Index

Note to the Reader: Throughout this index boldfaced page numbers indicate primary discussions of a topic. Italicized page numbers indicate illustrations.

A

Administrator account passwords, 517

Above Normal process priority, 38

access

denied, 561

printers, 294–295

unauthorized, 573

access control lists (ACLs)
description, 484

VLANs, 97

access lists for entry, 472

access points (APs)
description, 67

SOHO networks, 72, 531–532

accessories for mobile devices, 36–39, 37–38

accounts

disabling, 519

laptops, 201

managing, 375, 408, 516, 519, 518

POP, 42–43

recovery options, 595

setup, 201

unauthorized access, 573

ACLs (access control lists)
description, 484

VLANs, 97

acronyms, 613–614

action plans in problem solving, 257

Active Directory (AD)

accounts, 517–519, 518

concepts, 475–476

active heat sinks, 178

active hubs, 68

active listening, 614

active matrix screens, 16

active reader/active tags (ARATs), 84–85

active reader/passive tags (ARPTs), 84–85

AD (Active Directory)

accounts, 517–519, 518

concepts, 475–476

ad hoc printers, 204

adapters

DVI to HDMI, 134, 135

DVI to VGA, 136, 137

USB to Ethernet, 135, 137

add-on video cards, 180, 180

Add/Remove Programs, 416

address bus, 171

ADF scanners, 184

ADMS drive, 429

administrative shares

vs. local, 511

networking configuration, 429

administrative tools, 373–378

Administrator account passwords, 517

security settings, 505–506

ADSL (asymmetric DSL), 76

Advanced Encryption Security (AES)description, 487

SOHO networks, 81

Advanced Micro Devices (AMD) CPUs, 174, 176

Advanced Security tool, 375

Advanced tab

Internet Options applet, 405–406, 406

System utility, 412–413, 412

Advanced Technology Extended (ATX) form factor, 160, 160

motherboard power supplies, 190, 190, 193, 193

Aero interface, 328

AES (Advanced Encryption Security) description, 487

SOHO networks, 81

AFP (Apple Filing Protocol), 64

AGP video cards, 180, 180

AIK (Automated Installation Kit), 344

air filters, 603, 606

airborne particles, 605–606

airplane mode configuring, 40

settings, 23, 24

AirPrint technology, 207

alerts, security, 559

Allow permissions limitations, 508

Allow Remote Access To Your Computer option, 433

Allow Remote Assistance Connections To This Computer option, 435

Allow Remote Assistance Invitations To Be Sent From This Computer option, 434

alternative IP addresses, 437–438, 438

Always Show Icons, Never Thumbnails option, 410

Always Show Menus option, 411

AMD (Advanced Micro Devices) CPUs, 174–176

answer files in OS upgrades, 341

antennas connectors and placement, 17–18

SOHO networks, 511, 532

antistatic bags, 597–598

antistatic mats, 598–599

antistatic wrist straps, 597–598, 598

antivirus software, 496

mobile devices, 523

overview, 478

rogue, 560

SOHO networks, 75

updates, 445

Anytime Upgrade, 341

APIPA (Automatic Private IP Addressing) overview, 92

troubleshooting, 299–300

App History tab in Task Manager, 384, 584

Apple Filing Protocol (AFP), 64

appliances

firewalls, 479

Internet, 88–90

application-level proxy functions, 480

application logs

Event Viewer, 375

malware clues in, 561

mobile devices, 570

problem solving, 256

applications

cloud computing, 240–241, 241

compatibility, 350

configuring, 201

crashes, 549, 560

disabling, 555, 555

installation, 424–426

mobile devices, 567

not loading problems, 284

repairing, 553

software requirements, 53

SOHO networks, 75

synchronizing, 51

thick clients, 198

Applications tab in Task Manager, 383, 583

approvals in change management, 589

apps in cloud computing, 240

APs (access points)
description, 67

SOHO networks, 72, 531–532

apt-get command, 458

ARATs (active reader/active tags), 84–85

archives, 445

armored viruses, 493

ARPTs (active reader/passive tags), 84–85

arrays, adding, 396

artifacts, video, 274

asset tags in inventory management, 587

assignments in port forwarding, 78

asymmetric DSL (ADSL), 76

AT Attachment (ATA) drives, 131, 132, 131–132

AT motherboards power supplies, 190, 190

ATAPI (ATA Packet Interface), 133

attributes, file, 508–509

ATX (Advanced Technology Extended)

form factor, 160, 160

motherboard power supplies, 190, 190, 193, 193
audio connectors, 166, 166
editing workstations, 195–196
mobile devices, 287
sound cards, 180, 181, 197
augmented reality, 29–30, 29–30
AUPs (acceptable use policies), 584–585
authentication
limited connectivity, 547
mobile devices, 53, 523–524
multifactor, 482
networks, 297
passwords, 481–482
servers, 88
shared devices, 207
single sign-on, 512
wireless, 487–488
authenticators
applications, 524
RADIUS, 489
auto duplex settings in NICs, 439, 439
autocertified IP addresses, 94
Automated Installation Kit (AIK), 344
Automatic Private IP Addressing (APIPA)
overview, 92
t麻leshooting, 299–300
Automatically Type Into The Search Box option, 411
automobiles, synchronizing to, 50
AutoRun function, disabling, 519
autotuning NICs, 181
availability, print, 295

B
back-side bus (BSB), 171
backed-up print queues, 294
backlight, keyboard, 21
backout plans in change management, 589
backups and recovery
disaster recovery, 497–499
MacOS and Linux, 445, 446
remote, 522 523
scheduled, 442, 590–593
surge protectors, 594–595, 594–595
UPSs, 593 594
bad pixels, 274
badge readers, 471
barcodes
in inventory management, 587
scanners, 184
bare-metal backups, 592
barriers, 472
baseband updates, 47–48
Basic Input/Output System (BIOS)
IDE drives, 155
NICs, 440
passwords, 168, 515
settings, 167, 171, 170 171
time and setting resets, 261
basic partitions, 345
.bat files, 619
batteries
charging problems, 280
CMOS, 171, 172
mobile devices, 37, 38, 286–288
recycling, 599–600
replacing, 13
short life, 568
simulated battery pulls, 284
UPSs, 593–594
Bayonet Neill–Concelman (BNC) connectors, 121, 138, 138
BD-R format, 149
BD-RE format, 149
beeps in POST, 259–260
Below Normal process priority, 385
belts in inkjet printers, 221
bias voltage in laser printers, 215
biometric authentication, 523
biometric locks, 473
BIOS. See Basic Input/Output System (BIOS)
BitLocker, 327, 513
BitLocker Drive Encryption, 423, 423
BitLocker To Go, 513
black lines on printed page, 293–294
black screens, 549
blacklistings, 79
blackouts, 593
blank pages
laser printers, 219
printing, 296
blank screens on bootup, 260
Blu-ray standard, 148–149
Blue Screen of Death (BSOD), 263–264, 271, 549
Bluetooth
configuration, 40–42
connectivity issues, 282, 565 566
function keys, 21
module replacement, 11 12
pairing issues, 572
printers, 204
versions, 35
BNC (Bayonet Neill–Concelman) connectors, 121, 138, 138
Bonjour technology, 207
bookmarks, synchronizing, 52
Boot Camp utility, 453, 454
Boot tab in MScConfig tool, 379, 379
BOOTP (Bootstrap Protocol), 94
Bootrec.exe tool, 554
bootup
blank screens on, 260
hard drive failures, 270
to incorrect devices, 261
methods, 339–340
order, 554
safe, 555–556
settings, 167
slow, 550
troubleshooting, 547–548
buttons, 495
BranchCache, 327
bridges, 69
brightness
projectors, 187
screen, 20–21
bring-your-own-device (BYOD) initiatives, 526
brownouts, 593
browser redirection, 559
brute-force attacks, 503
BSB (back-side bus), 171
BSOD (Blue Screen of Death), 263–264, 271, 549
burn-in, video, 276–277
burning smell, 263
tbus speed setting, 171
business processes in change management, 588
BYOD (bring-your-own-device) initiatives, 526

C
Cable Select setting in IDE drives, 155, 156
cable strippers, 103, 105
cables
hard drives, 131, 134, 131, 132, 134
mobile devices, 288
multipurpose, 127–130, 128–130
network, 120–124, 122–125
patch, 69, 69
peripherals, 130–136, 131–132, 134 136
safety procedures, 602
testers, 104
t麻leshooting, 300–301
video, 124 127, 124 126
caches
buses, 171
hard drives, 207
CAD (computer-aided design) workstations, 194–195
calendars, synchronizing, 52
calibration
inkjet printers, 222–223
laser printers, 220
CAM (computer-aided manufacturing) workstations, 194–195
cameras
description, 187
security, 75 76
unauthorized, 573

capacitors, distended, 267–268, 267
carriages in inkjet printers, 221 222
cartridges for inkjet printers, 221
Cat 5 cable, 121
Cat 5e cable, 121
Cat 6 cable, 121
CCMP (Cipher Block Chaining Message Authentication Code Protocol), 81
cd command
Linux, 455
Windows, 353
CD-ROM
booting from, 339
overview, 148
CD-ROM File System (CDFS) – Control Panel utilities

overview, 237
printing, 205
rapid elasticity, 239
resource pooling, 239
review questions, 246–247
shared resources, 238–239
storage, 595
synchronization apps, 240
virtual application streaming, 240–241, 241
cmdk command, 457
CMOS (complementary metal-oxide semiconductor)
batteries, 171, 172
chips, 598
CMOS Setup program, 168–169
coaxial cable, 123–124, 123
cold docking level, 24
collate settings for printers, 203
color
printing problems, 295
troubleshooting, 275
Color depth settings, 407, 408
command line tools
cd, 353
chdsk, 362–363
copy, 366–367
dir, 352–353
diskpart, 363
dism, 361
format, 365–366
gresult, 364
gpupdate, 364
ipconfig, 354–355, 354–355
net use, 369
net user, 370
netstat, 358–359, 358
nslookup, 359–360
overview, 351–352
ping, 355–356, 356
question mark, 371
robocopy, 368
runas, 371
sfc, 361–362
shutdow, 361
taskkill, 363
tracert, 356–357, 357
xcopy, 367–368
COMMAND utility, 398
comments in scripts, 620
commercial software, 611
Common Internet File System (CIFS)
description, 64
NFS, 347
common ports, 62–65
common symptoms
troubleshooting, 258–268, 265–267
video troubleshooting, 272–278, 276–277
communication techniques and
professions, 613
active listening, 614
cultural sensitivity, 614
customer dealings, 617–619
distractions, 615–617
proper language, 613–614
punctuality, 615
community clouds, 238
Compact Flash (CF) cards, 153, 154
companion viruses, 493
compatibility
applications, 425
CPUs, 174–178, 177
operating systems, 322, 324, 338, 350
complementary metal-oxide semiconductor
(CMOS)
batteries, 171, 172
chips, 598
compliance
documentation, 584
environmental regulations, 607
safety procedures, 603
component handling and storage, 597–599, 598–599
Component Services tool, 374
compressed air, 606–607
customer-aided design (CAD) workstations, 194–195
customer-aided manufacturing (CAM)
workstations, 194–195
Computer Management tool, 373
concentrators in VPNs, 96
conditioning step in laser printers, 214, 214
confidence, 614
confidential materials, 618–619
Connect To a Workplace option, 432
Connect To The Internet option, 431
connections
mobile devices, 31–35, 32–33
networking, 99–101, 431, 432
Connections tab in Internet Options applet, 401, 401
connectivity
imintern, 300
Intranet, 559
laser printers, 219
limited, 547
networks, 297–300
printing, 293
thin clients, 199
troubleshooting, 282
wireless, 565–566
connectors
common, 136–141, 137–138, 141
motherboards, 162–167, 162–166
power supplies, 191–194, 191–193
constructs for scripts, 620–621
contacts, synchronizing, 51
content filtering in SOHO networks, 534
continuous feed printers, 209
continuous reboots, 261
Control Panel utilities
BitLocker Drive Encryption, 423, 423
Credential Manager, 416, 416
Device Manager, 422, 423
Devices And Printers, 418, 419
Display, 406–408, 407–408
folder settings, 408–411, 409–410
HomeGroup, 417–418, 418
Internet Options, 400–406, 401–406
Network and Sharing Center, 421, 422
overview, 400
controllers in laser printers – documentation

power options, 415–416
Programs and Features, 416, 417
Sound, 419, 420
Sync Center Control, 424, 424
System, 411–413, 412–414
Troubleshooting, 420–421, 421
user accounts, 408
Windows Firewall, 414, 414

controllers in laser printers, 210
cooling
CPUs, 178–179
gaming PCs, 197, 197
copy command, 366–367
copier folders and files, 508
cores
CPUs, 172
virtualization workstations, 196

corporate email configuration, 42–47

cp command, 456

CPUs, 172
compatibility, 174 178, 177
cooling, 178–179
cores, 172
gaming PCs, 196
GPUs, 174
hyperthreading, 173
replacing, 15
socket types, 174 178, 177
speeds, 173–174
virtual technology, 173
workstations, 195 196


crash screens, 263–264, 271


crashes, application, 201, 549, 560
creased paper in printing, 291
Credential Manager, 416, 416
credit card readers, 38, 38

crimpers, 103
critical applications, backups for, 593
CRT monitor disposal, 600–601
cultural sensitivity, 614–615
cursors, ghost, 280
customers, dealing with, 616–619
cylinders
hard drives, 150, 150
laser printers, 215

D

daisy chaining, 130
dark spots with laser printers, 219
Data_Bus Error message, 264
data destruction and disposal
physical destruction, 527–529
recycling, 529–530
data loss prevention (DLP), 484
data preservation in incidents, 608–609
data privacy, 207–208
Data Sources tool, 374
data speeds for mobile devices, 572
data transmissions, over limit, 573
data types in scripts, 621
date settings, 349
DB-9 connectors, 139
DC jacks, replacing, 13
dd command, 459
DDoS (distributed denial-of-service) attacks, 502
DDR (Double Data Rate) memory, 143–144
DDR2, 143
DDR3, 143
DDR4, 143
dead pixels, troubleshooting, 274
debits
removing, 606–607, 606–607
thermal printers, 224
decryption problems in email, 285, 568
default SSDs, 531
default subnet masks, 91–92, 95
Defrag tool, 399
defragmenting drives, 551, 551
degaussing for data destruction, 528
deleting AD accounts, 518
demilitarized zones (DMZs), 77–78
denial-of-service (DoS) attacks, 503
Deny permissions limitations, 508
dependencies in services, 550, 550
desktop
cloud computing, 241, 241
configuring, 200 201
MacOS and Linux, 450–451, 451
synchronizing to, 50
thick client applications, 198

Windows operating systems, 328–332
destination network address translation (DNAT), 98

details tab in Task Manager, 389, 390
developing step in laser printers, 215, 215
Device Manager, 373, 422, 423
Devices And Printers applet, 418, 419
DHCP. See Dynamic Host Configuration Protocol (DHCP)
dial-up connections
overview, 99
uses, 431
dictionary attacks, 503
differential backups, 499, 592
difficult customers, 616
digital rights management (DRM), 610
Digital Subscriber Line (DSL) modems, 68–69, 76–77

Digital Video Interface (DVI), 126, 126
digitizers, 18, 191
dim images, 275, 279, 565
DIMMs (dual inline memory modules) circuit boards, 145
description, 141–142, 142
dir command, 352–353
Direct Memory Access (DMA) channels, 156
directories. See folders

disabling
AD accounts, 519
airplane mode, 23
applications, 555, 555
AutoRun function, 519
guest accounts, 516
Num Lock, 282
ports, 476–477, 534
services, 555
SSID broadcasts, 81, 302, 487, 531
touchpads, 21
Windows firewalls, 437
disappearing files, 560–561
disassembling mobile devices, 288
disaster prevention and recovery methods, 497–499, 590–593

Disk Management tool
adding drives, 396
arrays, 396
drive letters, 395, 395
drive status, 391–392, 391
extending partitions, 394
IDE drives, 156
initializing drives, 392–393, 393
mounting drives, 392
overview, 390–391
shrinking partitions, 394–395, 394–395

splitting partitions, 394
storage spaces, 396–398, 396–397
diskpart command, 363
disks. See also drives
imaging, 343
mirroring, 157, 157
striping, 156–157, 157
wiping, 528
dism command, 361

Display applet
Color depth settings, 407, 407–408
refresh rate, 408, 408
resolution settings, 406
Display File Icon On Thumbnails option, 411
Display File Size Information Folder Tips option, 411
DisplayPort standard, 125–126, 126
displays. See also screen
laptops, 15
dual, 20
types, 16–17
mobile devices, 565
distended capacitors, 267–268, 267
distorted video geometry, 276, 276
distorted video images, 276
distractions, 615 617
distributed denial-of-service (DDoS) attacks, 502
Distributed mode in BranchCache, 327
DLP (data loss prevention), 484
DMA (Direct Memory Access) channels, 156
DMZs (demilitarized zones), 77 78
DNAT (destination network address translation), 98
DNS. See Domain Name System (DNS)
DNSSEC (Domain Name System Security Extensions), 499
Dock, 453, 453
docking stations, 24 25
documentation, 582
acceptable use policies, 584–585
change management, 589
customer services, 618
incidents, 583, 610
inventory management, 586–587
knowledge base/articles, 585
mobile devices, 288
domain, 499
domains
access in Windows, 327
Active Directory, 475
setup, 349, 427–428, 428
Don’t Show Hidden Files, Folders, And
Drivers option, 409
door locks
IoT-enabled, 76
overview, 472
DoS (denial-of-service) attacks, 303
dot-matrix printers, 224–226
double data rate (DDR) memory, 143–144
DDR2, 143
DDR3, 143
DDR4, 143
drills for data destruction, 528
drive letters, assigning and changing, 395

Drivers
appropriate, 202–203
installing, 349
rolling back, 552
third-party, 348–349
updates, 443–444

Drivers
activity lights, 167
adding, 396
application space requirements, 425
cryptographic, 168–169
flash, 152–154, 152–154, 339
formatting, 348, 529
fragmented, 551

hard. See hard drives
imaging, 343
MacOS and Linux, 447
mapping, 429
overwriting, 529
recycling, 529–530
scheduled maintenance, 442
SSDs, 10, 149, 339
wipes, 528, 530

DRM (Digital Rights Management), 610
dropped signals, 571
drums in printers, 210
dSL (Digital Subscriber Line) modems, 68–69, 76–77
dual channel RAM, 144, 144
dual-core CPUs, 172
dual displays for laptops, 20
dual-homed firewalls, 480, 481
dual inline memory modules (DIMMs)
circuit boards, 145
description, 141–142, 142
dual monitors for workstations, 196
dumpster diving, 502
duplex settings
NICs, 439, 439
printers, 203
duplexing
inkjet printers, 221
laser printers, 218
dust
removing, 606–607, 606–607
thermal printers, 224
DVD, booting from, 339
DVD-ROM standard, 148
DVI (Digital Video Interface), 126, 126
DVI to HDMI adapters, 134, 135
DVI to VGA adapters, 136, 136
DXDIAG utility, 399
dye sublimation in thermal printers, 224
Dynamic Host Configuration Protocol
(DHCP)
description, 64
IP addressing, 93–94
servers, 87
troubleshooting, 299–300
dynamic IP addresses, 92
dynamic partitions, 345

environmental
impacts, 603–604
airborne particles, 605
606
dust and debris, 606–607, 606–607
government regulations, 607
MSDS documentation, 604
power-related threats, 605
printers, 209
temperature, humidity, and ventilation, 604–605
EP (electrophotographic) printers. See laser printers

eph (electronic protected health information), 612
equipment grounding, 596–597
e-readers, 30
Ebooks, 30
synchronizing, 52
ECC (Error Correction Code) RAM, 145
Eeprom (electrostatically erasable
programmable read-only memory) chips, 167
EFS (Encrypting File System), 327–328,
328, 513, 513
802.11a standard, 82–83, 204
802.11ac standard, 83
802.11b standard, 83
802.11g standard, 83
802.11n standard, 83
eight-pin 12V power supplies, 192, 192
electrical fire safety, 602
electrostatically erasable programmable read-
only memory (EEPROM) chips, 167
electromagnets for data destruction, 528
electronic protected health information
(EPHI), 612
electrophotographic (EP) printers. See laser printers

electrostatic discharge (ESD), 596–597
antistatic bags, 597–598
ESD mats, 598, 599, 599
ESD straps, 598, 598
email
cloud computing applications, 240
configuring, 42

description problems, 285, 568
Exchange, 46–47
filtering, 484
Google, 46
hijacked, 561
iCloud, 45–46
IMAP, 43
mail servers, 88
POP accounts, 42–43
S/MIME, 44–45
synchronizing, 51
troubleshooting, 299
viruses, 492, 492
Yahoo, 47
embedded systems, 90
emulator requirements for virtual machines, 243

eventing
airplane mode, 23
multimonitor taskbars, 330, 331
Num Lock, 282
RDP, 433–435, 433–435, 622–623,
622–623
Windows firewalls, 437
workspaces, 451
enclaves for airborne particles, 605
Encrypted File System (EFS), 327–328,
328, 513, 513
encryption
BitLocker, 513
BitLocker Drive Encryption, 423, 423
data privacy, 208
drives, 168–169
mobile devices, 524
SOHO networks, 80, 81, 531
Windows operating systems, 327–328,
328, 513, 513
wireless, 486
workstations, 519
end-of-life date for operating systems, 324
end-point management servers, 90
end-user acceptance in change management,
589
end-user device configuration in SOHO
networks, 74–75
end-user education for malware, 499
end-user license agreements (EULAs), 610
enterprise licenses, 611
entry control rosters, 474
environmental variables in scripts, 620
environmental changes in problem
solving, 255
environmental impacts, 603–604
airborne particles, 605
606
dust and debris, 606–607, 606–607
government regulations, 607
MSDS documentation, 604
power-related threats, 605
printers, 209
temperature, humidity, and ventilation, 604–605
EP (electrophotographic) printers. See laser printers

eph (electronic protected health information), 612
equipment grounding, 596–597
error codes in printing, 219, 296
Error Correction Code (ECC) RAM, 145
eSATA cables, 132, 132
connectors, 140
expansion cards, 182, 182
ESD (electrostatic discharge), 596–597
antistatic bags, 597–598
ESD mats, 598–599, 599
ESD straps, 598, 598
Ethernet cables, 121–122, 122
NICs, 181
PoE, 70, 70
printers, 204
USB to Ethernet adapters, 135, 135
Ethernet over Power, 70, 71
EULAs (end-user license agreements), 610
Event Viewer, 375–378, 376–377
exceptions in firewalls, 436
Exchange email, 46, 47
exFAT (Extended File Allocation Table), 346
ext rollers, troubleshooting, 292
expansion cards eSATA, 182, 182
NICs, 181
sound, 180
USB, 181 182
video, 179–180, 180
expectations, customer, 617–619
expiration, passwords, 515, 586
EXPLORER utility, 399
exposing step in laser printers, 214, 214
ExpressCard slots, 11
ext3 file system, 347
ext4 file system, 347
Extended File Allocation Table (exFAT), 346
extended reality, 29–30, 29–30
extended partitions, 345, 394
extensions settings, 409, 409
external caches, 171
external data bus, 171
external drives, booting from, 340
external monitors for mobile devices, 282, 566
external shared resources in cloud computing, 239
external speed in CPUs, 173

F
F connectors, 121
failed printing, 291
failed attempts
lockout, 516, 517
restrictions, 523
failed jobs in logs, 277
false acceptance rate (FAR) in biometric locks, 473
false rejection rate (FRR) in biometric locks, 473
fans for CPUs, 178
FAT (File Allocation Table)
limitations, 507
overview, 346–347
feeders
inkjet printers, 221
thermal printers, 223–224
fencing, 472
fiber-optic cabling
characteristics, 122–123, 123
overview, 99
Fiber to the Home (FTTH), 99
fifth generation (5G) cellular technology, 86
File Allocation Table (FAT)
limitations, 507
overview, 346–347
file servers, 87
file systems, 346–348
File Transfer Protocol (FTP), 63
files
attributes, 508–509
backups, 592–593
disappearing, 560–561
moving and copying, 508
permission changes, 561
printing to, 226
script, 619, 620
shared, 510, 512, 510, 511
sharing, 199, 626
system, 512
filters
air, 603, 606
content, 354
eMail, 484
MAC addresses, 79, 477
Finder, 452, 452
fingerprint locks, 521
fire-rated storage, 498
fire safety, 602
firewalls
configuring, 437
description, 67, 375
enabling and disabling, 437
exceptions, 436
malware, 499
managing, 414, 414
mobile devices, 525–526
overview, 478, 479, 479
packet-filter, 480
proxy, 480, 481, 481
SOHO networks, 75, 77, 80, 533
stateful inspection, 481
firmware
radio, 48, 49
SOHO networks, 534
updates, 167, 443–444, 534
first response in incidents, 609–610
fitness monitors, 28, 28
SAS/SATA cable, 122, 122
flash drives
booting from, 339
overview, 152–154, 152–154
flash memory for mobile devices, 39
flashing BIOS, 167
flattened scanners, 184
flickering images, 275, 279
fluorescent backlighting, 16–17
Finder Options dialog box, 408
General tab
Folder Options, 410, 410
Internet Options, 402–403, 403
MSConfig tool, 378, 378
generalization process in operating system images, 343
geometric video distortion, 276, 276
gestures, 452

G
Gadgets, 328
game controllers, 186, 186
game pads, 36, 37
gaming PCs, 196–197, 197
garbled characters in printing, 219, 293
gateways
alternative IP addresses, 438
IP addressing, 91, 96
troubleshooting, 298
General Data Protection Regulation (GDPR), 611–612
General tab
Folder Options, 410, 410
Internet Options, 402–403, 403
MSConfig tool, 378, 378
GFCI (ground fault circuit interrupter) receptacles – imaging process in laser printers

GFCI (ground fault circuit interrupter) receptacles, 395
ghosted images in printing, 219, 291
Gigabit NIC, 199
global positioning system (GPS) mobile devices, 287
overview, 31
settings, 22–23, 23
Global System for Mobile Communications (GSM), 100
goggles, 602
Google email, 46
Google Glass, 29, 29
government regulations environmental impacts, 607
safety procedures, 603
grepresult command, 364–365
GPS (global positioning system) mobile devices, 287
overview, 31
settings, 22–23, 23
GPT (GUID Partition Table), 346
grep update command, 364
graphic workstations, 194 195
graphics processing units (GPUs)
gaming PCs, 197
integrated, 174
graylisting, 79
grep command, 454–455
ground fault circuit interrupter (GFCI) receptacles, 395
grounding equipment, 596–597
self-grounding, 599
group policies for Active Directory, 475–476
GSM (Global System for Mobile Communications), 100
guards, 472
guest accounts disabling, 516
security settings, 506
guest operating systems in virtualization workstations, 196
GUID Partition Table (GPT), 346

H
half duplex settings in NICs, 439, 439
hammers for data destruction, 528
hard drives cables, 131–134, 131–132, 134
networks, 131–132, 134
hard drives, 131–134, 131–132, 134
spaces, 131–132, 134
hard drives, 131–134, 131–132, 134
caches, 207
configuring, 155–156, 156
magnetic, 149–151, 150
managing. See Disk Management tool partitioning. See partitions, hard drives replacing, 9–10
troubleshooting, 268 272
workstations, 195–196
hardware adapters, 134–136, 135 136
BIOS/UEFI settings, 167 171, 170 171
CMOS battery, 171, 172
compatibility, 350
connectors, 136 141, 13 138, 141
CPU features, 172–179, 177
desktop, 200–201
expansion cards, 179–183, 180–182
PCs, 196–197, 197
hard drive cables, 131–134, 131–132, 134
laptops, 201–202
motherboards
connectors types, 162–167, 162–166
form factors, 160–162, 160–161
networked, 203–205
public devices, 205–208, 205–206
RAM, 141–147, 144, 146
review questions, 228–233
storage devices, 147–159, 150, 152 154, 156 158
thick clients, 198
thin clients, 198–199
video cables, 124 127, 124–126
workstations, 194 196
hardware/device replacement in laptops. See laptops
hardware tokens, 473
HCl headset computer, 30
HDMI (High-Definition Multimedia Interface)
connectors, 125 125
DVI to HDMI adapters, 134, 135
HDSL (high-bit-rate DSL), 76
heads
hard drives, 150
inkjet printers, 222
headsets
description, 187
mobile devices, 36
virtual reality, 29 30, 29–30, 184, 185
Health Insurance Portability and Accountability Act (HIPAA) Security Rule, 612
healthy drive status, 391
heat sinks, 178–179
heating elements in thermal printers, 223 224
HFS (Hierarchical File System), 348
Hibernate power option, 415
hidden files settings, 409, 409
Hide Empty Drives In The Computer Folder option, 411
Hide Extensions For Known File Types option, 409
Hide Protected Operating System Files option, 409, 411
Hierarchical File System (HFS), 348
high-bit-rate DSL (HDSL), 76
High-Definition Multimedia Interface (HDMI)
connectors, 125 125
DVI to HDMI adapters, 134, 135
high-end video workstations, 195
High process priority, 385
High-Voltage Power Supply (HVPS) in laser printers, 213
hijacked email, 561
HIPAA (Health Insurance Portability and Accountability Act) Security Rule, 612
home folders, 476
home network settings, 435
HomeGroup settings, 417–418, 418
vs. workgroups, 427
host cursors, 280
Hosted Cache model, 327
hosted VDI model, 241
hostnames in IP addressing, 93
hosts
services, 86–90
virtualization workstations, 196
hot docking level, 24
hot-swappable drives
booting from, 340
description, 158
hotfixes for workstations, 520
hotspots
configuring, 40
mobile devices, 35, 100
HTTP (Hypertext Transfer Protocol), 63
HTTPS (Hypertext Transfer Protocol over Secure Sockets Layer), 64
hubs, 68
humidity control, 605
HVPS (High-Voltage Power Supply) in laser printers, 213
hybrid clouds, 238
hybrid drives, 10, 151, 152
Hypertext Transfer Protocol (HTTP), 63
Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS), 64
hyperthreading, 173
hypervisors, 173, 244–245, 244–245

I
IaaS (infrastructure as a service), 238
iCloud
description, 452
e-mail, 45–46
synchronizing to, 50
ICMP (Internet Control Message Protocol), 481
icons, oversized, 277, 277
ID badges, 472
IDE drives
configuring, 155 156, 156
overview, 132–133, 132
IDs in SCSI, 134
IDSs (intrusion detection systems), 89
ifconfig command, 457
image-level backups, 592
images
operating systems, 343–344, 552
printing to, 226
recovery in MacOS and Linux, 447
ImageX utility, 343
imaging drum in laser printers, 211, 211
imaging process in laser printers, 214–217, 214–217
IMAP (Internet Message Access Protocol) – laser printers

Internet Control Message Protocol (ICMP), 481
Internet Message Access Protocol (IMAP) description, 64
e-mail, 43
In-Plane Switching (IPS) displays, 16
incident response plans (IRPs), 610
incident documentation, 583
incident response, 608–610
incineration for data destruction, 528
incorrect color patterns, 275
incorrect devices, boot to, 261
incremental backups, 498, 592
indicators, 263, 282
Information Technology eXtended (ITX) motherboards, 161, 161
infra-red (IR) connectors, 35
infrastructure
changes, in problem solving, 255
printers, 204
infrastructure as a service (IaaS), 238
inheriting permissions, 512
initializing drives, 392–393, 393
injectors, PoE, 70, 70
inkjet printers, 220–223, 220
input voltages in power supplies, 189–190
installation
applications, 424–426
drivers, 349–350
operating systems, 340–344
printers, 295
RAM, 145–147, 146
integers in scripts, 621
integrated commercial provider email configuration, 45–47
integrated print servers, 204–205
Integrated Services Digital Network (ISDN), 100
Intel CPUs, 176
interface
configurations, 169, 171, 170
Windows operating systems, 328–332, 329, 331
interference, 300–301
intermittent connectivity, 300
intermittent device failure, 262
intermittent wireless, 280, 565
internal drives, booting from, 340
internal shared resources in cloud computing, 239
internal speed in CPUs, 173
internal USB connectors, 166, 166
International Mobile Equipment Identification (IMEI), 49
International Mobile Subscriber Identification (IMSI), 49
Internet appliances, 88–90
Internet connections
issues, 559
networking, 99–101
IP addressing
alternative, 437, 438, 438
APIPA, 92
classes, 91, 92
conflicts, 301
DHCP, 93–94
DNS, 93
gateways, 96
IPv4 vs. IPv6, 94–95
link local, 93
NAT, 97, 98
overview, 90–91
printers, 429, 430
SOHO networks, 73, 533
subnet masks, 95–96
VLANs, 97
VPN, 96–97
IPCS drive, 429
ipconfig command, 354–355, 354–355
IPS (in-plane switching) displays, 16
IR (infra-red) connectors, 35
IRPs (incident response plans), 610
rpi1_not_less_or_equal message, 264
ISDN (Integrated Services Digital Network), 100
ISP email configuration, 42–47
ITX (Information Technology eXtended) motherboards, 161, 161
iwconfig command, 457

K
Kensington locks, 25, 25
key fobs, 474
keyboard, video, and mouse (KVM) devices, 188
keyboards
backlight, 21
description, 185
replacing, 9
sticking keys, 280
keychain drives, 152–153, 152
keychain password system, 451–452
keyloggers, 490
kill command, 459
killing tasks, 552
Kindle devices, 30
knowledge base/articles, 583
KVM (keyboard, video, and mouse) devices, 188

L
land grid array (LGA) sockets, 177
language
communication techniques, 613–614
settings, 349
LANs (local area network), 101
laptop hardware and components
digitizers, 18, 19
displays, 15–17
hardware/device replacement, 8–9
batteries, 13
CPUs, 15
DC jacks, 13
hard drives, 9, 10
keyboards, 9
memory, 10–11
mini-PcIe cards, 12
optical drives, 11
plastics, 14
screen, 12–13
smart card readers, 11
speakers, 14
system boards, 14
touchpads, 13
video cards, 12
wireless cards, 11–12
inverters, 18
microphones, 18
webcams, 18
WiFi antenna connectors, 17–18
laptops
cloud computing, 241, 241
components, 201–202
docking stations, 24–25
dual displays, 20
physical locks, 25
rotating and removable screens, 26
special function keys, 19–23, 22–24
laser printers, 210
components, 210–213, 211–213
imaging process, 214–217, 214–217
maintenance, 218–220
printing steps summary, 217–218, 218
Launch Folder Windows In A Separate Process option – MMC

Launch Folder Windows In A Separate Process option, 411
LDAP displays, 16
LDAP (Lightweight Directory Access Protocol), 65
leaked personal data, 573
least privilege concept, 485
LED backlighting, 16–17
LED displays, 17
legacy systems, 90
LGA (land grid array) sockets, 177
licensing, 610–611
lifting safety procedures, 601–602
light switches, IoT-enabled, 75
Lightning connectors, 139
characteristics, 127, 128
description, 33–34, 33
limitations, 34
Lightweight Directory Access Protocol (LDAP), 65
limited connectivity, troubleshooting, 547
line-of-sight wireless, 101
line printers, 209
lines in laser printing, 219
link local addresses
overview, 93
troubleshooting, 299–300
Linux operating systems
best practices, 441–445
commands, 454–459
description, 322–323
features, 450–454
overview, 440–441
tools, 445, 450, 446, 448, 450
liquid-based cooling cases, 178–179
List Folder Contents permission, 509
listening, active, 614
local area network (LANs), 101
local installations for applications, 425
local resources for networks, 298
Local Security Policy tool, 373
local shares, 511
local user permissions, 425
Local Users And Groups tool, 373
location data, synchronizing, 52
location tracking
settings, 23, 23
unauthorized, 573
locator applications, 522
lockout
failed password attempts, 516, 517
system, 570
locks
biometric, 472, 473
cable, 473
door, 472
IoT-enabled, 76
laptops, 25
network, 477
screen, 517, 521–522
server, 473
USB, 473
lockups
malware, 559
system, 259
logical partitions, 346
logical unit numbers (LUNs) in SCSI, 134
login attempts restrictions, 523
login scripts for Active Directory, 475
logon time, restricting, 516
logs
boot, 547–548
Event Viewer, 375–377, 376–377
failed jobs in, 277
malware clues in, 561
mobile devices, 570
problem solving, 256
system and application, 561
troubleshooting, 268
LoJack product, 169
Long-Term Evolution (LTE) technologies, 40, 85–86
loopback addresses, 94
loopback plugs, 104
loops in scripts, 621
loud noises
hard drives, 269
troubleshooting, 262
low-level drive format, 529
low memory errors in printing, 294
Low process priority, 385
low RF signals, 301, 302
ls command, 454
LTE (Long-Term Evolution) technologies, 40, 85–86
lumens for projectors, 187
LUNs (logical unit numbers) in SCSI, 134
lviscreate command, 446–447

M

M2 drives, 149
MAC address filters
overview, 477
SOHO networks, 79
MacOS operating systems
best practices, 441–445
description, 322
features, 450–454
overview, 440–441
tools, 445–450, 446, 448, 450
macro viruses, 493
magnetic hard drives
overview, 149–151, 150
vs. SSD, 10
magnetic readers, 188
mail servers, 88
maintenance
drives, 442, 447
printers, 209, 210
impact, 225–226
inkjet, 222–223
laser, 218–220
thermal printers, 224
maintenance kits for laser printers, 220
malware
keyloggers, 490
lockups, 559
log disclosure of, 561
mobile devices, 523
preventing, 496–499
ransomware, 489–490
removal best practices, 562–564
rootkits, 490
slow performance, 559
Trojan horses, 490
unauthorized actions, 573
viruses, 490–495, 492, 495
man-in-the-middle (MITM) attacks, 503
managed switches, 66–67
MANs (metropolitan area networks), 102
mantraps, 470–471, 471
Manually Connect To A Wireless Network option, 431
mapping
drives, 369, 370, 429
ports, 78, 534
printers, 429–430, 430
masks
filter, 603
subnet, 91–92, 95–96, 298, 438
master boot record (MBR), 346
master computers in operating system images, 434
Master setting in IDE drives, 155, 156
material safety data sheets (MSDSs), 604
mATX (mini-ATX) motherboards, 161
MBR (master boot record), 346
MDM (Mobile Device Management) policies, 476
measured services in cloud computing, 239
Media Center, 327
media options, 21, 22
media streaming with NAS devices, 199
media testers, 104
memory, See RAM
metered services in cloud computing, 240
meters, 103, 600, 600
Metro interface, 329–330, 329
metropolitan area networks (MANs), 102
mice, 185
Micro-SD cards, 153
Micro-SD slots, 39
Micro-USB
connectors, 139
ports, 32, 32
microphones
description, 187
laptops, 18
unauthorized activation, 573
Microsoft Management Console (MMC), 373–375, 398
Microsoft Windows, See Windows operating systems
MIMO (Multiple In/Multiple Out) feature, 83
mini-ATX (mATX) motherboards, 161
Mini HDMI ports, 125
mini-ITX motherboards, 161–162
mini-PCIe cards, 12
Mini-SD cards, 154, 154
Mini-USB
connectors, 139
ports, 32, 32
miniPCI cards, 163, 164
mirroring, disk, 157, 157
Mission Control, 450–451
MITM (man-in-the-middle) attacks, 503
MMC (Microsoft Management Console), 373–375, 398
Mobile Device Management (MDM) policies, 476
mobile devices, 36–39, 37 38
characteristics, 26–31, 28–30
components, 201–202
configuring, 39
Bluetooth, 40 42
e-mail, 42–47
PRI, 47–48
radio frequency, 48–49
VPN, 49
wireless/cellular data network, 39–40
collections, 31–35, 32–33
disassembling, 288
displays, 15–19
laptop features, 19–26, 22–25
laptop hardware and components, 8–15
mutual authentication, 53
review questions, 54 56
security, 520–521
antivirus software, 523
authentication, 524
authenticator applications, 524
biometric authentication, 524
encryption, 524
failed login attempts restrictions, 523
firewalls, 525–526
locator applications, 522
policies and procedures, 526
remote backup applications, 522 523
remote wipes, 522
screen locks, 521
troubleshooting, 571–573
trusted and untrusted sources, 524–525, 525
updates, 523
synchronizing, 50 53
Troubleshooting overview, 278–289, 281, 283
security, 571–573
software, 564 570
models in inventory management, 587
modems, 68–69, 76 77
Modify permission, 308–309
Molex connectors examples, 140, 141
power connectors, 192
monitors. See also displays; screen connecting, 184
mobile devices, 282, 566
workstations, 196
motherboards
connectors types, 162 167, 162 166
form factors, 160–162, 160–161
power supply adapters, 190, 190
mounting drives, 392
moving folders and files, 508
MSConfig tool
Boot tab, 379, 379
description, 398
disabling application startup, 555, 555
General tab, 378, 378
Services tab, 379, 380
Startup tab, 380, 381
Tools tab, 382
MSDSs (material safety data sheets), 604
MSINFO32 utility, 399
MSTSC utility, 399
multiboot OS installations, 342
multicore processors
gaming PCs, 196
overview, 172
workstations, 195
multifactor authentication
description, 482
security, 486
multimeters, 103
multimonitor taskbar, 330, 331
multipartite viruses, 493, 493
multiple-barrier systems, 472
multiple desktops in MacOS and Linux, 450–451
Multiple In/Multiple Out (MIMO) feature, 83
multiplexers for CPU speed, 173
multipurpose cables, 127 130, 128 130
multitouch, troubleshooting, 283 284, 283
music, synchronizing, 51–52
mutation, virus, 494
mutual authentication in mobile devices, 53
mv command, 456

N
nano-ITX motherboards, 161
NAT (network address translation)
IP addressing, 97–98
SOHO networks, 79
navigation tools, 352–353
near field communications (NFC) description, 188
overview, 34
wireless protocols, 84
net use command, 369 370, 369 370
net user command, 370
NetBIOS/NetBT, 64
NetBoot method, 340
netsetup.log file, 547
netstat command, 358–359, 358
Network Access Control, 90
Network address translation (NAT)
IP addressing, 97 98
SOHO networks, 79
Network and Sharing Center, 421, 422
network-attached storage devices, 199
network-based IDS (NIDS), 89
network-based installations for applications, 425
Network File System (NFS), 347
network installations for operating systems, 342 343
network interface cards (NICs)
configuring, 73–74, 73–74
description, 67
indicator lights, 263
NAS devices, 199
overview, 181
power settings, 281, 281
properties, 439 440, 439
proxy firewalls, 480
troubleshooting, 300–301
virtual, 241–242
network time protocol (NTP) servers, 88
network topology diagrams, 582–583,
583–584
networking, 62
cables, 120–124, 122–123
hardware devices, 65–71, 68–71
host services, 86–90
Internet connections, 99–101
IP addressing, 90–98
ports and protocols, 62–65
review questions, 106–109
settings updating, 552
SOHO. See small office and home office (SOHO) networks
thin clients, 199
tools, 102–105, 103
troubleshooting, 297 304, 302 304
types, 101–102
virtual machine requirements, 244
wireless protocols, 82 86
networking configuration, 426–427
alternative IP addresses, 437–438,
439
connections, 431 432
domain setup, 427 428, 428
firewalls, 436–437
HomeGroup vs. workgroups, 427
network type, 435 436, 436
NIC properties, 439 440, 439
printers, 429–430, 430
proxy settings, 432, 432
Remote Assistance, 434 435, 435
Remote Desktop, 433–434, 434–434
shares, 429
Networking tab in Task Manager, 388, 388
New Technology File System (NTFS) description, 347
security settings, 506 509
Next Generation Form Factor (NGFF), 149
NFC (near field communications) description, 188
overview, 34
wireless protocols, 84
NFS (Network File System), 347
NGFF (Next Generation Form Factor), 149
NICs. See network interface cards (NICs)
NIDS (network-based IDS), 89
no image on screen, troubleshooting,
273–274
no operating system found message, 548
noise
hard drives, 269
troubleshooting, 262
non-compliant systems, 504
Non-Volatile Memory Host Controller Interface Specification (NVMHCIIS), 149
nonimpact printers, 209
nonparity RAM, 145
nonvolatile random-access memory (NVRAM), 169, 170
Nook devices, 30
Normal process priority, 385
NOTEPAD utility, 399
octets in IP addressing, 91
off-site email applications, 240
off-site storage, 498, 591 592
OLED (organic light-emitting diode) displays, 17
on-demand resource utilization in cloud computing, 239
on-site storage, 498, 591
onboard video cards, 179
1.8 inch hard drives, 10
open ports, 67
open source software, 611
operating system not found message, 270
operating systems, 321
32-bit vs. 64-bit, 321–322
boot methods, 339–340
cell phones and tablets, 323
compatibility, 324, 350
driver installation, 349–350
file systems, 346 348
formatting, 348
installation types, 340–344
Linix, See Linux operating systems
Mac, See MacOS operating systems
partitioning, 344–346
reloading, 552
repairing, 553
review questions, 460–462
shared device settings, 206
third-party drivers, 348 349
time, date, region and language settings, 349
updates, 560
upgrade paths, 332–338
vendor-specific limitations, 323–324
virtualization workstations, 196
Windows. See Windows operating systems
workgroup vs. domain setup, 349
workstations, 322 323
operational procedures, 582
change management, 587–590
communication techniques and professionalism, 613–619
disaster prevention and recovery methods, 590 596, 594 595
documentation, 582 587, 583 584
environmental impacts, 603–608, 606–607
prohibited activities, 608 612
remote access technologies, 622–626, 622–625
review questions, 627–630
safety, 596–603, 598–600
scripts, 619–621
optical drives
replacing, 11
types, 147–149
organic light-emitting diode (OLED) displays, 17
organizational units (OUs), 476
orientation
printers, 203
screen, 21, 22
OS X operating systems, 322
OUs (organizational units), 476
out-of-memory errors in laser printers, 219
output voltages in power supplies, 190
overclocking CPUs, 174
overheating
mobile devices, 286, 568
troubleshooting, 262
video cards, 274
oversized images and icons, 277, 277
overwriting drives, 208, 529

P

Paas (platform as a service), 238
packet-filter firewalls, 480
page description language (PDL), 293
Page_Fault_in_nonpaged_area message, 264
page printers, 209–210
pairing, Bluetooth, 41, 572
PANs (personal area networks), 102
paper
feeding issues, 291–292
impact printers, 225, 226
thermal printers, 224
paper jams
inkjet printers, 223
laser printers, 218 219
troubleshooting, 292
paper transport assembly in laser printers, 212, 212
parental controls, 534
parity RAM, 145
partitions, hard drives
extending, 394
overview, 344–346
shrinking, 394–395, 394–193
splitting, 394
passcode locks, 522
passive heat sinks, 178
passive hubs, 68
password command, 455–456
passwords
admin, 517
BIOS, 168
BIOS/UEFI, 515
changing, 586
expiration, 515, 586
policies, 585–586
rainbow tables, 504
requiring, 516, 586
resetting and unlocking, 518–519
screensavers, 515
SOHO networks, 532–533
strong, 481–482, 514–515, 585–586
synchronizing, 53
PAT (port address translation), 98
patch panels, 69, 69
patches
MacOS and Linux, 443
mobile devices, 523
workstations, 520
PCI-DSS standard, 611
PCI Express (PCIe)
overview, 163, 165
power supply connectors, 192–193, 195
video cards, 180, 180
PCI (Peripheral Component Interconnect)
bus, 162–163, 162
PCL (Printer Control Language), 293
PDF, printing to, 226
PDL (page description language), 293
performance
hard drives, 269
malware issues, 559
mobile devices, 284 285, 567
slow transfer speeds, 301
System utility, 412–413, 412
troubleshooting, 546
Performance Monitor tool, 373
Performance tab in Task Manager, 387, 387
perimeter barriers, 472
Peripheral Component Interconnect (PCI)
bus, 162 163, 162
peripherals
cables for, 130–136, 131 132, 134 136
purposes and uses, 183–189, 185–186, 189
permissions
applications, 425
changed, 561
directory, 482 483
inheriting, 512
printers, 293
propagation, 511
restricting, 516
security settings, 506–509
personal area networks (PANs), 102
personal calls, 615
personal data, leaked, 573
personal interruptions, 616
personal licenses, 611
personal package archives (PPAs), 443, 444
personal safety, 601–603
personally identifiable information (PII), 611
PGA (pin grid array) sockets, 177, 177–178
phage viruses, 494
PHI (protected health information), 612
phishing, 501
phones
applications, 240
disposal, 601
operating systems, 323
smartphones, 27
physical barriers, 472
physical data destruction, 527–529
physical locks for laptops, 23
physical security in SOHO networks, 535, 135
physical tokens, 473
pickup rollers in laser printers, 212
pico-ITX motherboards, 161
pictures, synchronizing, 51
PII (personally identifiable information), 611
pin codes for Bluetooth, 42
pin grid array (PGA) sockets, 177, 177–178
ping command, 355–356, 356
pinning to taskbar, 330
Pinwheel of Death (PWOD), 264–267, 265–266, 271, 549
PIO (Programmed Input/Output) setting, 156
pixels, troubleshooting, 274
Plain Old Telephone System (POTS), 99
plans
change management, 589
problem solving, 257
plastic filaments in 3D printers, 227, 227
plastics, replacing, 14
platform as a service (PaaS), 238
plenum cable, 121
PoE (Power over Ethernet), 70, 70
point-to-multipoint technology, 100
pointer drift, 280
policies and procedures for mobile devices, 426
polymorphic viruses, 494, 494
pools in cloud computing, 239
POP (Post Office Protocol), 63
Pop-Up Blocker Settings dialog box, 558, 558
pop-ups, 558, 558
port address translation (PAT), 98
port replicators, 24–25
ports
disabling, 534
e-mail, 44
forwarding, 78, 79, 534
mobile devices, 32, 34, 32 33
networking, 62–65
open and closed, 67
printer, 204, 206
security, 476–477
positive attitudes, 614
Post Office Protocol (POP), 63
POST (power-on self-test), 259–260
POTS (Plain Old Telephone System), 99
power
malware drains on, 571
mobile devices, 281, 571
options, 415–416
power-related threats, 605
safety procedures, 601
troubleshooting, 263
UPs, 593–594
power button, 166
power-level controls in SOHO networks, 532
power light, 166
power line Ethernet bridges, 70, 71
power-on self-test (POST), 259–260
Power over Ethernet (PoE), 70, 70
power supplies, 189
connectors, 191–194, 191–193
input voltages, 189–190
laser printers, 213
motherboard adapters, 190, 190
output voltages, 190
wattage ratings, 191, 191
Power Users group, 506
PPAs (personal package archives), 443, 444
Preboot Execution Environment (PXE), booting from, 339
preferred roaming list (PRL), 47–48
PRI (product release information), 47–48
primary corona in laser printers, 211, 214
primary partitions, 345
principle of least privilege, 485
print heads
impact printers, 225–226
inkjet printers, 221
Print Management tool, 374
print servers, 87
printS drive, 429
Printer Control Language (PCL), 293
printers
3D, 227, 227
configuring, 203
impact, 224–226
inkjet, 220–223, 220
integrated print servers, 204–205
laser. See laser printers
overview, 208–210
sharing, 203–208, 205–206
sharing vs. mapping, 429–430, 430
thermal, 223, 224
troubleshooting, 289–296
virtual, 226
priorities
print, 295
processes, 385–386
privacy
customer materials, 618–619
shared devices, 207–208
privacy screens, 474
Privacy tab in Internet Options applet,
403–404, 404
private clouds, 238
private IP addresses, 92, 94
PRL (preferred roaming list), 47–48
Processes tab in Task Manager, 384–386, 385
product release information (PRI), 47–48
professional titles, 614–615
profiles
building, 556
security requirements, 526
slow loads, 551
Programmed Input/Output (PIO) setting, 156
Programs and Features, 416, 417
Programs tab in Internet Options applet, 404–405, 405
prohibited activities
incident response, 608–610
licensing violations, 610–611
overview, 608
policies and best practices, 612
regulated data, 611–612
Q
q command, 458
QR scanners, 184
Quality of Service (QoS), 440
SOHO networks, 79–81
NICs, 440
quality settings for printers, 203, 219
queries in DNS servers, 87
question mark (?) command, 371
questions in problem solving, 255
quick formatting drives, 348
R
radio firmware, configuring, 48–49
radio frequency identification (RFID), 471
badge readers, 471
RF, 34
wireless protocols, 84–85
radio power levels in SOHO networks, 532
RADIUS (Remote Authentication Dial-In User Service), 488–489
RADS (rate-adaptive DSL), 76
RAID disks
NAS devices, 199
overview, 156–158, 157, 158
troubleshooting, 270–271
rainbow tables, 504
RAM
application requirements, 425
correcting, 145
operating systems, 322
overview, 141–142, 141, 142
printers, 294
replacing, 10–11
slots, 145–147, 146
system lockups, 259
types, 142–145, 144
workstations, 195–196
Rambus dynamic RAM (RDRAM), 142, 145
Rambus inline memory modules (RIMMs), 142, 145
ransomware, 489–490
rapid elasticity in cloud computing, 239
rate-adaptive DSL (RADSL), 76
RDP (Remote Desktop Protocol)
connections, 433–434, 433–434
description, 64
settings, 622–623, 623–624
Remote Disk icon, 453
remote installations of operating systems, 342–343
remote printing, 205
remote problems
limited connectivity, 547
networks, 298
Remote tab in System utility, 413, 413
remote virtual desktops, 241
remote wipes, 522
removable laptop screens, 26
renamed system files, 560
repair OS installations, 342
repairing operating systems, 553
repeaters, 68, 68
reporting incidents, 608
reservations in DHCP, 94
reset button, 167
resetting operating systems, 344, 553
Resilient File System (ReFS), 348
Resolution Enhancement Technology (RET), 219
resolution settings, display, 406
resources
cloud computing, 239
malware utilization of, 573
networks, 298–299
virtual machine requirements, 243
restarting services failures, 552
restore option for operating systems, 344
Restore Previous Folder Windows At Logon option, 411
restores
disaster recovery, 497–499
MacOS and Linux, 446
operating systems, 553
RET (Resolution Enhancement Technology), 219
retroviruses, 494
RF signals, troubleshooting, 301–302
RFID (radio frequency identification)
badge readers, 471
NFC, 34
wireless protocols, 84–85
RG-6 connectors, 139
RG-59 connectors, 139
RGB LEDs, 17
ribbons for impact printers, 225
RIMMs (Rambus inline memory modules), 142, 145
riser cards, 164, 165
risk analysis in change management, 589
RJ-11 connectors, 137, 137
RJ-45 connectors, 137, 137
rm command, 456
robocopy command, 368–369
rogue antiviruses, 560
rollers
inkjet printers, 221
laser printers, 212, 212, 215
troubleshooting, 292
rolling back
drivers, 552
updates, 552
rootkits, 490
rotating screens in laptops, 26
routers
description, 66
SOHO networks, 72
troubleshooting, 298, 301
RS-232 connectors, 138, 138
rsync tool, 447
rules
firewalls, 436
port forwarding, 78
Run as Administrator, 512–513
runas command, 371–372

S
S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) errors, 271, 272
SMIME configuration, 44, 45
SaaS (software as a service), 238
safe boots, 555–556
safety goggles, 602
safety procedures, 596
component handling and storage, 597, 599, 599
equipment grounding, 596, 597
government regulations, 603
personal, 601, 603
toxic waste handling, 599, 601, 600
sags, 593
salting passwords, 504
SATA (Serial AT Attachment) drives
overview, 131–133, 131–132
power connectors, 191, 191
satellite connections, 100
scanners, 184
scanning assembly in laser printers, 211, 212
scans, malware, 563
scheduled backups, 590, 593
scheduling malware scans, 563
scope
change management, 588
IP addressing, 93
screen. See also displays
brightness, 20–21
locking, 517, 521, 522
orientation, 21, 22
privacy, 474
replacing, 12, 13
rotating and removable, 26
sharing, 448–449, 625
screensavers, 515, 556
scripts
Active Directory, 475
basics, 619, 621
SCSI (Small Computer System Interface) connectors, 140
overview, 134, 134
SD (Secure Digital) cards, 153, 153
SDSL (symmetric DSL), 76
SECC (single-edge contact cartridge) sockets, 177–178, 177
secondary caches – small office and home office (SOHO) networks

security guards, 472
Security log in Event Viewer, 375
Security tab in Internet Options applet, 401–402, 402
Select The Type Item In The View option, 411
self-grounding, 599
separate pads in laser printers, 212
Serial AT Attachment (SATA) drives overview, 131–133, 131–132
power connectors, 191, 191
serial cables, 130, 131
serial numbers in inventory management, 587
serial ports, 204
Server Message Block (SMB), 64
servers
description, 101
DHCP, 87, 299–300
derpoint management, 90
integrated print, 204 205
locks, 473
RADIUS, 489
roles, 86 88
Service Location Protocol (SLP), 64
service set identifiers (SSIDs)
changing, 531
disabling broadcasts of, 81, 531
not found, 302–304, 302–304
SOHO networks, 72
services
disabling, 555
failures to start, 549–550, 550
restarting, 552
SERVICES.MSC utility, 398
Services tab
MSCfg tool, 379, 380
Task Manager, 386, 386
Set Up A Dial-Up Connection option, 412
Set Up A Wireless Ad Hoc (Computer-To-
Computer) Network option, 431
Set Up A Wireless Router Or Access Point
option, 431
Setup log in Event Viewer, 375
setapact.log file, 547
setaperr.log file, 547
sfc command, 361–362
.sh files, 620
shared devices, 205–208, 205–206
shared files and folders, 510–512, 510–511
shared resources in cloud computing, 238–239
shares
administrative, 511
networking configuration, 429
permissions, 506–509
troubleshooting, 298
sharing
files, 199, 626
printers, 202–208, 205–206, 429–430, 430
screen, 448 449, 625
sheet fed printers, 209
shell in Linux, 448
shielded twisted pair (STP) cable, 121
shims, 338
short battery life, 286
shoulder surfing, 502
Show Drive Letters option, 411
Show Encrypted Or Compressed NTFS
Files In Color option, 411
Show Hidden Files, Folders, And Drives
option, 409
Show Pop-Up Description For Folder And
Desktop Items option, 411
Show Preview Handlers In Preview Pane
option, 411
shredders, 527
shrinking partitions, 394–395, 394–395
shutdown command
Linux, 455
Windows, 361
shutdowns, unexpected, 259
side-by-side apps in Windows, 329
signature pads, 186
signatures, virus, 494
SIMMs (single inline memory modules)
circuit boards, 145
description, 141–142, 142
Simple Mail Transfer Protocol (SMTP), 63
Simple Network Management Protocol
(SNMP), 65
simulated battery pulls, 284
single channel RAM, 144
single-core CPUs, 172
dingle-edge contact cartridge (SECC)
sockets, 177–178, 177
single-factor authentication, 488
single inline memory modules (SIMMs)
circuit boards, 145
description, 141–142, 142
single sign-on (SSO), 53, 512
six-pin power-supply connectors, 192
64-bit operating systems, 321 322
slang, 613–614
slave setting in IDE drives, 155, 156
Sleep power option, 415
slots for RAM, 145 147, 146
slow bootup, 550
slow performance
hard drives, 269
malware issues, 559
mobile devices, 284–285, 285, 567, 572
transfer speeds, 301
troubleshooting, 546
slow profile loads, 551
SLP (Service Location Protocol), 64
Small Computer System Interface (SCSI)
connectors, 140
overview, 134, 134
small office and home office (SOHO)
networks
access points, 72
device sharing, 203–205
drivers, 202–203
currently enabled configuration, 74–75
firewall settings, 77–80
Internet of Things devices, 75 76
IP addressing, 73
software
antivirus. See antivirus software application requirements, 53
compatibility, 322
installing, 349–350
licensing, 610 611
troubleshooting
malware removal, 562–564
mobile devices, 564–570
review questions, 574 575
Windows. See Windows operating systems
trusted and untrusted sources, 485
software as a service (SaaS), 238
software firewalls, 499
software tokens, 476
SOHO. See small office and home office (SOHO) networks
solid-state drives (SSDs)
booting from, 339
description, 149
vs. other drive types, 10
sound. See audio
Sound aplle, 419, 420
sound cards
description, 180, 181
gaming PCs, 197
spnam, 560
spanned partitions, 345
speakers
description, 187
mobile devices, 36, 287
replacing, 14
troubleshooting, 569
spear phishing, 501
special function keys, 19–23, 22–24
speed
ATA standards, 133
Bluetooy, 35
bus, 171
CPUs, 173–174
dsl, 77
eSATA, 140
fiber-optic cabling, 124
magnetic hard drives, 151
mobile devices, 572
NICs, 181, 440
PCI cards, 164
RAM, 144
transfer, 301
USB cables, 130
wireless protocols, 84
spikes, 593
splitting partitions, 394
spoofing, 504
Spot Light tool, 452
spyware, 496
SSDs (solid-state drives)
booting from, 339
description, 149
vs. other drive types, 10
SSH (Secure Shell)
description, 65
overview, 625
SSID, See service set identifiers (SSIDs)
SSL (Secure Sockets Layer) email settings, 44
SSO (single sign-on), 53, 512
Standby power option, 415
Start screen, 332
StartUp Repair option, 497
Startup tab in MSConfig tool, 380, 381
stateful inspection firewalls, 481
static eliminator strips in printing, 291–292
static IP addresses, 92, 533
status lights, 263
stealth viruses, 494–495
sticking keys, 280
storage devices, 147
cloud, 595
configuring, 155–159
flash drives, 152
hybrid drives, 151, 152
magnetic hard drives, 149–151
network-attached, 199
optical drives, 147
storage spaces, 396–398, 396–397
STP (shielded twisted pair) cable, 121
strains in printing, 290–291
strings in scripts, 621
striped partitions, 345
striping with parity, 157–158, 158
strong passwords
guidelines, 481–482
overview, 514–515, 585–586
stub pixels, 274
su command, 458
subnet masks
alternative IP addresses, 438
default, 91–92, 95
IP addressing, 95–96
troubleshooting, 298
sudo command, 458
suppliacs in RADIUS, 489
surge protectors, 594–595, 594–595
surges, 593
suspend power option, 415
swipe locks, 521
switches
description, 66–67
light, 75
PoE, 70
SOHO networks, 72
troubleshooting, 301
symmetric DLS (SDSL), 76
symptoms
troubleshooting, 258–268, 265–267
video issues, 272–278, 276–277
viruses, 491
Sync Center Control, 424, 424
synchronizing
cloud computing apps, 240
laptops, 201
mobile devices, 50, 50
syslog servers, 88
Sysprep utility, 343–344
system boards
form factors, 160–162
overview, 625
replacing, 14
System Configuration tool, 374
System File Checker (SFC), 361–362
system files and folders
overview, 512
renamed, 560
System Image Recovery option, 497
system lookouts in mobile devices, 570
system logs
Event Viewer, 375
malware clues in, 561
problem solving, 256
System Properties dialog box in Remote Desktop, 433–434
System Protection tab in System utility,
413, 413
system requirements for applications, 425
System Restore option, 497
System restore tool, 399
system utilities, 398–400
System utility, 411–412
performance, 412–413, 412
Remote tab, 413
System Protection tab, 413, 414
T

T-8 Torx screwdrivers, 8
T568A and T568B cable, 122, 122
tables
- applications, 240
disposal, 601
- features, 27
- operating systems, 323
TACACs+ (Terminal Access Controller
Access-Control System Plus),
488–489
tailgating, 502
tap pay devices, 188
tar utility, 445, 447
targets in SSCI, 134
Task Manager, 382–383
- App History tab, 384, 384
- Applications tab, 383, 383
- Details tab, 389, 390
- Networking tab, 388, 388
- Performance tab, 387, 387
- Processes tab, 384, 386, 385
- Services tab, 386, 386
- Users tab, 388, 389
Task Scheduler tool, 374
- taskbar, 330, 333
- taskkill command, 363–364
- tasks, killing, 552
TCP (Transport Control Protocol)
- ports, 62–65
- printers, 206
- vs. UDP, 65
Telnet protocol, 63, 623–624, 624–625
temperature control, 604
Temporal Key Integrity Protocol (TKIP)
description, 487
SOHO networks, 81
Terminal Access Controller Access-Control
System Plus (TACACs+), 488–489
Terminal in Linux, 448, 448
test pages, printing, 295
testing
- backups, 593
- problem solving theories, 256–257
thermehing
- configuring, 40
- connections, 100
- mobile devices, 33
- testing, 615–616
TFTs (thin-film transistors), 16
- theories in troubleshooting, 256
thermal paste, 179
thermal printers, 223–224
thermostats, IoT-enabled, 75
thick clients
- description, 198
desktop, 200
thin clients
- description, 198
- 199
desktop, 200
thin-film transistors (TFTs), 16
- third generation (3G) cellular technology,
unmanaged switches, 67
unshielded twisted pair (UTP), 122
untrusted sources
mobile devices, 524–525, 525
software, 485
updates
anti-virus/anti-malware, 445
applying, 553
boot order, 554
drivers, 443–444
failures, 560
firmware, 167, 443–444, 534
installing, 349–350
limitations, 324
Linux, 442–443, 442
MacOS, 443, 443
mobile devices, 47–48, 523
network settings, 552
rolling back, 552
workstations, 520
Upgrade Advisor, 336, 338
upgrade paths for operating systems
compatibility tools, 338
overview, 332
Upgrade Advisor, 338
Windows 7, 335–337
Windows 8, 337
Windows 8.1, 337
Windows 10, 338
UPnP (Universal Plug and Play), 79
UPSs (uninterruptible power supplies), 593–594
USB. See Universal Serial Bus (USB)
USB 2.0/3.0, 130
USB-C
connectors, 129, 130, 139
ports, 32, 12
USB to Ethernet adapters, 135, 135
Use Check Boxes To Select items option, 411
User Account Control (UAC), 382
User Account Management tool, 375
User Accounts dialog box, 408
user and group security settings, 505
User Datagram Protocol (UDP)
ports, 62
stateful inspection firewalls, 481
vs. TCP, 65
user permissions for applications, 425
usernames
changing, 586
SOHO networks, 532–533
Users tab in Task Manager, 388, 389
UTM (unified threat management), 89
UTP (unshielded twisted pair), 122
vendor-specific limitations for operating systems, 323–324
ventilation control, 605
verification in problem solving, 257
vertical lines on printed page, 293–294
very high bit-rate DSL (VHDSL), 76
VGA cables, 124, 124
VGA mode, troubleshooting, 273
VHDSL (very high bit-rate DSL), 76
vi command, 459
video. See also displays
screen cables, 124–127, 124–126
troubleshooting, 272–278, 276–277
workstations, 195
video cards, replacing, 12
video drivers, system lockups for, 259
video editing workstations, 195–196
videos, synchronizing, 52
View tab
Folder Options dialog box, 410–411
folder settings, 409–411, 409
virtual application streaming in cloud computing, 240
virtual desktop infrastructures (VDIs), 241–242
virtual local area networks (VLANs), 97
virtual machines
emulator requirements, 243
hypervisors, 244–245, 244–245
network requirements, 244
purpose, 242–243
resource requirements, 243
security requirements, 243
virtual memory performance, 412
virtual network interface cards (VDIs), 241
virtual printers, 226
virtual private networks (VPNs)
configuring, 49
connections, 431
IP addressing, 96–97
security, 484
virtual reality (VR) headsets, 29, 30, 29–30
virtual technology, 173
virtualization
application streaming, 240
client-side, 242–245
desktop, 241–242
review questions, 246
workstations, 196
viruses
anti-virus software. See anti-virus software
infections, 491–492, 492
overview, 490
symptoms, 491
system lockups, 259
types, 492–495, 493–495
vishing, 501
VLANs (virtual local area networks), 97
VNIs (virtual network interface cards), 241–242
voltages
power supplies, 189–190
settings, 170, 170
voltmeters, 600, 609
volume settings, 20
VPNs. See virtual private networks (VPNs)
VR (virtual reality) headsets, 29–30,
29–30, 184, 185
W
Wake-on-LAN (WoL) feature, 440
WANs (wide area networks), 101
warm docking level, 24
watches, 28
water-cooling for gaming PCs, 197
waterproofing mobile devices, 38
wattage ratings for power supplies, 191, 191
wax transfer in thermal printers, 223
weak signals, 571
wearable technology devices, 27
web servers, 87
webcams
description, 187
laptops, 18
weight limitations, 602
WEP (Wired Equivalent Privacy) description, 486
SOHO networks, 80
whaling, 501
white LEDs (WLEDs), 17
white lines on printed page, 294
whitelisting, 79
Wi-Fi Protected Access 2 (WPA2) description, 486
SOHO networks, 80
Wi-Fi Protected Access (WPA) description, 486
SOHO networks, 80
variants, 487
Wi-Fi protected setup (WPS), 532
wide area networks (WANs), 101
WiFi
antenna connectors, 17
unintended connections, 572
WiFi analyzers, 104–105
Windows Compatibility Center, 338
Windows Firewall configuring, 437
description, 375
enabling and disabling, 437
exceptions, 436
managing, 414
SOHO networks, 75
Windows Memory Diagnostic tool, 374,
497
Windows operating systems
application installation, 424–426
command line tools. See command line tools
Control Panel. See Control Panel utilities
corporate vs. personal needs, 327–328, 328
desktop styles and interfaces, 328–332, 329, 331
networking configuration. See networking configuration overview, 322–325
security settings
authentication, 512
BitLocker, 513
EFS, 513, 513
NTFS vs. share permissions, 506–509
Run as Administrator, 512–513
shared files and folders, 510–512, 510–511
system files and folders, 512
user and groups, 505–506
tools, 372
administrative, 373–378, 376–377
Disk Management, 390–398, 391, 393–397
MSConfig, 378–382, 378–382
system utilities, 398–400
Task Manager, 382–389, 383–390
troubleshooting, 545–546
application crashes, 549
black screens, 549
blue screens, 549
booting, 547 548
connectivity, 547
fragmented drives, 551
missing OS, 548
performance, 546
service failures, 549–550, 550
slow bootup, 550
solutions, 551 557, 551, 554–555
upgrade paths, 332–338
Windows 7, 325
Windows 8, 325–326
Windows 8.1, 326
Windows 10, 326
Windows Server Update Services (WSUS), 520
Windows Setup program, 156
Windows Update tool, 399
wipes
drives, 528, 530
mobile devices, 522
wired connections, 431
Wired Equivalent Privacy (WEP) description, 486
SOHO networks, 80
wired options for mobile devices, 32–34, 32–33
wired printers, 203
wireless
connections, 431
connectivity issues, 282
data network configuration, 39–40
function keys, 20
intermittent, 280, 565
mobile device options, 34–35
printers, 204
protocols, 82 86, 486 487
security, 486–489
settings, 201–202
SOHO network security, 531 532
SOHO network settings, 80 81
wireless cards
NICs, 181
replacing, 11 12
wireless mesh networks (WMNs), 102
wireless personal area networks (WPANs), 102
wireless wide area networks (WWANs), 431
WLEDs (white LEDs), 17
WMNs (wireless mesh networks), 102
WoL (Wake-on-LAN) feature, 440
work network settings, 435
workgroups
vs. HomeGroup, 427
setup, 349
working copy backups, 497–498, 591
workspace switchers, 451, 457
workstations
audio/video editing, 195–196
description, 101
graphic, 194 195
operating systems, 322–323
security, 514
account management, 516–519, 518
AutoRun function, 519
cryptography, 519
passwords, 514–516
updates, 520
virtualization, 196
worms, 495–496
WPA (Wi-Fi Protected Access) description, 486
SOHO networks, 80
variants, 487
WPA2 (Wi-Fi Protected Access 2) description, 486
SOHO networks, 80
WPANs (wireless personal area networks), 102
WPS (Wi-Fi protected setup), 532
wrap plugs, 104
wrist straps, 597–598, 598
Write permission, 509
writing step in laser printers, 214, 214
WSUS (Windows Server Update Services), 520
WWANs (wireless wide area networks), 431

X
xcopy command, 367–368
xD-Picture cards, 154, 154
XP Mode in virtual machines, 243
XPS, printing to, 226

Y
Yahoo email, 47

Z
Z-Wave protocol, 85
zero-day vulnerabilities, 503
Zigbee technology, 85
zombies, 495