Contents

Preface **vii**

1 The Domain Name System (DNS) **1**
1.1 DNS Fundamentals 1
1.2 Domains and Domain Names 1
1.3 Zones 2
1.4 Authoritative Name Servers 2
1.5 Caching Name Servers 3
1.6 Name Servers in Multiple Roles 4

2 BIND Resource Requirements **5**
2.1 Hardware requirements 5
2.2 CPU Requirements 5
2.3 Memory Requirements 5
2.4 Name Server Intensive Environment Issues 6

3 Installation **7**
3.1 Supported Operating Systems 7
3.2 Build and Install from Source 8
3.3 Installation using Pre-built Packages 11
3.4 Locations of Files 13

4 Name Server Operations **15**
4.1 named 15
4.2 Signals 17
4.3 rndc 17
4.4 rndc configuration 21
4.5 rndc-confgen 23

5 Administrative Tools **25**
5.1 named-checkconf 25
5.2 named-checkzone 26
5.3 named-compilezone 29
5.4 nsupdate 29
5.5 dnssec-keygen 33
5.6 dnssec-signzone 35

6 Diagnostic Tools **41**
6.1 dig . . . 41
6.2 host . . . 49
6.3 nslookup . . . 51

7 Advanced DNS Features **55**
7.1 Notify . . . 55
7.2 Dynamic Update . . . 55
7.3 The journal file . . . 55
7.4 Incremental Zone Transfers (IXFR) . . . 56
7.5 Split DNS . . . 57
7.6 TSIG . . . 61
7.7 TKEY . . . 64
7.8 SIG(0) . . . 64
7.9 DNSSEC . . . 65
7.10 IPv6 Support in BIND 9 . . . 68

8 The BIND 9 Lightweight Resolver **71**
8.1 The Lightweight Resolver Library . . . 71
8.2 Running a Resolver Daemon . . . 71
8.3 Using lwresd . . . 72

9 Name Server Configuration **75**
9.1 Configuration File Elements . . . 75
9.2 Address Match Lists . . . 77
9.3 Comment Syntax . . . 78
9.4 Configuration File Grammar . . . 79
9.5 Sample Configurations . . . 80

10 BIND 9 Configuration Reference **83**
10.1 acl Statement . . . 83
10.2 controls Statement . . . 83
10.3 include Statement . . . 85
10.4 key Statement . . . 85
10.5 logging Statement . . . 86
10.6 lwres Statement . . . 92
10.7 masters Statement . . . 93
10.8 options Statement . . . 94
10.9 Forwarding . . . 108
10.10 Dual-stack Servers . . . 109
10.11 Access Control . . . 109
10.12 Interfaces . . . 111
10.13 Zone Transfers . . . 113
10.14 Bad UDP Port Lists . . . 116
10.15 Operating System Resource Limits . . . 116
10.16 Server Resource Limits . . . 117

10.17 Periodic Task Intervals . . . 118
10.18 Topology . . . 119
10.19 The sortlist Statement . . . 119
10.20 RRset Ordering . . . 121
10.21 Tuning . . . 122
10.22 Built-in server information zones . . . 124
10.23 Built-in Empty Zones . . . 125
10.24 The Statistics File . . . 127
10.25 Additional Section Caching . . . 128
10.26 server Statement . . . 130
10.27 trusted-keys Statement . . . 132
10.28 view Statement . . . 133
10.29 zone Statement . . . 134
10.30 Dynamic Update Policies . . . 144

11 Zone Files **147**
11.1 Using Resource Records . . . 147
11.2 Load Balancing . . . 153
11.3 Other Zone File Directives . . . 153
11.4 Additional File Formats . . . 156

12 BIND 9 Security Considerations **157**
12.1 Access Control Lists . . . 157
12.2 Preventing Denial of Service (DoS) attacks . . . 158
12.3 Limiting Version Number Availability . . . 165
12.4 Controlling Log Messages . . . 166
12.5 Controlling Visibility of DNS Servers . . . 167
12.6 Chroot and Setuid . . . 168
12.7 Dynamic Update Security . . . 169

13 Troubleshooting **171**
13.1 How can I figure out what's wrong? . . . 171
13.2 Where Can I Get Help? . . . 171

A A Brief History of the DNS and BIND **173**

B BIND 8 to BIND 9 Migration Notes **175**
B.1 Configuration File Compatibility . . . 175
B.2 Zone File Compatibility . . . 176
B.3 Interoperability Impact of New Protocol Features . . . 178
B.4 Unrestricted Character Set . . . 178
B.5 Server Administration Tools . . . 179
B.6 No Information Leakage Between Zones . . . 180
B.7 Umask Not Modified . . . 181

C Request for Comments (RFCs) **183**

D Example caching-only name server configuration **189**

Index **191**