

Linux Networking

Paul Cobbaut

Linux Networking

Paul Cobbaut

Paul Cobbaut

Publication date 2015-05-24 CEST

Abstract

This book is meant to be used in an instructor-led training. For self-study, the intent is to read this book next to a working Linux computer so you can immediately do every subject, practicing each command.

This book is aimed at novice Linux system administrators (and might be interesting and useful for home users that want to know a bit more about their Linux system). However, this book is not meant as an introduction to Linux desktop applications like text editors, browsers, mail clients, multimedia or office applications.

More information and free .pdf available at <http://linux-training.be> .

Feel free to contact the author:

- Paul Cobbaut: paul.cobbaut@gmail.com, <http://www.linkedin.com/in/cobbaut>

Contributors to the Linux Training project are:

- Serge van Ginderachter: serge@ginsys.be, build scripts; infrastructure setup; minor stuff
- Hendrik De Vloed: hendrik.devloed@ugent.be, buildheader.pl script

We'd also like to thank our reviewers:

- Wouter Verhelst: wouter@grep.be, <http://grep.be>
- Geert Goossens: mail.goossens.geert@gmail.com, <http://www.linkedin.com/in/geertgoossens>
- Elie De Brauer: elie@de-brauer.be, <http://www.de-brauer.be>
- Christophe Vandeplas: christophe@vandeplas.com, <http://christophe.vandeplas.com>
- Bert Desmet: bert@devnox.be, <http://bdesmet.be>
- Rich Yonts: richyonts@gmail.com,

Copyright 2007-2015 Paul Cobbaut

Permission is granted to copy, distribute and/or modify this document under the terms of the **GNU Free Documentation License**, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled 'GNU Free Documentation License'.

Table of Contents

I. network management	1
1. general networking	4
1.1. network layers	5
1.2. unicast, multicast, broadcast, anycast	8
1.3. lan-wan-man	10
1.4. internet - intranet - extranet	12
1.5. tcp/ip	13
2. interface configuration	14
2.1. to gui or not to gui	15
2.2. Debian nic configuration	16
2.3. RHEL nic configuration	18
2.4. ifconfig	20
2.5. ip	22
2.6. dhclient	23
2.7. hostname	23
2.8. arp	24
2.9. route	25
2.10. ping	25
2.11. optional: ethtool	26
2.12. practice: interface configuration	27
2.13. solution: interface configuration	28
3. network sniffing	30
3.1. wireshark	31
3.2. tcpdump	35
3.3. practice: network sniffing	36
3.4. solution: network sniffing	37
4. binding and bonding	38
4.1. binding on Redhat/Fedora	39
4.2. binding on Debian/Ubuntu	40
4.3. bonding on Redhat/Fedora	41
4.4. bonding on Debian/Ubuntu	43
4.5. practice: binding and bonding	45
4.6. solution: binding and bonding	46
5. ssh client and server	47
5.1. about ssh	48
5.2. log on to a remote server	50
5.3. executing a command in remote	50
5.4. scp	51
5.5. setting up passwordless ssh	52
5.6. X forwarding via ssh	53
5.7. troubleshooting ssh	54
5.8. sshd	55
5.9. sshd keys	55
5.10. ssh-agent	55
5.11. practice: ssh	56
5.12. solution: ssh	57
6. introduction to nfs	59
6.1. nfs protocol versions	60
6.2. rpcinfo	60
6.3. server configuration	61
6.4. /etc/exports	61
6.5. exportfs	61
6.6. client configuration	62
6.7. practice: introduction to nfs	63
7. introduction to networking	64

7.1. introduction to iptables	65
7.2. practice : iptables	66
7.3. solution : iptables	67
7.4. xinetd and inetd	68
7.5. practice : inetd and xinetd	70
7.6. network file system	71
7.7. practice : network file system	73
II. apache and squid	74
8. apache web server	76
8.1. introduction to apache	77
8.2. port virtual hosts on Debian	84
8.3. named virtual hosts on Debian	88
8.4. password protected website on Debian	90
8.5. port virtual hosts on CentOS	91
8.6. named virtual hosts on CentOS	95
8.7. password protected website on CentOS	97
8.8. troubleshooting apache	99
8.9. virtual hosts example	100
8.10. aliases and redirects	100
8.11. more on .htaccess	100
8.12. traffic	100
8.13. self signed cert on Debian	101
8.14. self signed cert on RHEL/CentOS	103
8.15. practice: apache	105
9. introduction to squid	106
9.1. about proxy servers	106
9.2. installing squid	107
9.3. port 3128	107
9.4. starting and stopping	107
9.5. client proxy settings	108
9.6. upside down images	110
9.7. /var/log/squid	112
9.8. access control	112
9.9. testing squid	112
9.10. name resolution	112
III. dns server	114
10. introduction to DNS	116
10.1. about dns	117
10.2. dns namespace	120
10.3. caching only servers	125
10.4. authoritative dns servers	128
10.5. primary and secondary	128
10.6. zone transfers	128
10.7. master and slave	130
10.8. SOA record	130
10.9. full or incremental zone transfers	131
10.10. DNS cache	132
10.11. forward lookup zone example	133
10.12. example: caching only DNS server	134
10.13. example: caching only with forwarder	136
10.14. example: primary authoritative server	138
10.15. example: a DNS slave server	142
10.16. practice: dns	144
10.17. solution: dns	145
11. advanced DNS	146
11.1. example: DNS round robin	147
11.2. DNS delegation	148
11.3. example: DNS delegation	149

11.4. example: split-horizon dns	151
11.5. old dns topics	153
IV. dhcp server	157
12. introduction to dhcp	159
12.1. four broadcasts	160
12.2. picturing dhcp	161
12.3. installing a dhcp server	162
12.4. dhcp server for RHEL/CentOS	162
12.5. client reservations	163
12.6. example config files	163
12.7. older example config files	164
12.8. advanced dhcp	166
12.9. Practice: dhcp	167
V. iptables firewall	168
13. introduction to routers	170
13.1. router or firewall	171
13.2. packet forwarding	171
13.3. packet filtering	171
13.4. stateful	171
13.5. nat (network address translation)	172
13.6. pat (port address translation)	172
13.7. snat (source nat)	172
13.8. masquerading	172
13.9. dnat (destination nat)	172
13.10. port forwarding	172
13.11. /proc/sys/net/ipv4/ip_forward	173
13.12. /etc/sysctl.conf	173
13.13. sysctl	173
13.14. practice: packet forwarding	174
13.15. solution: packet forwarding	176
14. iptables firewall	179
14.1. iptables tables	180
14.2. starting and stopping iptables	180
14.3. the filter table	181
14.4. practice: packet filtering	186
14.5. solution: packet filtering	187
14.6. network address translation	188
VI. Introduction to Samba	191
15. introduction to samba	194
15.1. verify installed version	195
15.2. installing samba	196
15.3. documentation	197
15.4. starting and stopping samba	198
15.5. samba daemons	199
15.6. the SMB protocol	200
15.7. practice: introduction to samba	201
16. getting started with samba	202
16.1. /etc/samba/smb.conf	203
16.2. /usr/bin/testparm	204
16.3. /usr/bin/smbclient	205
16.4. /usr/bin/smbtree	207
16.5. server string	208
16.6. Samba Web Administration Tool (SWAT)	209
16.7. practice: getting started with samba	210
16.8. solution: getting started with samba	211
17. a read only file server	213
17.1. Setting up a directory to share	214
17.2. configure the share	214

[Click here to download full PDF material](#)