4.2 Installing, Step by Step . . . . .	50
4.2.1 Booting and Starting the Installer . . . . .	50
4.2.2 Selecting the language . . . . .	52
4.2.3 Selecting the country . . . . .	53
4.2.4 Selecting the keyboard layout . . . . .	53
4.2.5 Detecting Hardware . . . . .	54
4.2.6 Loading Components . . . . .	54
4.2.7 Detecting Network Hardware . . . . .	54
4.2.8 Configuring the Network . . . . .	55
4.2.9 Administrator Password . . . . .	55
4.2.10 Creating the First User . . . . .	56
4.2.11 Configuring the Clock . . . . .	57
4.2.12 Detecting Disks and Other Devices . . . . .	57
4.2.13 Starting the Partitioning Tool . . . . .	57
<i>Guided partitioning</i> . . . . .	59
<i>Manual Partitioning</i> . . . . .	61
<i>Configuring Multidisk Devices (Software RAID)</i> . . . . .	62
<i>Configuring the Logical Volume Manager (LVM)</i> . . . . .	62
<i>Setting Up Encrypted Partitions</i> . . . . .	63
4.2.14 Installing the Base System . . . . .	64
4.2.15 Configuring the Package Manager (apt) . . . . .	64
4.2.16 Debian Package Popularity Contest . . . . .	65
4.2.17 Selecting Packages for Installation . . . . .	66
4.2.18 Installing the GRUB Bootloader . . . . .	66
4.2.19 Finishing the Installation and Rebooting . . . . .	67
4.3 After the First Boot . . . . .	67
4.3.1 Installing Additional Software . . . . .	68

4.3.2 Upgrading the System . . . . .	69
<b>5. Packaging System: Tools and Fundamental Principles</b>	<b>71</b>
5.1 Structure of a Binary Package . . . . .	72
5.2 Package Meta-Information . . . . .	74
5.2.1 Description: the control File . . . . .	74
<i>Dependencies: the Depends Field</i> . . . . .	75
<i>Conflicts: the Conflicts field</i> . . . . .	77
<i>Incompatibilities: the Breaks Field</i> . . . . .	77
<i>Provided Items: the Provides Field</i> . . . . .	77
<i>Replacing Files: The Replaces Field</i> . . . . .	80
5.2.2 Configuration Scripts . . . . .	80
<i>Installation and Upgrade</i> . . . . .	81
<i>Package Removal</i> . . . . .	81
5.2.3 Checksums, List of Configuration Files . . . . .	83
5.3 Structure of a Source Package . . . . .	84
5.3.1 Format . . . . .	84
5.3.2 Usage within Debian . . . . .	87
5.4 Manipulating Packages with dpkg . . . . .	87
5.4.1 Installing Packages . . . . .	88
5.4.2 Package Removal . . . . .	89
5.4.3 Querying dpkg's Database and Inspecting .deb Files . . . . .	90
5.4.4 dpkg's Log File . . . . .	94
5.4.5 Multi-Arch Support . . . . .	94
<i>Enabling Multi-Arch</i> . . . . .	94
<i>Multi-Arch Related Changes</i> . . . . .	95
5.5 Coexistence with Other Packaging Systems . . . . .	96
<b>6. Maintenance and Updates: The APT Tools</b>	<b>99</b>
6.1 Filling in the sources.list File . . . . .	100
6.1.1 Syntax . . . . .	100
6.1.2 Repositories for <i>Stable</i> Users . . . . .	101
<i>Security Updates</i> . . . . .	102
<i>Stable Updates</i> . . . . .	103
<i>Proposed Updates</i> . . . . .	103
<i>Stable Backports</i> . . . . .	103
6.1.3 Repositories for <i>Testing/Unstable</i> Users . . . . .	104
<i>The Experimental Repository</i> . . . . .	105
6.1.4 Non-Official Resources: mentors.debian.net . . . . .	105
6.1.5 Caching Proxy for Debian Packages . . . . .	106
6.2 aptitude, apt-get, and apt Commands . . . . .	107
6.2.1 Initialization . . . . .	107
6.2.2 Installing and Removing . . . . .	107
6.2.3 System Upgrade . . . . .	109
6.2.4 Configuration Options . . . . .	111

6.2.5 Managing Package Priorities . . . . .	112
6.2.6 Working with Several Distributions . . . . .	114
6.2.7 Tracking Automatically Installed Packages . . . . .	115
6.3 The <code>apt-cache</code> Command . . . . .	116
6.4 Frontends: <code>aptitude</code> , <code>synaptic</code> . . . . .	117
6.4.1 <code>aptitude</code> . . . . .	117
<i>Managing Recommendations, Suggestions and Tasks</i> . . . . .	119
<i>Better Solver Algorithms</i> . . . . .	120
6.4.2 <code>synaptic</code> . . . . .	120
6.5 Checking Package Authenticity . . . . .	121
6.6 Upgrading from One Stable Distribution to the Next . . . . .	123
6.6.1 Recommended Procedure . . . . .	123
6.6.2 Handling Problems after an Upgrade . . . . .	124
6.7 Keeping a System Up to Date . . . . .	125
6.8 Automatic Upgrades . . . . .	127
6.8.1 Configuring <code>dpkg</code> . . . . .	127
6.8.2 Configuring APT . . . . .	127
6.8.3 Configuring <code>debconf</code> . . . . .	127
6.8.4 Handling Command Line Interactions . . . . .	127
6.8.5 The Miracle Combination . . . . .	128
6.9 Searching for Packages . . . . .	128
<b>7. Solving Problems and Finding Relevant Information</b> . . . . .	<b>133</b>
7.1 Documentation Sources . . . . .	134
7.1.1 Manual Pages . . . . .	134
7.1.2 <i>info</i> Documents . . . . .	136
7.1.3 Specific Documentation . . . . .	137
7.1.4 Websites . . . . .	137
7.1.5 Tutorials ( <i>HOWTO</i> ) . . . . .	138
7.2 Common Procedures . . . . .	139
7.2.1 Configuring a Program . . . . .	139
7.2.2 Monitoring What Daemons Are Doing . . . . .	140
7.2.3 Asking for Help on a Mailing List . . . . .	140
7.2.4 Reporting a Bug When a Problem Is Too Difficult . . . . .	141
<b>8. Basic Configuration: Network, Accounts, Printing...</b> . . . . .	<b>145</b>
8.1 Configuring the System for Another Language . . . . .	146
8.1.1 Setting the Default Language . . . . .	146
8.1.2 Configuring the Keyboard . . . . .	147
8.1.3 Migrating to UTF-8 . . . . .	148
8.2 Configuring the Network . . . . .	149
8.2.1 Ethernet Interface . . . . .	150
8.2.2 Connecting with PPP through a PSTN Modem . . . . .	151
8.2.3 Connecting through an ADSL Modem . . . . .	152
<i>Modems Supporting PPPOE</i> . . . . .	152

<i>Modems Supporting PPTP</i>	153
<i>Modems Supporting DHCP</i>	153
8.2.4 Automatic Network Configuration for Roaming Users	153
8.3 Setting the Hostname and Configuring the Name Service	154
8.3.1 Name Resolution	155
<i>Configuring DNS Servers</i>	155
<i>The /etc/hosts file</i>	156
8.4 User and Group Databases	156
8.4.1 User List: /etc/passwd	157
8.4.2 The Hidden and Encrypted Password File: /etc/shadow	157
8.4.3 Modifying an Existing Account or Password	158
8.4.4 Disabling an Account	158
8.4.5 Group List: /etc/group	158
8.5 Creating Accounts	159
8.6 Shell Environment	160
8.7 Printer Configuration	162
8.8 Configuring the Bootloader	162
8.8.1 Identifying the Disks	163
8.8.2 Configuring LILO	165
8.8.3 GRUB 2 Configuration	166
8.8.4 For Macintosh Computers (PowerPC): Configuring Yaboot	167
8.9 Other Configurations: Time Synchronization, Logs, Sharing Access...	168
8.9.1 Timezone	168
8.9.2 Time Synchronization	169
<i>For Workstations</i>	170
<i>For Servers</i>	170
8.9.3 Rotating Log Files	170
8.9.4 Sharing Administrator Rights	171
8.9.5 List of Mount Points	171
8.9.6 locate and updatedb	173
8.10 Compiling a Kernel	173
8.10.1 Introduction and Prerequisites	174
8.10.2 Getting the Sources	174
8.10.3 Configuring the Kernel	175
8.10.4 Compiling and Building the Package	176
8.10.5 Compiling External Modules	177
8.10.6 Applying a Kernel Patch	178
8.11 Installing a Kernel	179
8.11.1 Features of a Debian Kernel Package	179
8.11.2 Installing with dpkg	179

## 9. Unix Services 181

9.1 System Boot	182
9.1.1 The systemd init system	182

9.1.2 The System V init system . . . . .	188
9.2 Remote Login . . . . .	191
9.2.1 Secure Remote Login: SSH . . . . .	191
<i>Key-Based Authentication</i> . . . . .	192
<i>Using Remote X11 Applications</i> . . . . .	194
<i>Creating Encrypted Tunnels with Port Forwarding</i> . . . . .	194
9.2.2 Using Remote Graphical Desktops . . . . .	195
9.3 Managing Rights . . . . .	197
9.4 Administration Interfaces . . . . .	199
9.4.1 Administrating on a Web Interface: webmin . . . . .	199
9.4.2 Configuring Packages: debconf . . . . .	201
9.5 syslog System Events . . . . .	201
9.5.1 Principle and Mechanism . . . . .	201
9.5.2 The Configuration File . . . . .	202
<i>Syntax of the Selector</i> . . . . .	202
<i>Syntax of Actions</i> . . . . .	203
9.6 The inetd Super-Server . . . . .	204
9.7 Scheduling Tasks with cron and atd . . . . .	205
9.7.1 Format of a crontab File . . . . .	206
9.7.2 Using the at Command . . . . .	207
9.8 Scheduling Asynchronous Tasks: anacron . . . . .	208
9.9 Quotas . . . . .	209
9.10 Backup . . . . .	210
9.10.1 Backing Up with rsync . . . . .	211
9.10.2 Restoring Machines without Backups . . . . .	213
9.11 Hot Plugging: <i>hotplug</i> . . . . .	213
9.11.1 Introduction . . . . .	213
9.11.2 The Naming Problem . . . . .	214
9.11.3 How <i>udev</i> Works . . . . .	215
9.11.4 A concrete example . . . . .	216
9.12 Power Management: Advanced Configuration and Power Interface (ACPI) . . . . .	218

## 10. Network Infrastructure 221

10.1 Gateway . . . . .	222
10.2 Virtual Private Network . . . . .	224
10.2.1 OpenVPN . . . . .	224
<i>Public Key Infrastructure: easy-rsa</i> . . . . .	224
<i>Configuring the OpenVPN Server</i> . . . . .	228
<i>Configuring the OpenVPN Client</i> . . . . .	229
10.2.2 Virtual Private Network with SSH . . . . .	229
10.2.3 IPsec . . . . .	230
10.2.4 PPTP . . . . .	231
<i>Configuring the Client</i> . . . . .	231
<i>Configuring the Server</i> . . . . .	232

10.3 Quality of Service . . . . .	235
10.3.1 Principle and Mechanism . . . . .	235
10.3.2 Configuring and Implementing . . . . .	235
<i>Reducing Latencies: wondershaper</i> . . . . .	235
<i>Standard Configuration</i> . . . . .	236
10.4 Dynamic Routing . . . . .	236
10.5 IPv6 . . . . .	237
10.5.1 Tunneling . . . . .	239
10.6 Domain Name Servers (DNS) . . . . .	240
10.6.1 Principle and Mechanism . . . . .	240
10.6.2 Configuring . . . . .	241
10.7 DHCP . . . . .	243
10.7.1 Configuring . . . . .	243
10.7.2 DHCP and DNS . . . . .	244
10.8 Network Diagnosis Tools . . . . .	245
10.8.1 Local Diagnosis: netstat . . . . .	245
10.8.2 Remote Diagnosis: nmap . . . . .	246
10.8.3 Sniffers: tcpdump and wireshark . . . . .	248

## 11. Network Services: Postfix, Apache, NFS, Samba, Squid, LDAP, SIP, XMPP, TURN 251

11.1 Mail Server . . . . .	252
11.1.1 Installing Postfix . . . . .	252
11.1.2 Configuring Virtual Domains . . . . .	255
<i>Virtual Alias Domains</i> . . . . .	255
<i>Virtual Mailbox Domains</i> . . . . .	256
11.1.3 Restrictions for Receiving and Sending . . . . .	257
<i>IP-Based Access Restrictions</i> . . . . .	258
<i>Checking the Validity of the EHLO or HELO Commands</i> . . . . .	259
<i>Accepting or Refusing Based on the Announced Sender</i> . . . . .	260
<i>Accepting or Refusing Based on the Recipient</i> . . . . .	260
<i>Restrictions Associated with the DATA Command</i> . . . . .	261
<i>Applying Restrictions</i> . . . . .	261
<i>Filtering Based on the Message Contents</i> . . . . .	261
11.1.4 Setting Up <i>greylisting</i> . . . . .	262
11.1.5 Customizing Filters Based On the Recipient . . . . .	264
11.1.6 Integrating an Antivirus . . . . .	265
11.1.7 Authenticated SMTP . . . . .	266
11.2 Web Server (HTTP) . . . . .	268
11.2.1 Installing Apache . . . . .	268
11.2.2 Configuring Virtual Hosts . . . . .	269
11.2.3 Common Directives . . . . .	271
<i>Requiring Authentication</i> . . . . .	272
<i>Restricting Access</i> . . . . .	272

11.2.4 Log Analyzers . . . . .	273
11.3 FTP File Server . . . . .	275
11.4 NFS File Server . . . . .	276
11.4.1 Securing NFS . . . . .	277
11.4.2 NFS Server . . . . .	277
11.4.3 NFS Client . . . . .	278
11.5 Setting Up Windows Shares with Samba . . . . .	279
11.5.1 Samba Server . . . . .	279
<i>Configuring with debconf</i> . . . . .	279
<i>Configuring Manually</i> . . . . .	280
11.5.2 Samba Client . . . . .	281
<i>The smbclient Program</i> . . . . .	281
<i>Mounting Windows Shares</i> . . . . .	281
<i>Printing on a Shared Printer</i> . . . . .	282
11.6 HTTP/FTP Proxy . . . . .	282
11.6.1 Installing . . . . .	282
11.6.2 Configuring a Cache . . . . .	283
11.6.3 Configuring a Filter . . . . .	283
11.7 LDAP Directory . . . . .	284
11.7.1 Installing . . . . .	284
11.7.2 Filling in the Directory . . . . .	286
11.7.3 Managing Accounts with LDAP . . . . .	287
<i>Configuring NSS</i> . . . . .	287
<i>Configuring PAM</i> . . . . .	288
<i>Securing LDAP Data Exchanges</i> . . . . .	289
11.8 Real-Time Communication Services . . . . .	292
11.8.1 DNS settings for RTC services . . . . .	293
11.8.2 TURN Server . . . . .	293
<i>Install the TURN server</i> . . . . .	294
<i>Managing the TURN users</i> . . . . .	294
11.8.3 SIP Proxy Server . . . . .	294
<i>Install the SIP proxy</i> . . . . .	295
<i>Managing the SIP proxy</i> . . . . .	296
11.8.4 XMPP Server . . . . .	296
<i>Install the XMPP server</i> . . . . .	297
<i>Managing the XMPP server</i> . . . . .	297
11.8.5 Running services on port 443 . . . . .	297
11.8.6 Adding WebRTC . . . . .	298

## 12. Advanced Administration 301

12.1 RAID and LVM . . . . .	302
12.1.1 Software RAID . . . . .	302
<i>Different RAID Levels</i> . . . . .	303
<i>Setting up RAID</i> . . . . .	305



<i>Backing up the Configuration</i> . . . . .	311
12.1.2 LVM . . . . .	312
<i>LVM Concepts</i> . . . . .	313
<i>Setting up LVM</i> . . . . .	313
<i>LVM Over Time</i> . . . . .	318
12.1.3 RAID or LVM? . . . . .	320
12.2 Virtualization . . . . .	323
12.2.1 Xen . . . . .	323
12.2.2 LXC . . . . .	329
<i>Preliminary Steps</i> . . . . .	330
<i>Network Configuration</i> . . . . .	330
<i>Setting Up the System</i> . . . . .	331
<i>Starting the Container</i> . . . . .	332
12.2.3 Virtualization with KVM . . . . .	334
<i>Preliminary Steps</i> . . . . .	334
<i>Network Configuration</i> . . . . .	335
<i>Installation with virt-install</i> . . . . .	335
<i>Managing Machines with virsh</i> . . . . .	337
<i>Installing an RPM based system in Debian with yum</i> . . . . .	338
12.3 Automated Installation . . . . .	339
12.3.1 Fully Automatic Installer (FAI) . . . . .	339
12.3.2 Preseeding Debian-Installer . . . . .	340
<i>Using a Preseed File</i> . . . . .	341
<i>Creating a Preseed File</i> . . . . .	341
<i>Creating a Customized Boot Media</i> . . . . .	342
12.3.3 Simple-CDD: The All-In-One Solution . . . . .	343
<i>Creating Profiles</i> . . . . .	344
<i>Configuring and Using build-simple-cdd</i> . . . . .	344
<i>Generating an ISO Image</i> . . . . .	345
12.4 Monitoring . . . . .	345
12.4.1 Setting Up Munin . . . . .	346
<i>Configuring Hosts To Monitor</i> . . . . .	346
<i>Configuring the Grapher</i> . . . . .	347
12.4.2 Setting Up Nagios . . . . .	348
<i>Installing</i> . . . . .	348
<i>Configuring</i> . . . . .	349
<b>13. Workstation</b> . . . . .	<b>355</b>
13.1 Configuring the X11 Server . . . . .	356
13.2 Customizing the Graphical Interface . . . . .	357
13.2.1 Choosing a Display Manager . . . . .	357
13.2.2 Choosing a Window Manager . . . . .	358
13.2.3 Menu Management . . . . .	359
13.3 Graphical Desktops . . . . .	359

13.3.1	GNOME	359
13.3.2	KDE	360
13.3.3	Xfce and Others	361
13.4	Email	362
13.4.1	Evolution	362
13.4.2	KMail	363
13.4.3	Thunderbird and Icedove	364
13.5	Web Browsers	365
13.6	Development	366
13.6.1	Tools for GTK+ on GNOME	366
13.6.2	Tools for Qt on KDE	367
13.7	Collaborative Work	367
13.7.1	Working in Groups: <i>groupware</i>	367
13.7.2	Collaborative Work With FusionForge	367
13.8	Office Suites	368
13.9	Emulating Windows: Wine	369
13.10	Real-Time Communications software	370
<b>14.</b>	<b>Security</b>	<b>375</b>
14.1	Defining a Security Policy	376
14.2	Firewall or Packet Filtering	377
14.2.1	Netfilter Behavior	378
14.2.2	Syntax of iptables and ip6tables	380
	<i>Commands</i>	380
	<i>Rules</i>	381
14.2.3	Creating Rules	381
14.2.4	Installing the Rules at Each Boot	383
14.3	Supervision: Prevention, Detection, Deterrence	383
14.3.1	Monitoring Logs with logcheck	383
14.3.2	Monitoring Activity	384
	<i>In Real Time</i>	384
	<i>History</i>	385
14.3.3	Detecting Changes	385
	<i>Auditing Packages with dpkg --verify</i>	386
	<i>Auditing Packages: debsums and its Limits</i>	387
	<i>Monitoring Files: AIDE</i>	387
14.3.4	Detecting Intrusion (IDS/NIDS)	388
14.4	Introduction to AppArmor	389
14.4.1	Principles	389
14.4.2	Enabling AppArmor and managing AppArmor profiles	390
14.4.3	Creating a new profile	391
14.5	Introduction to SELinux	397
14.5.1	Principles	397
14.5.2	Setting Up SELinux	399

14.5.3 Managing an SELinux System . . . . .	400
<i>Managing SELinux Modules</i> . . . . .	401
<i>Managing Identities</i> . . . . .	401
<i>Managing File Contexts, Ports and Booleans</i> . . . . .	402
14.5.4 Adapting the Rules . . . . .	403
<i>Writing a .fc file</i> . . . . .	403
<i>Writing a .if File</i> . . . . .	404
<i>Writing a .te File</i> . . . . .	405
<i>Compiling the Files</i> . . . . .	409
14.6 Other Security-Related Considerations . . . . .	409
14.6.1 Inherent Risks of Web Applications . . . . .	409
14.6.2 Knowing What To Expect . . . . .	409
14.6.3 Choosing the Software Wisely . . . . .	411
14.6.4 Managing a Machine as a Whole . . . . .	411
14.6.5 Users Are Players . . . . .	412
14.6.6 Physical Security . . . . .	412
14.6.7 Legal Liability . . . . .	413
14.7 Dealing with a Compromised Machine . . . . .	413
14.7.1 Detecting and Seeing the Cracker's Intrusion . . . . .	413
14.7.2 Putting the Server Off-Line . . . . .	414
14.7.3 Keeping Everything that Could Be Used as Evidence . . . . .	414
14.7.4 Re-installing . . . . .	415
14.7.5 Forensic Analysis . . . . .	415
14.7.6 Reconstituting the Attack Scenario . . . . .	416
<b>15. Creating a Debian Package</b> . . . . .	419
15.1 Rebuilding a Package from its Sources . . . . .	420
15.1.1 Getting the Sources . . . . .	420
15.1.2 Making Changes . . . . .	420
15.1.3 Starting the Rebuild . . . . .	421
15.2 Building your First Package . . . . .	423
15.2.1 Meta-Packages or Fake Packages . . . . .	423
15.2.2 Simple File Archive . . . . .	424
15.3 Creating a Package Repository for APT . . . . .	427
15.4 Becoming a Package Maintainer . . . . .	430
15.4.1 Learning to Make Packages . . . . .	430
<i>Rules</i> . . . . .	430
<i>Procedures</i> . . . . .	430
<i>Tools</i> . . . . .	430
15.4.2 Acceptance Process . . . . .	432
<i>Prerequisites</i> . . . . .	432
<i>Registration</i> . . . . .	432
<i>Accepting the Principles</i> . . . . .	433
<i>Checking Skills</i> . . . . .	433

## 16. Conclusion: Debian's Future 437

16.1 Upcoming Developments . . . . .	438
16.2 Debian's Future . . . . .	438
16.3 Future of this Book . . . . .	439

## A. Derivative Distributions 441

A.1 Census and Cooperation . . . . .	441
A.2 Ubuntu . . . . .	441
A.3 Linux Mint . . . . .	442
A.4 Knoppix . . . . .	443
A.5 Aptosid and Siduction . . . . .	443
A.6 Grml . . . . .	443
A.7 Tails . . . . .	444
A.8 Kali Linux . . . . .	444
A.9 Devuan . . . . .	444
A.10 Tanglu . . . . .	444
A.11 DoudouLinux . . . . .	445
A.12 Raspbian . . . . .	445
A.13 And Many More . . . . .	445

## B. Short Remedial Course 447

B.1 Shell and Basic Commands . . . . .	447
B.1.1 Browsing the Directory Tree and Managing Files . . . . .	447
B.1.2 Displaying and Modifying Text Files . . . . .	448
B.1.3 Searching for Files and within Files . . . . .	449
B.1.4 Managing Processes . . . . .	449
B.1.5 System Information: Memory, Disk Space, Identity . . . . .	449
B.2 Organization of the Filesystem Hierarchy . . . . .	450
B.2.1 The Root Directory . . . . .	450
B.2.2 The User's Home Directory . . . . .	451
B.3 Inner Workings of a Computer: the Different Layers Involved . . . . .	452
B.3.1 The Deepest Layer: the Hardware . . . . .	452
B.3.2 The Starter: the BIOS or UEFI . . . . .	453
B.3.3 The Kernel . . . . .	454
B.3.4 The User Space . . . . .	454
B.4 Some Tasks Handled by the Kernel . . . . .	454
B.4.1 Driving the Hardware . . . . .	454
B.4.2 Filesystems . . . . .	455
B.4.3 Shared Functions . . . . .	456
B.4.4 Managing Processes . . . . .	456
B.4.5 Rights Management . . . . .	457
B.5 The User Space . . . . .	457
B.5.1 Process . . . . .	458

B.5.2 Daemons . . . . . 458

B.5.3 Inter-Process Communications . . . . . 459

B.5.4 Libraries . . . . . 460

**Index** . . . . . 461