

NETWORKING

# Computer Networking from LANs to WANs: Hardware, Software, and Security

Kenneth C. Mansfield Jr.  
James L. Antonakos





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**James L. Antonakos**

 **COURSE TECHNOLOGY**  
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Security**

**Kenneth C. Mansfield, Jr. and  
James L. Antonakos**

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*To our readers, who make everything possible.*



# Brief Table of Contents

PREFACE .....	xxiii
CHAPTER 1	
<b>What Is a Computer Network?</b> .....	1
CHAPTER 2	
<b>Network Topology</b> .....	21
CHAPTER 3	
<b>Networking Hardware</b> .....	39
CHAPTER 4	
<b>Ethernet Technology</b> .....	77
CHAPTER 5	
<b>Token-Ring, FDDI, and Other LAN Technologies</b> .....	117
CHAPTER 6	
<b>Network Design and Troubleshooting Scenarios</b> .....	137
CHAPTER 7	
<b>Low-Level Protocols</b> .....	169
CHAPTER 8	
<b>The TCP/IP Protocols</b> .....	191
CHAPTER 9	
<b>IPX/SPX, AppleTalk, and Other Network Protocols</b> .....	251
CHAPTER 10	
<b>Switching and Routing</b> .....	277
CHAPTER 11	
<b>Network Management and Security</b> .....	329
CHAPTER 12	
<b>Electronic Mail</b> .....	389
CHAPTER 13	
<b>FTP and Telnet</b> .....	421
CHAPTER 14	
<b>Multimedia Networking</b> .....	489
CHAPTER 15	
<b>The Internet</b> .....	525
CHAPTER 16	
<b>Writing a Network Application</b> .....	575
CHAPTER 17	
<b>An Introduction to Networking with Windows</b> .....	613
CHAPTER 18	
<b>Windows Domains</b> .....	643
CHAPTER 19	
<b>UNIX and Linux</b> .....	695
CHAPTER 20	
<b>Other Network Operating Systems</b> .....	737

v

CHAPTER 21	
<b>Cryptography and Security</b> . . . . .	<b>775</b>
CHAPTER 22	
<b>Security Hardware</b> . . . . .	<b>805</b>
CHAPTER 23	
<b>Security Software</b> . . . . .	<b>835</b>
CHAPTER 24	
<b>Forensic Techniques</b> . . . . .	<b>861</b>
GLOSSARY . . . . .	<b>913</b>
INDEX . . . . .	<b>929</b>

# Table of Contents

PREFACE .....	xxiii
PART 1	
<b>Network Hardware</b>	
CHAPTER 1	
<b>What Is a Computer Network? .....</b>	<b>1</b>
Computer Network Topology .....	2
Wired Networks Versus Wireless Networks .....	3
Representing Digital Data .....	4
Working with Digital Data .....	5
Communication Protocols .....	5
The Physical Layer .....	6
The Data-Link Layer .....	6
The Network Layer .....	6
The Transport Layer .....	6
The Session Layer .....	6
The Presentation Layer .....	6
The Application Layer .....	7
Ethernet LANs .....	7
Token-Ring LANs .....	9
Network Operating Systems .....	9
IEEE 802 Standards .....	11
Troubleshooting Techniques .....	11
Chapter Summary .....	12
Key Terms .....	13
Review Questions .....	14
Hands-On Projects .....	16
Case Projects .....	18
CHAPTER 2	
<b>Network Topology .....</b>	<b>21</b>
Physical Topology Versus Logical Topology .....	22
Fully Connected Networks .....	24
Star Networks .....	25
Bus Networks .....	26
Ring Networks .....	26
Hybrid Networks .....	27
Network Hierarchy .....	28
Subnets .....	29
Network Access Points .....	29
Public Networks Versus Private Networks .....	30
Troubleshooting Techniques .....	31
	<b>vii</b>



Chapter Summary . . . . .	32
Key Terms . . . . .	32
Review Questions . . . . .	33
Hands-On Projects . . . . .	35
Case Projects . . . . .	38
CHAPTER 3	
<b>Networking Hardware . . . . .</b>	<b>39</b>
Ethernet Cabling . . . . .	40
The NIC . . . . .	46
Token-Ring . . . . .	52
Repeaters . . . . .	53
Transceivers . . . . .	54
Hubs . . . . .	55
Bridges/Switches . . . . .	56
Routers and Firewalls . . . . .	58
Cable Modems . . . . .	61
Satellite Network System . . . . .	63
Exotic Hardware and Software . . . . .	64
Troubleshooting Techniques . . . . .	67
Chapter Summary . . . . .	69
Key Terms . . . . .	70
Review Questions . . . . .	70
Hands-On Projects . . . . .	72
Case Projects . . . . .	74
CHAPTER 4	
<b>Ethernet Technology . . . . .</b>	<b>77</b>
The Ethernet Frame Format . . . . .	78
Preamble (7 bytes) . . . . .	79
SFD (1 byte) . . . . .	79
Destination Address (6 bytes) . . . . .	79
Source Address (6 bytes) . . . . .	79
Length (2 bytes) . . . . .	80
Data (46 to 1500 bytes) . . . . .	80
FCS (4 bytes) . . . . .	80
Interframe Gap . . . . .	80
CSMA/CD . . . . .	82
No Collision During Frame . . . . .	82
A Collision Occurs During the Frame . . . . .	83
Detecting Errors . . . . .	85
Jam Sequence . . . . .	86
Random Waiting Period . . . . .	86
Ethernet Controllers . . . . .	86
10-Mbps Ethernet . . . . .	87
10base5 . . . . .	89

10base2	89
10baseT	89
10baseF	92
10baseFL	92
10baseFB	92
10baseFP	92
<b>100-Mbps Ethernet (Fast Ethernet)</b>	<b>93</b>
100baseT4	94
100baseTX	96
100baseFX	96
100baseT2	98
Fast Link Pulses	98
Two Repeater Types	101
100VG-AnyLAN	101
<b>1000-Mbps Ethernet (Gigabit Ethernet)</b>	<b>102</b>
Carrier Extension	102
Frame Bursting	103
Single Repeater Type	103
Gigabit Ethernet Architecture	103
1000baseT	103
1000baseCX	104
1000baseSX	105
1000baseLX	105
<b>10 Gigabit Ethernet</b>	<b>106</b>
<b>Wireless Ethernet</b>	<b>107</b>
Types of Wireless LANs	108
<b>Troubleshooting Techniques</b>	<b>109</b>
MTU Affects Available Bandwidth	109
Jabber	109
Runts	110
Alignment Error	110
Cabling	110
Lost Termination	110
Excess Utilization	111
<b>Chapter Summary</b>	<b>111</b>
<b>Key Terms</b>	<b>111</b>
<b>Review Questions</b>	<b>112</b>
<b>Hands-On Projects</b>	<b>114</b>
<b>Case Projects</b>	<b>116</b>

## CHAPTER 5

<b>Token-Ring, FDDI, and Other LAN Technologies</b>	<b>117</b>
Token-Ring	118
Token-Ring Topology	119
Token-Ring Frame Formats	120
Ring Management	121
Comparing Token-Ring and Ethernet	122
Token-Bus	123
FDDI	123
Broadband LANs	125

ARCnet . . . . .	126
Bluetooth . . . . .	126
Troubleshooting Techniques . . . . .	128
Network Troubleshooting Example . . . . .	129
Chapter Summary . . . . .	130
Key Terms . . . . .	131
Review Questions . . . . .	132
Hands-On Projects . . . . .	134
Case Projects . . . . .	135
CHAPTER 6	
<b>Network Design and Troubleshooting Scenarios . . . . .</b>	<b>137</b>
Networking Two Computers . . . . .	138
Networking a Small Lab . . . . .	140
Networking a Small Business . . . . .	142
Networking a College Campus . . . . .	145
Remote Access Methods . . . . .	147
Troubleshooting Techniques . . . . .	149
Monitor Network Baseline Utilization . . . . .	150
Checking the Hardware . . . . .	150
Using Test Equipment . . . . .	150
What's My IP? . . . . .	150
Check the Network Neighborhood . . . . .	152
Can You PING? . . . . .	152
Baseband Versus Broadband . . . . .	152
Chapter Summary . . . . .	153
Key Terms . . . . .	153
Review Questions . . . . .	154
Hands-On Projects . . . . .	156
Case Projects . . . . .	160
PART 2	
<b>Network Protocols</b>	
CHAPTER 7	
<b>Low-Level Protocols . . . . .</b>	<b>169</b>
Serial Data Communication . . . . .	170
SLIP . . . . .	171
PPP . . . . .	172
PPPoE . . . . .	173
Logical Link Control . . . . .	173
NetBIOS . . . . .	174
NetBEUI . . . . .	177
Troubleshooting Techniques . . . . .	181
Remote Access Trouble . . . . .	181

Chapter Summary .....	182
Key Terms.....	183
Review Questions.....	184
Hands-On Projects.....	186
Case Projects.....	187
 CHAPTER 8	
<b>The TCP/IP Protocols.....</b>	<b>191</b>
RFCs.....	195
IP.....	196
IP Addresses .....	200
Address Classes .....	201
TCP.....	202
Port Numbers .....	206
UDP.....	209
ARP and RARP.....	211
TCP/IP Support Protocols.....	216
DNS.....	216
BOOTP.....	217
Trivial FTP.....	218
DHCP.....	219
ICMP.....	220
SMTP.....	222
SNMP.....	222
HTTP.....	223
HTTPS.....	225
NTP.....	225
TCP/IP Applications.....	227
PING.....	227
TRACERT.....	230
NBTSTAT.....	231
NETSTAT.....	232
FTP.....	236
Telnet.....	236
IP Version 6 (IPv6).....	238
Protocol Analyzers.....	239
Troubleshooting Techniques.....	240
Chapter Summary .....	242
Key Terms.....	243
Review Questions.....	244
Hands-On Projects.....	246
Case Projects.....	249
 CHAPTER 9	
<b>IPX/SPX, AppleTalk, and Other Network Protocols.....</b>	<b>251</b>
IPX/SPX.....	252
IPX.....	252
NCP.....	254

SPX .....	254
SAP .....	256
RIP .....	256
MLID .....	256
AppleTalk .....	256
DECnet .....	259
SNA .....	263
Troubleshooting Techniques .....	265
Chapter Summary .....	265
Key Terms .....	266
Review Questions .....	268
Hands-On Projects .....	271
Case Projects .....	274
CHAPTER 10	
<b>Switching and Routing .....</b>	<b>277</b>
Hubs versus Switches .....	278
Inside a Switch .....	281
Input Port Logic .....	281
Output Port Logic .....	282
Switching Fabric .....	282
Control Logic .....	282
Store-and-Forward Switching .....	284
Cut-Through Switching .....	284
Spanning Trees .....	285
Switches versus Routers .....	285
Routing Protocols .....	286
Autonomous Systems .....	290
Interior Gateway Protocols .....	294
Exterior Gateway Protocols .....	294
Classless Inter-Domain Routing .....	296
Distance-Vector Routing .....	298
RIP .....	299
Inter-Gateway Routing Protocol .....	300
Enhanced Inter-Gateway Routing Protocol .....	303
Link-State Routing .....	303
End System to Intermediate System .....	307
Intermediate System to Intermediate System .....	308
Integrated IS-IS .....	308
NetWare Link Services Protocol .....	309
Inter-Domain Routing Protocol .....	310
Exterior Gateway Protocol .....	310
Border Gateway Protocol .....	310
Policy Routing .....	312
Multi-Protocol Label Switching .....	312
Private Network-Network Interface .....	313

Layer 3 Switching . . . . .	313
Inside an ISP . . . . .	314
Troubleshooting Techniques . . . . .	316
Trouble at the ISP . . . . .	317
Chapter Summary . . . . .	318
Key Terms . . . . .	319
Review Questions . . . . .	322
Hands-On Projects . . . . .	325
Case Projects . . . . .	327
 CHAPTER 11	
<b>Network Management and Security . . . . .</b>	<b>329</b>
Network Management . . . . .	330
Disaster Recovery . . . . .	332
Fault Tolerance . . . . .	336
Protocol Analyzers . . . . .	338
SNMP . . . . .	339
Network Security . . . . .	340
Threats . . . . .	340
Viruses . . . . .	342
Network Sniffers . . . . .	343
Plain-Text Encryption . . . . .	343
Kerberos . . . . .	346
SSL . . . . .	347
Public-Key Encryption . . . . .	348
Certificates of Authority . . . . .	349
PGP . . . . .	349
Masquerading . . . . .	350
Firewalls . . . . .	351
Virtual LANs (VLANs) . . . . .	353
Intrusion Detection Systems . . . . .	356
Proxy Server . . . . .	357
IP Security . . . . .	357
Tunneling . . . . .	358
L2TP . . . . .	358
Denial-of-Service Attacks . . . . .	360
Hardening . . . . .	361
Storage Management . . . . .	361
Network Attached Storage . . . . .	361
User Management . . . . .	371
Troubleshooting Techniques . . . . .	372
Network Management . . . . .	372
Network Security . . . . .	372
Chapter Summary . . . . .	372
Key Terms . . . . .	376
Review Questions . . . . .	381
Hands-On Projects . . . . .	383
Case Projects . . . . .	386

PART 3

**Network Applications**

CHAPTER 12

**Electronic Mail . . . . . 389**

- What Is E-Mail? . . . . . 390
- Simple Mail Transfer Protocol . . . . . 390
- Format of E-Mail Messages . . . . . 392
- E-Mail Client Software . . . . . 393
- Sending an E-Mail Message . . . . . 397
- Receiving an E-Mail Message Using the Post Office Protocol . . . . . 399
- E-Mail Error Messages . . . . . 399
- Access to E-Mail Using the Web . . . . . 400
- Multipurpose Internet Mail Extensions . . . . . 401
- Internet Message Access Protocol . . . . . 404
- E-Mail Packet Capture . . . . . 404
- Troubleshooting Techniques . . . . . 411
- Chapter Summary . . . . . 413
- Key Terms . . . . . 414
- Review Questions . . . . . 415
- Hands-On Projects . . . . . 417
- Case Projects . . . . . 419

CHAPTER 13

**FTP and Telnet . . . . . 421**

- FTP Clients and Servers . . . . . 422
  - FTP Commands . . . . . 423
  - FTP Clients . . . . . 425
  - Built-In FTP Clients . . . . . 444
  - Secure FTP . . . . . 445
  - FTP Servers . . . . . 448
- Telnet Clients and Servers . . . . . 460
  - Telnet Clients . . . . . 464
  - Secure Telnet Communications . . . . . 469
  - Telnet Servers . . . . . 471
  - Telnet 3270 . . . . . 476
- Troubleshooting Techniques . . . . . 477
  - FTP File Types . . . . . 477
  - Directory Navigation . . . . . 477
  - Product HELP . . . . . 478
  - Telnet Keyboard Mapping . . . . . 478
- Chapter Summary . . . . . 479
- Key Terms . . . . . 480
- Review Questions . . . . . 481
- Hands-On Projects . . . . . 483
- Case Projects . . . . . 487

## CHAPTER 14

<b>Multimedia Networking</b> .....	<b>489</b>
<b>Image Files</b> .....	<b>490</b>
GIF Images .....	490
JPG Images .....	491
PNG Images .....	493
<b>Sound Files</b> .....	<b>494</b>
WAV Files .....	494
MID Files .....	496
MP3 Files .....	496
<b>The Digital Conversation</b> .....	<b>497</b>
Transmitting Data over a Network .....	498
Voice-over-IP .....	500
<b>Video</b> .....	<b>509</b>
MPEG Files .....	510
<b>Multicasting</b> .....	<b>510</b>
<b>Games</b> .....	<b>512</b>
<b>Troubleshooting Techniques</b> .....	<b>512</b>
Bandwidth issues .....	512
CODEC issues .....	514
Quality of Service .....	514
<b>Chapter Summary</b> .....	<b>515</b>
<b>Key Terms</b> .....	<b>516</b>
<b>Review Questions</b> .....	<b>518</b>
<b>Hands-On Projects</b> .....	<b>520</b>
<b>Case Projects</b> .....	<b>522</b>

## CHAPTER 15

<b>The Internet</b> .....	<b>525</b>
<b>The Organization of the Internet</b> .....	<b>527</b>
Network Address Translation .....	528
Internet Connection Sharing .....	528
<b>Windows and the Internet</b> .....	<b>529</b>
<b>Other Operating Systems on the Internet</b> .....	<b>529</b>
<b>World Wide Web</b> .....	<b>530</b>
<b>HTML</b> .....	<b>531</b>
XHTML .....	535
Cascading Style Sheets .....	536
<b>CGI</b> .....	<b>537</b>
<b>Java</b> .....	<b>542</b>
<b>JavaScript</b> .....	<b>545</b>
<b>Virtual Private Networks</b> .....	<b>546</b>
<b>Instant Messaging</b> .....	<b>548</b>
<b>Setting Up a Web Server</b> .....	<b>550</b>
<b>Related Sites</b> .....	<b>559</b>
<b>Troubleshooting Techniques</b> .....	<b>560</b>
Connecting to the Internet, Scenario #1 .....	560



Connecting to the Internet, Scenario #2 . . . . . 561  
 Connecting to the Internet, Scenario #3 . . . . . 561  
 Problems with the Web server? . . . . . 562  
 Problems coding Web pages? . . . . . 562  
 Problems with programming? . . . . . 562  
**Chapter Summary** . . . . . 562  
**Key Terms** . . . . . 564  
**Review Questions** . . . . . 566  
**Hands-On Projects** . . . . . 568  
**Case Projects** . . . . . 573

CHAPTER 16

**Writing a Network Application** . . . . . **575**  
 Client-Server Model . . . . . 576  
 Connection-Oriented Versus Connectionless Communication . . . . . 577  
 Sockets . . . . . 577  
 Network Programming Languages . . . . . 583  
     C/C++ . . . . . 583  
     C# . . . . . 583  
     Visual Basic . . . . . 584  
     Perl . . . . . 585  
     Java . . . . . 585  
 Network Applications . . . . . 586  
     Echo Server . . . . . 586  
     Time Server . . . . . 587  
     Tic-Tac-Toe . . . . . 588  
     Chat Server . . . . . 588  
     NETMAZE . . . . . 592  
 CGI IP Address Calculator . . . . . 595  
 Network Appliances . . . . . 600  
     IRP Device . . . . . 600  
     IPS Device . . . . . 601  
     LS100 . . . . . 601  
     Interfacing . . . . . 603  
 Troubleshooting Techniques . . . . . 603  
**Chapter Summary** . . . . . 604  
**Key Terms** . . . . . 605  
**Review Questions** . . . . . 606  
**Hands-On Projects** . . . . . 608  
**Case Projects** . . . . . 610

PART 4

**Network Operating Systems**

CHAPTER 17

**An Introduction to Networking with Windows** . . . . . **613**  
 Microsoft Networking . . . . . 614  
 The Network Neighborhood . . . . . 615

Network Printing . . . . .	617
Adding a New Local Printer . . . . .	618
Adding a Network Printer Using TCP/IP . . . . .	621
Sharing Files over a Network . . . . .	625
Finding a Networked Computer . . . . .	627
Working with Network Drives . . . . .	628
Dial-Up Networking. . . . .	630
ICA Technology. . . . .	632
Connecting to the Internet. . . . .	632
Troubleshooting Techniques . . . . .	633
Chapter Summary . . . . .	637
Key Terms. . . . .	637
Review Questions. . . . .	638
Hands-On Projects . . . . .	640
Case Projects . . . . .	642
 CHAPTER 18	
<b>Windows Domains . . . . .</b>	<b>643</b>
Windows NT Operating System Logon . . . . .	644
Windows NT Security Dialog Box. . . . .	646
Domains . . . . .	648
Windows 2000 . . . . .	649
Windows 2000 Server. . . . .	650
Windows 2000 Professional . . . . .	653
Windows NT Domains. . . . .	654
Basic Capabilities of Windows Server Operating Systems. . . . .	657
Client Support . . . . .	657
Interoperability . . . . .	658
Authentication . . . . .	658
File and Print Services. . . . .	659
Application Support . . . . .	659
Security . . . . .	660
Adding a Client to a Windows Network . . . . .	660
Logging onto a Network. . . . .	662
Running a Network Server . . . . .	665
Dynamic Host Configuration Protocol . . . . .	670
Remote Access Service . . . . .	671
User Profiles . . . . .	675
Security . . . . .	677
Windows 2000 Domains. . . . .	677
Windows 2003 Server. . . . .	682
Windows 2008 Server. . . . .	684
Troubleshooting Techniques . . . . .	685
Chapter Summary . . . . .	687
Key Terms. . . . .	688
Review Questions. . . . .	689

Hands-On Projects . . . . .	691
Case Projects . . . . .	692
 CHAPTER 19	
<b>UNIX and Linux . . . . .</b>	<b>695</b>
Linux Environment . . . . .	697
Linux Graphical User Environments . . . . .	700
Installation and Configuration . . . . .	701
Application Software . . . . .	703
System Administration, Management, and Security . . . . .	708
TCP/IP Network Management . . . . .	710
Samba . . . . .	712
Network Information Services . . . . .	722
Network File System Services . . . . .	723
Apache Web Server . . . . .	725
Linux Documentation . . . . .	727
Troubleshooting Techniques . . . . .	728
Chapter Summary . . . . .	729
Key Terms . . . . .	730
Review Questions . . . . .	731
Hands-On Projects . . . . .	733
Case Projects . . . . .	736
 CHAPTER 20	
<b>Other Network Operating Systems . . . . .</b>	<b>737</b>
NetWare . . . . .	738
Installing/Upgrading NetWare . . . . .	738
NetWare Timeline . . . . .	739
NDS . . . . .	739
HCSS . . . . .	741
Menus, Login Scripts, and Messaging . . . . .	744
Security . . . . .	747
Management . . . . .	749
Print Services . . . . .	752
NetWare Client Software . . . . .	752
Adding a NetWare Server to a LAN . . . . .	755
Connecting to a NetWare Server . . . . .	755
Open Enterprise Server . . . . .	756
OpenVMS . . . . .	756
Macintosh OS (Mac OS) . . . . .	757
Mac OS X Details . . . . .	757
Interoperability . . . . .	759
Installing OS X . . . . .	760
Macintosh Networking . . . . .	761
Open Transport . . . . .	763
File Systems . . . . .	764
Print Services . . . . .	765
Security . . . . .	766

OS/2 Warp .....	767
Additional Network Operating Systems .....	767
Troubleshooting Techniques .....	768
Chapter Summary .....	768
Key Terms .....	769
Review Questions .....	770
Hands-On Projects .....	772
Case Projects .....	772

## PART 5

**Network Security and Forensics**

## CHAPTER 21

<b>Cryptography and Security</b> .....	<b>775</b>
History of Cryptography and Security .....	776
Symmetric Versus Asymmetric Encryption .....	776
Encryption Strength .....	778
Encryption Algorithms .....	783
Encryption Versus Hashing .....	787
Password Hashing .....	788
Digitally Signing an Email .....	788
Hash Algorithms .....	789
Steganography .....	789
Hiding Information inside a WAV File .....	791
Hiding Information inside a JPG Image .....	793
Troubleshooting Techniques .....	795
An Email Investigation .....	795
Testing a VPN Connection .....	796
Sometimes, You Just Have to Guess .....	796
Chapter Summary .....	796
Key Terms .....	797
Review Questions .....	798
Hands-On Projects .....	800
Case Projects .....	803

## CHAPTER 22

<b>Security Hardware</b> .....	<b>805</b>
Media Vulnerabilities .....	806
Managed Switches .....	808
Security Vulnerabilities in a Switch .....	809
Firewalls .....	811
IDS Hardware .....	813
Authentication .....	814
Biometric Devices .....	814
Fingerprint Readers .....	814
Voice Authentication .....	817

Hand Geometry Readers . . . . . 817  
 Handwriting Authentication . . . . . 817  
 Facial Recognition . . . . . 818  
 Iris and Retinal Scanners . . . . . 818  
**Fault Tolerance . . . . . 819**  
 Adding Fault Tolerance to a Computer System . . . . . 820  
 Adding Fault Tolerance to a Computer Network . . . . . 822  
**Physical Security. . . . . 824**  
 Site Location . . . . . 824  
 Moat . . . . . 824  
 Lighting . . . . . 824  
 Fences . . . . . 824  
 Mantrap . . . . . 825  
 Cameras . . . . . 825  
 Motion and/or Heat Sensors . . . . . 825  
 Doors and Locks . . . . . 825  
 Windows . . . . . 825  
 Physical Security Plan . . . . . 825  
**Troubleshooting Techniques . . . . . 826**  
**Chapter Summary . . . . . 827**  
**Key Terms. . . . . 827**  
**Review Questions. . . . . 829**  
**Hands-On Projects . . . . . 831**  
**Case Projects . . . . . 833**

CHAPTER 23

**Security Software . . . . . 835**  
 Packet Sniffing . . . . . 836  
 Port Scanning . . . . . 839  
 Additional Vulnerabilities . . . . . 843  
**Password Cracking. . . . . 844**  
 Guessing a Password . . . . . 845  
 Using Brute Force to Crack a Password . . . . . 845  
 Dictionary Attacks . . . . . 846  
 Preventing a Password Attack . . . . . 846  
**Intrusion Detection. . . . . 847**  
 Host-Based Intrusion Detection . . . . . 848  
 Network-Based Intrusion Detection . . . . . 848  
**Secure Remote Access. . . . . 849**  
**Security Policies and Procedures . . . . . 850**  
 Storage Media . . . . . 850  
 Portable Devices . . . . . 851  
 Software . . . . . 851  
 Services . . . . . 851  
 The Acceptable Use Policy . . . . . 852  
 Security Procedures . . . . . 852  
**Troubleshooting Techniques . . . . . 853**  
**Chapter Summary . . . . . 853**  
**Key Terms. . . . . 854**  
**Review Questions. . . . . 856**

Hands-On Projects . . . . .	858
Case Projects . . . . .	860
CHAPTER 24	
<b>Forensic Techniques . . . . .</b>	<b>861</b>
<b>Forming a CSIRT. . . . .</b>	<b>862</b>
The Incident Response Process . . . . .	863
Pre-incident Preparation . . . . .	863
Detection of Incidents . . . . .	863
Initial Response to the Incident . . . . .	863
Formulate a Response Strategy . . . . .	864
Investigate the Incident . . . . .	864
Report the Findings . . . . .	865
Resolve the Incident . . . . .	865
<b>Digital Evidence Handling. . . . .</b>	<b>865</b>
<b>File Systems and Operating Systems. . . . .</b>	<b>867</b>
FAT . . . . .	868
NTFS . . . . .	873
Operating Systems . . . . .	875
<b>Live Analysis Versus Static Analysis. . . . .</b>	<b>879</b>
<b>Where is the Information?. . . . .</b>	<b>880</b>
<b>Analyzing Network Traffic. . . . .</b>	<b>885</b>
<b>Malware Analysis. . . . .</b>	<b>887</b>
An Encrypted Script, Part 1. . . . .	888
An Encrypted Script, Part 2. . . . .	890
Making the Code Harmless. . . . .	893
<b>Legal and Ethical Issues . . . . .</b>	<b>895</b>
<b>The Forensic Marketplace. . . . .</b>	<b>896</b>
<b>Troubleshooting Techniques . . . . .</b>	<b>897</b>
<b>Chapter Summary . . . . .</b>	<b>899</b>
<b>Key Terms. . . . .</b>	<b>899</b>
<b>Review Questions. . . . .</b>	<b>901</b>
<b>Hands-On Projects . . . . .</b>	<b>904</b>
<b>Case Projects . . . . .</b>	<b>912</b>
GLOSSARY . . . . .	<b>913</b>
INDEX . . . . .	<b>929</b>





# Preface

Computer networks are everywhere. They span the globe, interconnecting with each other, weaving a web of communication that extends outward to the domain of satellites orbiting above the earth. They fail; they heal themselves; they move staggering amounts of information between distant locations in an instant. They are in our schools, our businesses, and our homes.

The purpose of this textbook is to explain the mystery behind the computer network, its hardware and software components, how it connects with other networks, the services it provides, network design and implementation, how network problems can be solved, and the security aspects of networking and computing. Concepts and techniques are presented through real-world examples (such as examining all the packets captured while loading a Web page or sending e-mail). Whenever possible, the Internet is used to explain a new network service or mechanism. This includes heavy use of various sites located on the World Wide Web. We describe how many of the networking concepts are used in several network client-server applications, including a virtual reality network maze game (NetMaze), Java applets, and CGI programming examples.

## **Intended Audience**

This book is suitable for all readers with an interest in computer networking and especially students in computer engineering technology, electrical engineering technology, networking technology, information technology, telecommunications technology programs, corporations, and the government.



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