INDEX

Page numbers in italics refer to figures, tables, and listings.

Numbers

2X Terminal Server, 226
3COM, 164
3G broadband networks, 174
10/100 indicator lights, 75
10Base-T networks, 14–15
10 Mbps operations, 29
100Base-T networks, 14–15
100 Mbps operations, 29
1000Base-T networks, 14

A

Access, Microsoft, 95
access points, Wi-Fi, 53, 55, 62, 80–81, *81*, 85–87, 90, 99, 111, 113, 174
AC power, 17, 48, 49, 50, 51, 60, 61, 67, 75, 242
ACT indicator lights, 75
addresses and names, 36–41, *38*, 48. *See also* Internet Protocol (IP), addresses
ad hoc networks, 20
administrators, 152
Advanced Maryland Automatic Network Disk Archiver (Amanda), 104
AHAM (Association for Home Appliance Manufacturers), 223
AIFF (Audio Interchange File Format) files, 209, *210*
AIM (AOL Instant Messenger), 158, *234–235*
AirPort Extreme, 99, *99*, 181
all-in-one devices, 199–201, *200*
Amanda (Advanced Maryland Automatic Network Disk Archiver), 104
American Standard Code for Information Interchange (ASCII), 10
  encryption keys, 180–181, 182
AM radios, 209, 214
analog-to-digital conversion, 206–207, 209, 211–212
antennas, 4, 80, *82*, 84–85
antivirus programs, 245
AOL Instant Messenger (AIM), *158*, 234–235
Apache web server, 95, 156
Apple, 21, 95
  AirPort Extreme, 99, *99*, 181
  computers, 94
  iChat, 237
ASCII. *See* American Standard Code for Information Interchange (ASCII)
.asia, 40
Association for Home Appliance Manufacturers (AHAM), 223
Audacity, 208, 211
audio
  clients, 211, 212, 213
    devices, 213–214, *214*
  controls, 51
  converters, 206, 207–209, 211
  files, 203–205, 206–214, *210*, *212–214*
    formats, 209–210, *210*
  messaging, 237
  player programs, 210–211
  servers, 7–8, 207–209, 212–213, *213*
Audio Interchange File Format (AIFF) files, 209, *210*
audiophile music servers, 209
automatic printer switches, 194–195
automatic updates, 185–186, *186*
Auxiliary input, 212

B

baby monitors, 205
backup files, 100–104, *101*, *103*, *104*
BackupPC, 104
Backup Status and Configuration, 103
bands, 79
bandwidth, 3, 4
bar code readers, 224
Baseline Security Analyzer, 188, *188*
BBC, 3
Belkin, 216
BIOS utilities, 71, 75
BitDefender Online Scanner, 245
bits, *10*, 10–11
.biz, *40*
BlackBerry devices, 77
bridges, 32
Broadcast Wave files, *210*
brute-force programs, 153
BSD systems, 95, 98, 159, 164, 172, 173
BSSID, 177–179
built-in Ethernet window, *125*
built-in printer servers, 194
bulk cables, 56

C

cable modems, 110
cables
  bulk, 56
  CAT5/CAT5e/CAT6 data, 50, 56–57, 66
  coaxial, 17, 65
  for combination boxes, 33
  DVI, 219, 220
  Ethernet, *15*, 47, 53, 56–60, *60*, 66, *66*, 77, 192
  jumper, 56
  overview of, *33*, 56
  RG6/U, 65
  troubleshooting, 242
  twisted-pair, 15, *15*
  video, 65–66
cable TV
  connections, 32, 64, 99
  outlets, 48, 49
cameras/webcams, 8, *204*, 204–205, 237
CardBus, 73
Carrier Sense Multiple Access with Collision Detection (CSMA/CD), 14
CAT5/CAT5e/CAT6 data cables, 50, 56–57, 66
CBS, 3
CDs (music), 208, 209, 211
CentOS, 95
CHA-1 (Connected Home Appliances) standard, 223
chatrooms, 237
checksums, 13
Cisco, 161, 164
client firewall programs, 157, 158–159
clients, audio, 211, 212, 213
clients and servers, 23–25, *25*
clones, 100
coaxial cables, 17, 65
collisions, 14, *18*
.com, 39, *40*
combination boxes, 33
commands. *See* network commands
communication channels, 3, 11
complete images, 100
compressed audio files, 209
Computer Supported Cooperative Work, 233
computer-to-network connections. *See* network connections
conferencing, remote, 205, 237
Connected Home Appliances (CHA-1) standard, 223
control centers. *See* networks, control centers
controller cards, 204
conversions, audio, 206, 207–209, 211
converters
  analog, 206–207, 209, 211–212
  audio, 206, 207–209, 211
  power, 61
  TV/video, 219
.coop, 40
copying devices, 199–201, *200*
country codes, domain name, 39, 40
CSMA/CD (Carrier Sense Multiple Access with Collision Detection), 14
CUPS printer control program, 199
Cyberguys, 57

D

data
  cable color codes, telephone lines, *65*
  circuit-terminating equipment (DCE), 18–19
  communications equipment (DCE), 18–19
  entry, remote, 224
  networks, 4
  outlets, 48, *56*, 56–57, *59*, *60*, 67–68

Network Know-How
(C) 2009 by John Ross

packets, 11–13, *12*
terminal blocks, 52, *52*
transfer speeds, 14–15
tunnels, 159, 161
data-file-only backups, 100
data terminal equipment (DTE), 18–19
DCE (data communications equipment or data circuit-terminating equipment), 18–19
decoders, audio/video, 218
default gateways, 42, 43, 114, 118, 246
Dell computers, 94
demodulation, 6, 108
denial of service (DoS) attacks, 189
designing networks, 47–54, *48*, *49*, *52*, *53*
destinations, 206, 207
device drivers, 74–75
DHCP. *See* Dynamic Host Configuration Protocol (DHCP)
dial-up modems, 109
dictionary attacks, 183
digital audio files. *See* audio, files
digital conversions, 209
digital data streams, 204–205
digital media receiver (DMR), 143
digital-to-analog conversion, 206–207, 211
digital video recorder (DVR), 216–217
digital visual interface (DVI), 218
DirSync Pro, 232
Display Properties setting, 231, *231*
D-Link
programs, 180–181, *181*, 216
switches, *64*
dm-crypt, 185
DMR (digital media receiver), 143
domain names. *See also* Internet Protocol (IP), addresses
country codes in, 39, 40
subdomain, 39
top-level, 39–41, *40*
Domain Name System (DNS), 39–41, 42, 44, 109, *158*
servers, 40–41, 42, 43–44, 109, 115, 118, 124, 127, 246
DoS (denial of service) attacks, 189
dot, 39
downstream switches, 67
"drive-by logins," 174
drivers, device, 74–75
DSL
connections, 6, 22, 32, *62*, 64, 99
modems, 110
DTE (data terminal equipment), 18–19
DVI (digital visual interface), 218–219, 231
DVI-to-DVI cables, 219
DVI-to-HDMI cables, 219, 220
DVR (digital video recorder), 216–217
Dynamic Host Configuration Protocol (DHCP), 37–38, 42, 43, 86, 109–115, 246
servers, 38, 109–115, *111*, *112*, 117–118, 124, 126, *126*, 129, 157–158, 163
dynamic IP addresses, 37–38, 86, 109

E

EAP (Extensible Authentication Protocol), 182
Edirol, 211
.edu, 39, *40*
Elcomsoft Distributed Password Recovery, 183
electrical outlets, 48–50, *49*, 52, *52*, 55–56, 59
electronics suppliers, 57
email services, 105
E-Mu, 211
encryption methods, 54, 89–91, 159
ASCII keys, 180–181
end-to-end, 89, 159
hex keys, 180–181, *181*
WEP, 90, 91, 174–175, 176, 179–182, *181*, 183, 217
wireless security and, 174–184, *175*, *178*, *181*
WPA, 54, 78, 90, 91, 136, 160, 174–176, 179, 181, 182–183, 194, 217
WPA2, 90, 176
enhanced systems, 78–79
equipment, data communication, 18–19
error checking, 9, 13
error messages, 229, 239–240, 241, 247
ESET Online Scanner, 245
ESSID, 177–179
Ethernet
cables, *15*, 47, 53, 56–60, *60*, 66, *66*, 77, 192
hubs, 29, *29*, 80, 220
LANs, 14–16, 71
networks, 14–16, 17, 28, 29, 47, 50, 53, 54, 56, 69–75, *71*, 72, *125*
outlets, 53
ports, 4, 70–74, *71*, 85, 97, 193, 201, 216
switches, *30*, 53, *53*, 55, 62, 80, *193*

Network Know-How
(C) 2009 by John Ross

Exact Audio Copy, 208
Extensible Authentication Protocol (EAP), 182
external controllers, 204–205
external printer servers, *192*, 192–193
extreme systems, 78–79

F

faxing devices, 199–201, *200*
F connectors, 218
fiber optic links, 6
field-replaceable unit (FRU), 82
File and Printer Sharing for Microsoft Networks, 196, *196*
file servers
  backup files, 100–104, *101*, *103*, *104*
  choosing, 94
  home usage of, 105
  NAS (network-attached storage) devices, 93, 95, 97–98, *98*, 100, 108
  overview of, 24, 93–94
  sharing permissions, 96–97, *97*
  software/systems for, 94–96, *96*, 97–99, *98*, *99*
  storing files on, 96–97
  USB device servers, 99, *99*, 100
file sharing
  compatibility issues, 131
  computer-to-network connections, 120
  dialogs, 140, *140*
  Linux, 131, 147–150, *148–150*
  Macintosh OS X, 131, *134*, *135*, 143–147, *144–146*
  media sharing, 143
  overview of, 5, *5*, 131–132
  passwords and privacy, 133–136, *134*, 143
  permission levels, 141–143
  printer sharing, 7, 143, *196*, 196–199, *198*, *199*
  Server Message Block (SMB) protocol, 131, 143, 145–147, *146*, 150
  Simple File Sharing, *132*, 132–133, 136
  Unix, 131, 147–150, *148–150*
  usernames, 140–141, 145
  Windows Vista, 131, 136–143, *137–142*
  Windows XP, 131, *132*, 132–136, *134*, *135*
file storage servers, 96–97
file synchronization, 232
File Transfer Protocol (FTP), 39, 157, *158*
Finger, *158*
Firefox, 24
firewalls, 90, 91, 154–159, *155*, *158*, 164, 172, 176
firewall servers, 24
FireWire ports, 4, 21, 205, 211
fixed IP addresses, 37–38, 109, 118
FLAC (Free Lossless Audio Codec) files, *210*
flash drives, 1, 3, 120, 217
floor plans, 47–48, *48*, 54, 55, 59
floppy disks, 3, 4
FM radios, 214
Folder Options window, 132, *132*
frames, 11–13, 248
FreeBSD, 95, 98, 173
FreeFileSync, 232
Free Lossless Audio Codec (FLAC) files, *210*
FreeNAS, 95, 98, *98*
FreeNX, 226
FreeS/WAN, 164, 173
FRU (field-replaceable unit), 82
FTP (File Transfer Protocol), 39, 157, *158*
full duplex mode, 30

G

Gadu-Gadu, 235
game consoles, 220–222
game servers, 24
gateway addresses, 109, 114–115
gateway routers, 6, *6*, 32, 109–110
Gigabit Ethernet networks, 14, 15, 29, 56, 72
Gmail, 105
Gnome, 104, *127*, 127–128, *128*, 147–149, *148*
GoodSync, 232
Google Talk, 234–235
Gopher, *158*
.gov, *40*
gramophones, 206–207, *207*
graphical user interface (GUI), 150
guest accounts, 152
GUI (graphical user interface), 150

H

hackers, 82, 92, 157, 249
handoffs, 177
handshaking, 13–14
HDMI. *See* High Definition Multimedia Interface (HDMI)
HDTV screens, 219, 220

Network Know-How
(C) 2009 by John Ross

headers, 11–13, *12*
Hewlett-Packard (HP), 95
hex encryption keys, 180–181, *181*
hidden networks, 179
High Definition Multimedia Interface (HDMI), 217
  cables, 219, 220
high-gain directional antennas, 85
high-speed modems, 109
home appliances, 8, 222–223
home automation, 8, 49, 51, 223
home entertainment systems, 7–8, 48, 49, 203, 206
Home Phoneline Networking Alliance, 17
HomePlug, 17, *17*
HomePNA, 17
home run wiring, 51–52, *52*, 53
home security devices, 8, 205
hosting services, 105
host names, 43
Hotmail, 105
hotspots, 77–78, 89
HOWTO, 159, 164
HP (Hewlett-Packard), 95
HTTP. *See* HyperText Transfer Protocol (HTTP)
hubs
  data, 30, 55
  designing, 47
  Ethernet, 29, *29*, 80, 220
  network, 120
  overview of, 28–30, *29*, 111
  for printers, 193, 201
hybrid wireless networks, 89
HyperTerminal programs, 22
HyperText Transfer Protocol (HTTP), 24, 39
  web servers, *158*

I

IANA (Internet Assigned Name Authority), 37, 38, 157
IBM, 82, 94
iChat, 237
IDE hard drives, 97
IEEE (Institute of Electrical and Electronics Engineers), 21, 78
`ifconfig`, 43
IM (instant messaging), 7, 233–237
incremental backups, 100
indicator lights, 75
individual bits, 10, *10*
industrial electronics suppliers, 57
.info, *40*
Infrared Data Association (IrDA), 20
  ports, 20–21, *21*
infrared networks, 20–21, *21*
input/output (I/O) ports, 4, *18*, 18–19, *19*
instant messaging (IM), 7, 233–237
Institute of Electrical and Electronics Engineers (IEEE), 21, 78
Intel, *88*, 164
internal controllers, 204–205
internal expansion cards, *72*, 72–73
Internet Assigned Name Authority (IANA), 37, 38, 157
Internet-based IM services, 234–235
Internet connections, network, 110–115, *111*, *112*
Internet Explorer, 24, 174
Internet Protocol (IP), 35–36, 54, 123, *123*, 126
  addresses, 36–41, *38*, 42, 45, 86
    computer-to-network connections and, 118, 124, 126–128, *127*
    domain names and, 38–41, *40*
    dynamic, 37–38, 86, 109
    firewalls and, 157
    fixed, 37–38, 109, 118
    network-to-Internet connections and, 110–115, *111*, *112*
  filters, 159
  networks, 162
Internet Protocol Properties window, *123*
Internet radio, 209, 214
Internet Relay Chat (IRC) servers, 39
Internet service providers (ISPs), 22, 31, 41, 110, 113, 114
  problems, 251
Internet-to-network connections, 6, 107–115, *108*, *111*, *112*
I/O (input/output) ports, 4, *18*, 18–19, *19*
IP. *See* Internet Protocol (IP)
IPConfig, 41–43, *42*
iPhone, 77
IP Masquerade, 164
iPod, 8, 206, 207, 210
IPsec network links, 162, 163, 164, 169, 173
IPX networks, 162
IRC (Internet Relay Chat) servers, 39
IrDA. *See* Infrared Data Association (IrDA)
ISA Ethernet adapters, 72

Network Know-How
(C) 2009 by John Ross

ISM bands, 80
ISPs. *See* Internet service providers (ISPs)
iTunes, 24

J

Jabber, 235
jacks. *See* ports
Jameco, 57
jumper cables, 56

K

Kaspersky Online Scanner, 245
KDE, 104, *128*, 128–129, *129*, 148, *148*, 149
Kerberos, *158*
keyhole slots, 63–64, *64*
Konquerer file manager, 148, *148*, 149–150, *150*

L

L2TP (Layer Two Tunneling Protocol), 162, 163–164, 169
LANguard, 158
LANs. *See* local area networks (LANs)
Lantronix UBox 4100, *99*
laptops
  interface adapters, 81–82, *82*
  network adapters, 73–74, *74*
Laughing Squid web hosting, 45
Layer Two Tunneling Protocol (L2TP), 162, 163–164, 169
LED indicator lights, 240, 242–243
Level 1–5 access, 133–136
Leviton, 67
LG Electronics, 223
limited backups, 100
line of sight, 85
LINK indicator lights, 75
Linksys, 216
Linux
  backup files, 100, 104
  computer-to-network connections, 117, *127*, 127–129, *128*, *129*
  CUPS printer control program, 199
  file servers, 94–95, 96, 215
  file sharing, 131, 147–150, *148–150*
  firewalls, 154–159, *155*, *158*, 164
  network adapters, 73–74
  network-to-Internet connections, 115
  OpenVPN for, 173
  remote desktop programs, 229
  text commands for, 43
  troubleshooting info, 247
  VPN clients for, 172-173
  VPN servers for, 164
  wireless control programs, 87
LinuxCD, 95
Linux Online!, 104
live conversations, 205, 233–237
Living Network Control Protocol (LnCP), 223
local area connections, 42, *42*, 122–123, 196
local area networks (LANs)
  addresses, 37–38
  computer-to-network connections, 117–123
  connections to, *20*, 21, 32, 41, 49, 55
  data transfer speeds, 14–15
  Ethernet, 14–16, 71
  file sharing, 137
  firewalls, 154–159, *155*, *158*
  game consoles, 220–222
  instant messaging, 234–236, *235*
  network-to-Internet connections, 107–115, *108*, *111*, *112*
  overview of, 31–32, *32*
  remote terminals, 23, *23*
  security methods for, 91–92
  troubleshooting for, 248–251
  VideoLAN, 218
  VPNs and, 159–161, *160*, *161*, 163
  Wi-Fi and, 54, 77–78
  wireless security, 54, 89–92, 174–184, *175*, *178*, *181*
LostPC, 185
LPs (music), 208, 209, 211

M

MAC
  addresses, 43, 91, 184
  authentication, 184–185
Macintosh OS X, 35, 43, 44
  backup files, 100, 103–104, *104*
  computer-to-network connections, 117, *124*, 124–127, *125*, *126*, *127*
  file servers, 94–95, 96, 99, *99*, 215
  file sharing, 131, *134*, *135*, 143–147, *144–146*
  IP addresses, 112, *112*, 118
  network adapters, 73–74
  network security, 184–185
  network-to-Internet connections, 115
  OpenVPN for, 173

Network Know-How
(C) 2009 by John Ross

remote desktop programs, 226–229, *227*, *228*
troubleshooting info, 247
wireless control programs, 87
Mac-to-Windows remote access, 226
mail servers, 24
M-Audio, 211
MaxiVista, 229–232
Mbps (megabits per second), 3
McIntosh MS750, 209
Media Center Extender, 208
media sharing, 143
meebo, 234
megabits per second (Mbps), 3
mesh topologies, 28
messages, sending, 11, 13–14
message servers, 234
messaging, 233–237
microphones, 8, 204, 205
Microsoft
Baseline Security Analyzer, 188, *188*
Knowledge Base, 247
MSN Messenger, *158*
Protocol Analyzers, 248, *250*
Resource Kit, 163
SQL, 95
SyncToy, 232
TechNet articles, 163
Windows. *See* Windows
Xbox 360, 220, 222
microsoft.com, 44
microwave radio links, 3
mini-PCI cards, 81–82, *82*, 84, 87
MoCA (Multimedia over Coax Alliance), 17
modems, 6
cable, 110
combination boxes, 33
configuring, 86
dial-up, 109
DSL, *62*, 110
high-speed, 109
installing, 59, 61, 62–64, *63*
location of, 50
network-to-Internet connections, 108–115
null, 19, *19*
PTSN, 21–22
telephone line connections and, 21–23
modular structured wiring center, 59, 63
modulation, 6, 108
monitors, multiple, 229–232, *230*, *231*
motherboards, 70
mounting brackets, 56, *56*
mounting frames, 59
MPEG Layer-3 (MP3) files, 208, 209–210, *210*
MPlayer, 218
MSN Messenger, *158*
Multimedia over Coax Alliance (MoCA), 17
music clients, 211, 212, 213
devices, 213–214, *214*
music servers, 7–8, 24, 207–209, 212–213, *213*
Muuss, Mike, 43

N

.name, *40*
names and addresses, 36–41
NAS (network-attached storage) devices, 93, 95, 97–98, *98*, 100, 108
NAT (Network Address Translation), 37, 67, 157–158, 159
National Electric Code, 51
Nautilus file browser, 147–148, *148*
.net, 39, *40*
NetBEUI networks, 162
NetBSD, 159, 164, 173
Netgear, 161, 213, 216
Netscape Navigator, 174
network adapters
for laptops, 73–74, *74*
USB, 73
Network Address Translation (NAT), 37, 67, 157–158, 159
Network and Sharing Center, 136–138, *137*, *138*
network applications
MaxiVista, 229–232, *230*
messaging, 233–237
multiple monitors, 229–232, *230*, *231*
overview of, 225
remote controls, 232
remote desktop programs, 226–229, *227*, *228*
network-attached storage (NAS) devices, 93, 95, 97–98, *98*, 100, 108
network commands
`ifconfig`, 43
IPConfig, 41–43, *42*
`ping`, 36, *43*, 43–44
TraceRoute, 36, *44*, 44–46, *45*
network-compatible home appliances, 223

Network Know-How
(C) 2009 by John Ross

network configuration settings, 117–129, *118–129*
network connections
  computer-to-network
    Linux, 117, *127*, 127–129, *128*, *129*
    local area, 122–123, *123*
    Macintosh OS X, 117, *124*, 124–127, *125*, *126*, *127*
    overview of, 117–118
    Unix, 117, *127*, 127–129, *128*, *129*
    Windows, 117, *118*, 118–124, *119*, *120*, *121*, *122*, *123*
    Wireless Network Connections profile, 122
  network-to-Internet, 107–115, *108*, *111*, *112*
  other devices
    audio/music files, 203–205, 206–214, *210*, *212–214*
    baby monitors, 205
    bar code readers, 224
    game consoles, 220–222
    home appliances, 8, 222–223
    home entertainment systems, 7–8, 48, 49, 203, 206
    Internet radios, 209, 214
    live conversations, 205, 233–237
    microphones, 8, 204, 205
    remote conferencing, 205, 237
    remote data entry, 224
    remote sensors and controls, 223–224
    stereos, 206, 212
    surveillance monitors, 205
    traffic monitors, 204
    video files, 203–205, 215–220
    webcams/cameras, 8, *204*, 204–205, 237
  types
    ad hoc networks, 20
    clients and servers, 23–25, *25*
    common elements of, 9–14
    DTE/DCE equipment for, 18–19
    error checking, 9, 13
    Ethernet, 14–16, *15*
    FireWire ports, 4, 21, 205, 211
    infrared networks, 20–21, *21*
    Plain Old Telephone Service (POTS), 21–22
    point-to-point, 19–20, *20*, 51–52, *52*
    powerline networks, 16–17
    Public Telephone Switched Network (PTSN), 21–22, *22*
    remote terminals, 23, *23*
    servers, 23–25, *26*
    telephone line connections, 21–22, *22*
    Wi-Fi, 16. *See also* Wi-Fi (wireless fidelity)
    wired networks, 16
  wireless programs, *87*, 87–89, *88*
Network Connections window, *118*, 118–119, *122*, 169–170, 173, 190
networked Internet radios, 214
networked receivers, 214
Network Magic, 248–249, *249*
Network Monitor, 248, *250*
networks
  control centers
    designing, 50–53
    installing, 58–68, *60*, *63*, *65*
    for small networks, 25, 67–68
  control devices, 33, 37, 61, 111, 115
  defined, 1–3
  designing, 47–54, *48*, *49*, *52*, *53*
  discovery, 137
  error messages, 229, 239–240, 241, 247
  gateway configuration, 115
  hubs, 120
  installation
    cables, 56–57
    cable TV connections, 64–66
    connectors, 55–56
    control centers, *50–53*, 58–68, *60*, *63*, *65*
    DSL connections, 22, 62, 64, 99
    expanding, 67
    small networks, 25, 67–68
    surface boxes, 55–56
    telephone lines, connecting, 64–65, *65*
    terminating network cables, 66–67
    wall plates, 49, *49*, 50, 52, 55–56, *56*, 67
    wiring, 16–17, 57–67, *66*
  interface adapters, Wi-Fi, 81–85, *82*, *83*, *84*, 85, 87
  names. *See* SSIDs
  notebooks, 244–245
  planning for, 47–54, *48*, 55
  problems. *See* troubleshooting
  profiles, 118
  security. *See also* encryption methods
    access levels, 152
    administrators, 152
    Baseline Security Analyzer, 188, *188*

Network Know-How
(C) 2009 by John Ross

controlling users, 189
DoS (denial of service) attacks, 189
firewalls, 90, 91, 154–159, *155*, *158*, 164, 172, 176
guest accounts, 152
intruders, 152–159, 174
IP filters, 159
MAC authentication, 184–185
naming networks, 177–179, *178*
passwords, 90, 133–136, *134*, 143, 152–154, *154*, 205
physical security, 184–185
port assignments/port numbers, 157–158, *158*
sneakernets, 4
updates and patches, 185–188, *186–187*
user accounts, 152
wireless security, 54, 89–92, 174–184, *175*, *178*, *181*
sniffers, 178, 179, 249
topologies, 27–28, *28*
webcams, 205
wiring methods, 16–18
Network Setup Wizard, 118–122, *119*, *120*, *121*
Network Stumbler, 179
Network window, *125*
Newegg.com, 57
Nintendo Wii, 220, 221
NIST Cerberus, 173
NNTP (network news), *158*
nodes, 14, 48–50
noise, 13, 17
nondirectional antennas, 85
Novell, 95
null modems, 19, *19*
numeric IP addresses, 36–37, 42, 109, 110

O

OEM (original equipment manufacturer), 85, 95
Ogg Vorbis files, *210*
omnidirectional antennas, 85
ones and zeroes, 10, *10*. *See also* Internet Protocol (IP), addresses
online virus scans, 245
OpenBSD, 159, 164, 173
OpenDNS, 41, 114
open source operating systems, 96
OpenVPN, 164, 173
Opera, 24
operating channels, Wi-Fi, 79–80, *80*, 86
.org, *40*
original equipment manufacturer (OEM), 85, 95
outlet blocks, 59–60, *60*
outlets
cable TV, 48, 49
data, 48, *56*, 56–57, *59*, *60*, 67–68
electrical, 48–50, *49*, 52, *52*, 55–56, 59
Ethernet, 53
telephone wall, 48, 49, 51
video, 48, 49, 50, 51
wall-mounted, 59

P

Packet Filter (PF), 159
Packet Internet Gopher, 43
packets, 11–13, *12*
Panda ActiveScan, 245
parallel ports, 4, 16, 192, *192*, 194
parallel signals, 10
parity bits, 13
passwords, 90, 133–136, *134*, 143, 152–154, *154*, 205
patch cords, 56–57
patches and updates, 185–188, *186–188*
PC card adapters, 82–83, *83*
PC Express Cards, 82–83
PCI expansion cards, 72, *72*, 84, 204
PCMCIA sockets, 73, 82
peer-to-peer messaging, 234
PF (Packet Filter), 159
Philips, 213
picture elements, 10, 219
picturephones, 237
Pidgin, 234
pigtails, 85
`ping` command, 36, *43*, 43–44
pipsec, 173
pixels, 10, 219
Plain Old Telephone Service (POTS), 21–22
PlayStation, 220–221
plug-in modules, 83–84, *84*
plugs, 66–67, 70, *70*, 75, 193, 218, 242
plywood sheets, 59, 66
point-to-point networks, 19–20, *20*, 51–52, *52*
Point-to-Point Tunneling Protocol (PPTP), 162, 163–164, 172
POP3 (incoming mail protocol), *158*
portable drives, 3
port assignments/port numbers, 157–158, *158*

Network Know-How
(C) 2009 by John Ross

ports
Ethernet, 4, 70–74, *71*, 85, 97, 193, 201, 216
FireWire, 4, 21, 205, 211
infrared, 21
input/output, 4
IrDA, 20–21, *21*
overview of, 28
parallel, 4, 16, 192, *192*, 194
TCP service, 158
USB, 4, 16, 21, 70, 73, 99, 192, 194, 195, 201, 205, 211, 212, 216
Port Scan Attack Detector, 159
POTS (Plain Old Telephone Service), 21–22
power converters, 61
Power LED indicator lights, 240
powerstrips, 61, *61*
PPTP (Point-to-Point Tunneling Protocol), 162, 163–164, 172
pre-assembled cables, 56
pre-shared key (PSK) mode, 182–183
printers
connecting to network, 191–201, *192–194*, *199–200*
servers, 7, 25, *25*, 193–197
sharing, 7, 143, *196*, 196–199, *198*, *199*
switches, 194–195
private folders, 5
protocols, 35–36, 115
PSK (pre-shared key) mode, 182–183
PTSN (Public Telephone Switched Network), 21–22
Public DNS servers, 41
public folders, 5, 139, *141*
public networks, VPN via, 173–174
Public Telephone Switched Network (PTSN), 21–22
PVC pipes, 58

Q

QuickTime, 218
Qwest, 174

R

radio, Internet, 209, 214
radio signals, 2, 4, 14, 16, 20, 69, 77, 79, 81, 85, 160, 174, 184
radio transmitter/receiver, 80, 81
RADIUS (Remote Authentication Dial-in User Service), 182, 183
RCA phone plugs, 218
Real Audio and Video, *158*, *210*
RealPlayer, 208, 218
RealVNC, 226, 229
Registered Jack, 70
remote
access, 226
conferencing, 205, 237
data entry, 224
desktop programs, 226–229, *227*, *228*
sensors and controls, 223–224, 232
terminals, 23, *23*
webcams, 204
Remote Authentication Dial-in User Service (RADIUS), 182, 183
Remote Desktop Connection Client, 226
reserved addresses, 37
restart options, 241–242
RG6/U cables, 65
rips, 208
RJ-11 telephone plugs/cables, 64–65, 70, *70*
RJ-45 plugs/jacks, 66–67, 70, *70*, 75, 193
Roku, 213
root servers, 40
Ross, John, *Wiring Home Networks*, 57
routed VPN traffic, 164
routers
combination boxes, 33
configuring, 86
gateway, 6, *6*, 32, 109–110
installing, 59, 61, 62–64, *63*
IP addresses, *38*
location of, 50
network-to-Internet connections, 109–115, 114
overview of, 32, *33*
rsync, 104
Ruska, Jimmy, 154

S

Samba operating system, 96
Samba Shares folder, *148*, 150
SATA hard drives, 97
scanning devices, 199–201, *200*
secondary switches, 53
second-level domains, *38*
Secure Shell (SSH), 104
Secure Sockets Layer (SSL), 89, 164, 176
security, network. *See* networks, security
selective backups, 100
serial data communications channels, 11

Network Know-How
(C) 2009 by John Ross

Series2
Dual Tuner DVRs, 216
Single Tuner DVRs, 216
Series3 HD DVRs, 216
Server Message Block (SMB) protocol, 131, 143, 145–147, *146*, 150
servers. *See also* file servers
2X Terminal Server, 226
Apache web server, 95, 156
audio/music, 7–8, 207–209, 212–213, *213*
audiophile music, 209
client-and-server structures, 23–25, *25*
computer for, 94
DHCP, 38, 109–115, *111*, *112*, 117–118, 124, 126, *126*, 129, 157–158, 163
DNS, 40–41, 42, 43–44, 109, 115, 118, 124, 127, 246
file storage, 24, 96–97
file transfer, 39
firewall, 24
game, 24
HTTP web, *158*
internal/external printer, *192*, 192–193
mail, 24
message, 234
printer, 7, 25, *25*, 193–197
Public DNS, 41
root, 40
stereo-component music, 208
types of, 24–25, *25*
USB device, 99, *99*, 100
video, 7–8, 215
VPN, 161, 162–165, *165*, 167–169, *168*
Windows Home Server, 95–96, *96*, 208, 215
server-side backup programs, 104
Service Set Identifiers (SSIDs), 86, 90, 177–179, *178*, 183, 244, 283
shared directories, 150
shared folders, 5, 139, *141*, 150
shared Internet connections, 6
Shared Key Security field, 180
shared printers, 7, 143, *196*, 196–199, *198*, *199*
shares, 139
sharing permissions, 96–97, *97*
shoulder surfing, 184
Silex Technology, 99
Simple File Sharing, *132*, 132–133, 136
Slim Devices, 213–214, *214*
"smart" home appliances, 223
SMB (Server Message Block) protocol, 131, 143, 145–147, *146*, 150
SMTP (outgoing mail protocol), *158*
sneakernets, 3–4
sniffer programs, 178, 179, 249
social engineering, 185
SoftRos Lan Messenger, 235
Sony PlayStation, 220–221
Sound Blaster, 208
sound cards, 205, 208, 211, 212
Sound Forge Audio, 208
sound quality, 208, 211, 213
sources, 206, 207
SQL, 95
Squeezebox devices, 213–214, *214*
SSH (Secure Shell), 104
SSIDs (Service Set Identifiers), 86, 90, 177–179, *178*, 183, 244, 283
SSL (Secure Sockets Layer), 89, 164, 176
standards, wireless network, *78*, 78–79
stars, 27
static addresses, 37, 109
status indicators, 75
stereo-component music servers, 208
stereo systems, 206, 212
storage servers, 24, 96–97
store-and-forward system, 11
structured wiring center, 59, 63
subdomain names, 39
subnet masks, 42, 109, 113, 118, 128
superusers, 226
surface boxes, 55–56
surveillance monitors, 205
S Video plugs, 218
switches
combination boxes, 33
designing networks with, 47
D-Link, *64*
downstream, 67
Ethernet, *30*, 53, *53*, 55, 62, 80, *193*
installing, 59, 61, 62–64, *63*
location of, 50
overview of, 28, *29*, 30–31, *31*, *33*
print, 194–195
secondary, 53
switching centers, 11
Symantec Security Check, 245
Synchronize It!, 232
SyncToy, 232
system administrators, 152
System Preferences window, *124*

Network Know-How
(C) 2009 by John Ross

T

TCO (total cost of ownership), 95
TCP. *See* transmission control protocol (TCP)
TCP/IP, 35–36, 123, *123*, 126, 158
telephones
  line connections, 17–18, 21–22, *22*, 64–65, *65*
  wall outlets, 48, 49, 51
  wiring, 17–18
telnet, 23, 39, *158*
Temporal Key Integrity Protocol (TKIP), 182–183
text messaging, 233
TightVNC, 226, 229
Time Machine, 103–104, *104*
TiVo, *216*, 216–217
TKIP (Temporal Key Integrity Protocol), 182–183
top-level domain names, 39–41, *40*
topologies, 27–28, *28*
total cost of ownership (TCO), 95
TraceRoute tool, 36, *44*, 44–46, *45*
`tracert`, 44
traffic monitors, 204
trailers, 11
transceivers, 80, 81
transmission control protocol (TCP), 35–36, 123, *123*, 126, 158
  service ports, 158
Trend Micro HouseCall, 245
TRENDnet, 161
Trillian, 234
troubleshooting
  AC power, 242
  configuration settings, 246
  defining problems, 240–241
  DHCP settings, 246
  error messages, 229, 239–240, 241, 247
  failed connections, 246–247
  general techniques, 239–245
  isolating problems, 243
  ISP problems, 251
  keeping calm, 251
  note keeping, 244–245
  operating systems, 240
  plugs and cables, 242
  restart options, 241–242
  retracing steps, 243
  settings and options, 243
  software for, 248–250, *249*, *250*
  viruses, 245
TrueCrypt, 185
tunneled virtual interfaces, 164
tunneling headers, 161–162
TV cable connections, 65–66
TVs, 206, 218–220
TWAIN interface, 201
twisted-pair cables, 15, *15*

U

UltraVNC, 229
uncompressed audio files, 209, 210
U-NII (Unlicensed National Information Infrastructure), 79
United States Computer Emergency Readiness Team (US-CERT), 189
uniterruptible power supply (UPS), 61
Unix
  backup files, 100, 104
  computer-to-network connections, 117, *127*, 127–129, *128*, *129*
  CUPS printer control program, 199
  file servers, 94–95, 96, 98, 215
  file sharing, 131, 147–150, *148–150*
  firewalls, 154–159, *155*, *158*
  network adapters, 73–74
  network-to-Internet connections, 115
  OpenVPN for, 173
  remote desktop programs, 229
  text commands for, 43, 44
  troubleshooting info, 247
  VPN clients for, 172-173
  VPN servers for, 164
  wireless control programs, 87
Unlicensed National Information Infrastructure (U-NII), 79
updates and patches, 185–188, *186–187*
UPS (uniterruptible power supply), 61
USB
  adapters, 72
  device servers, 99, *99*, 100
  flash drives, 121
  ports, 4, 16, 21, 70, 73, 99, 192, 194, 195, 201, 205, 211, 212, 216
  Wi-Fi adapters, 83–84, *84*, 85
US-CERT (United States Computer Emergency Readiness Team), 189
user accounts, 152

V

VGA
  connectors, 218
  displays, 220, 231

Network Know-How
(C) 2009 by John Ross

video
cables, 65–66
conferencing, 205, 237
files, 203–205, 215–220
messaging, 237
outlets, 48, 49, 50, 51
output drivers, 219
scaling, 219–220
servers, 7–8, 215
VideoLAN, 218
Virtual Network Computing (VNC), 226, 229
Virtual Private Network Consortium (VPNC), 162
Virtual Private Networks (VPNs)
built-in support, 164–165, *165*
client software for, 165–173, *166–172*
configuring servers for, 163–164
configuring Windows for, 165–172, *166–172*
data tunnels, 159, 161
functions of, 90, 159–161, *160*, *161*
messaging through, 236
methods, 161–162
OpenVPN, 164, 173
overview of and examples, 78, 90, 91, 159–174, *160*, *161*, *165*, *166*, *167*, *168*, *169*, *170*, *171*, *172*
via public networks, 173–174
servers, 161, 162–165, *165*, 167–169, *168*
viruses, troubleshooting, 245
VNC (Virtual Network Computing), 226, 229
Voice over Internet Protocol (VoIP), 54
VPNC (Virtual Private Network Consortium), 162
VPN Masquerade, 164
VPNs. *See* Virtual Private Networks (VPNs)

W

wall-mounted outlets, 59
wall plates, 49, *49*, 50, 52, 55–56, *56*, 67
WANs. *See* wide area networks (WANs)
WAV files, 209, *210*, 210–211
web browsers, 24, 174
webcams/cameras, 8, *204*, 204–205, 237
web hosting services, 105
WEP (wired equivalent privacy) encryption, 90, 91, 174–175, 176, 179–182, *181*, 183, 217
WIA interface, 201
wide area networks (WANs)
computer-to-network connections, 117
connections to, 24
network-to-Internet connections, *108*, 109–113, 115
overview of, 31–32, *32*, 45
Wi-Fi (wireless fidelity)
hotspots, 77–78, 89
links, 19–20, 194, 211, 213, *213*, 215, 217, 224
networks
access points, 16, 53, 55, 62, 80–81, *81*, 85–86, 87, 90, 99, 111, 113, 174
antennas, 4, 80, *82*, 84–85
configuring, 85–86
connection programs, 85, 87–89
control programs, 85–86, 87–88, *88*
designing/planning for, 54
enhanced/extreme systems, 78–79
firewalls for, 154–159, *155*, *158*, 172
hybrid wireless networks, 89
network interface adapters, 81–85, *82*, *83*, *84*, 85, 87
network standards, *78*, 78–79
operating channels, 79–80, *80*, 86
overview of, 16, 77–78
planning for, 50
security methods, 54, 89–92, 174–184, *175*, *178*, *181*
types of, 16, 78–79
Wireless Network Connection programs, *87*, 87–89, *88*
wireless settings, 86
pigtails, 85
printer servers, 194
Wi-Fi Alliance, 79
Wi-Fi Protected Access (WPA) encryption, 54, 78, 90, 91, 136, 160, 174–176, 179, 181, 182–183, 194, 217
Wii, 220, 221
WiMAX networks, 174
Windows
backup files, 100–103, *101*, *103*, 104
Backup or Restore Wizard, *101*, 101–102
computer connections, 22
computer-to-network connections, 117, *118*, 118–124, *119*, *120*, *121*, *122*, *123*

Network Know-How
(C) 2009 by John Ross

Windows, *continued*
configuring for VPN, 165–172, *166–172*
file servers, 94–96, *96*
file sharing in Vista, 131, 136–143, *137–142*
file sharing in XP, 131, *132*, 132–136, *134*, *135*
firewalls, 154–159, *155*, *158*
Home Server, 95–96, *96*, 208, 215
infrared ports, 21
IP addresses, *111*, 111–112
Live Messenger, 234–235, *237*
Media Audio, *210*
Media Center, 208
Media Player, 208, 211, 218
network adapters, 73–74
Network Problem Solver, 245, *247*, 247–248
network profiles, 118
Network Setup Wizard, 118–122, *119*, *120*, *121*
network-to-Internet connections, *111*, 111–112, *112*, 115
OpenVPN for, 173
Remote Desktop, 226
remote desktop programs, 226–229, *227*, *228*
servers, 163–164, 215
TCP/IP, 35–36, 123, *123*, 126, 158
text commands for, 43, 44
troubleshooting info, 247
updates and patches, 185–188, *186–187*
Vista Home Premium, 226
VPN servers for, 162–165, *165*
Wi-Fi control programs, *87*, 87–88, *88*
Windows-to-Mac remote access, 226
wired equivalent privacy (WEP) encryption, 90, 91, 174–175, 176, 179–182, *181*, 183, 217
wired networks, connecting to, 216–220
wireless
Ethernet. *See* Wi-Fi (wireless fidelity)
gateway firewalls, 158
network names, 86
network standards, *78*, 78–79
security, 54, 89–92, 174–184, *175*, *178*, *181*
wireless fidelity. *See* Wi-Fi (wireless fidelity)
Wireless Network Connection programs, *87*, 87–89, *88*, 122
Wireshark, 248, 249, *250*
wiring
Ethernet, 17
home run, 51–52, *52*, 53
installing, 16–18, 57–58, *66*
modular structured wiring center, 59, 63
telephone, 17–18
wiring closets, 31, 50
Wiring Home Networks (Ross), 57
workgroup names, 145
World Wide Web Consortium, 24
WPA (Wi-Fi Protected Access) encryption, 54, 78, 90, 91, 136, 160, 174–176, 179, 181, 182–183, 194, 217
WPA2 encryption, 90, 176

X

Xbox 360, 220, 222
X Display Manager Control Protocol, 226
XMBC Media Center, 208

Y

yahoo.com, 44
Yahoo! Messenger, 234–235

Z

ZoneAlarm, 158
Zune, 24

Network Know-How
(C) 2009 by John Ross