

Numerics

- 1200 series APs, 180–181
- 1400 series bridges, 179
- 4200 series dedicated IDS sensors, 149

A

AAA (Authentication, Authorization, and Accounting), 49, 154

access

- authorization, 102

- remote

- Cisco Easy VPN, 120

- SMB, 42, 49

- restriction of, 102

- wireless, 43–44

- WPA, 167

access control lists (ACLs), 153

access points (APs), 160

- 1200 series, 180–181

- antennae gain, 170

- multi-AP deployments, 168

- overlapping channels, 173

- physical security, 167

- repeater, 169

- rogue, 162

- WLANs, 175–177

accounting, 227. *See also* AAA

accounts, Cisco Unity solution, 253

ACD (Automatic Call Distribution), 227

ACLs (access control lists), 153

action plans in event of breaches, 111

adapters, SAP for ICM, 196

Adaptive Security Algorithm
(ASA), 138

addresses

- IP, 65. *See also* IP

- static addressing VPNs, 119–120

administration

- ACLs, 153

- APs. *See* APs

- BPM, 197

- Cisco Unity solution, 255

- CLM, 197

CRM

- categorization, 192

- Cisco products, 195–198

- commitment, 192–193

- deployment, 189–191

- information accessibility, 191

- integration, 198–206

- selection, 206–212

- SMB interactions, 191

- tools, 193–194

digital document, 16

firewalls, 142

gatekeepers, 227

network-management methods, 80

projects, 28

SCM, 196

SRM, 196

stakeholder requirements, 9–10

VPNs, 125–126

Administrative Workstation (AW), 201

advertising spyware, 91

Agent, 199

AirMagnet, 161

Airsnort, 163

algorithms, ASA, 138

alternate gatekeepers, 239. *See also*
gatekeepers

AMIS (Audio Message Interchange
Specification), 253

amplification of WLANs, 168

analog phones, 228. *See also* IP phones

analysis

- CRM deployment, 193–194

- paths of voice traffic, 219

ANI (Automatic Number Identification), 227

antennas

- Cisco Aironet family of products, 181–182

- directions, 174

- EIRP, 172

- gain, 170

- polarization, 173

- radio frequencies, 173

- regulatory compliance, 171

antidotes (security threats), 105–109

application layers

- gateways, 137

- proxies, 137

- application-derived states, 138
- applications, 80
 - back office/front office integration, 47
 - EAI, 273–275
 - selection, 275–279
 - terminology, 270–273
 - vendors, 279–281
 - BIAs, 275
 - Cisco IP/TV solutions, 261
 - ERP, 47
 - IP IVR, 205
 - IP telephony voice, 242–243
 - virus-scanning, 140
- Apropos, 197
- APs (access points)
 - 1200 series, 180–181
 - antennae gain, 170
 - multi-AP deployments, 168
 - overlapping channels, 173
 - physical security, 167
 - repeater, 169
 - rogue, 161–162
 - WLANs, 175–177
- architecture, JCA, 274
- ASA (Adaptive Security Algorithm), 138
- asset protection, 110–111
- assignment priorities, 20
- attacks. *See also* security
 - brute force dictionary, 152
 - DoS, 93–94
 - e-mail, 99
 - MITM, 164
- attenuation rates, WLANs, 168
- audio, MPEG, 260
- Audio Message Interchange Specification (AMIS), 253
- audits, 106
- authentication, 107–108. *See also* AAA
 - CHAP, 164
 - confidentiality, 107
 - dynamic keys, 166
 - EAP, 164
 - mutual, 164
 - mutual per-port, 166
 - nonrepudiation, 102
 - open, 163
 - PAP, 164
 - troubleshooting, 93
 - WLANs, 166

- Authentication, Authorization, and Accounting (AAA), 49, 154
- authorization, 107–108. *See also* AAA
 - confidentiality, 107
 - granularity, 102
 - VPNs, 116–117
 - branch office connectivity, 126–128
 - Cisco 3000 series concentrators, 130–132
 - deployment, 117–126
 - extranets, 128
 - interorganizational, 130
 - routers, 132–133
 - telecommuters, 129
- Automated Attendant, 243
- Automatic Call Distribution (ACD), 227
- Automatic Number Identification (ANI), 227
- AutoQoS for VoIP, 218
- availability, 70, 108
 - firewalls, 138
 - IP telephony, 218
 - networks, 220–221
 - stakeholder requirements, 17
- Avaya, 197
- AW (Administrative Workstation), 201

B

- back office integration
 - EAI, 273–275
 - selection, 275–279
 - SMB, 47, 50
 - terminology, 270–273
 - vendors, 279–281
- BackboneFast, 61
- backbones, CRB, 195
- backups
 - information integrity, 106
 - system availability, 108
 - VPNs, 121
- bandwidth
 - IP phones, 238
 - IP telephony, 217
 - MPEG, 261
 - single communication infrastructure, 223
 - uplinks, 169

- banks, CRM deployment, 210
- baselines, identification of, 111
- best practices. *See also* troubleshooting
 - security, 104
 - WLANs, 166–167
- BI (business intelligence), 193
- BIAs (Business Integration Applications), 275
- biometric authentication, 108
- bottlenecks, 14
- BPDU (Bridge Protocol Data Unit), 61
- BPM (business process management), 197
- branch offices
 - CRM deployment for banks, 211
 - VPNs, 126–128
- breaches, action plans in event of, 111
- Bridge Protocol Data Unit (BPDU), 61
- bridges
 - 1400 series, 179
 - wireless, 175–177
- Broadcast Servers, IP/TV, 263
- brownouts, 74
- brute force dictionary attacks, 152
- budgets, 24
 - creating, 24
 - measurable performance requirements, 23
- Business Integration Applications (BIAs), 275
- business intelligence (BI), 193
- business missions (SMB), 39–40
- business process management (BPM), 197
- business sectors (SMB), 37–38
- business sizes (SMB), 38–39

C

- cables
 - IP phones, 229
 - TCs, 54–55
 - routers, 62–68
 - switches, 56, 61
- calculations, 173
- call handlers, Unity, 255
- call management settings, Unity, 255
- call routing tables, Unity, 256
- caller-entered digits (CEDs), 201
- calling search spaces, 241
- CallManager, 198, 224
 - Auto Attendant, 243
 - deployment, 236
 - centralized multisite, 240
 - distributed multisite, 237–240
 - single-site, 236
 - dialing plans, 241–242
 - Extended Services, 243
 - gatekeepers, 226, 239
 - integration with legacy PBXes, 240
- CallManager Express (CME), 198, 230
- CallRouter, 199
- capabilities of unified messaging, 251
- CardBus Type II form factor, 182
- cards
 - MRP, 234
 - SPE310, 237
 - VICs, 234
 - VWICs, 234
 - WICs, 234
- Carrier IP telephony solutions, 245–246
- Catalyst 6500 series switches, 225
- categorization, CRM deployment, 192
- CCI (Common Client Interface), 274
- CCK (complementary code keying), 157
- CEDs (caller-entered digits), 201
- Central Controller, 199
- central office (CO) switches, reliability of, 220
- centralization of messages, 253
- centralized multisite CallManager deployment, 240
- Challenge Handshake Authentication Protocol (CHAP), 164
- channels
 - DS, 173
 - nonoverlapping, 168
 - overlapping, 173
- CHAP (Challenge Handshake Authentication Protocol), 164
- CIFS (Common Internet File System), 73
- circuit-level gateways, 137
- circuit-switched SMBs, QoS, 217
- Cisco 3000 series VPN concentrators, 130–132
- Cisco Aironet product family, 178–182
- Cisco Easy VPN remote access, 120
- Cisco ICM Enterprise Edition, 198
- Cisco ICS 7550, 235
- Cisco ICS 7750, 234
- Cisco IDS product lines, 149

- Cisco IP Phones, 244
- Cisco IP video conferencing solution (IP/VC), 259
- Cisco IP/TV solution, 258–265
- Cisco ISP/Carrier IP Telephony solution, 245–246
- Cisco Light EAP (LEAP), 165
- Cisco MCS 7800 series, 233
- Cisco PIX 515 firewall, 135
- Cisco PIX Device Manager (PDM), 142
- Cisco Unity, 243
 - Administrator, 254
 - Assistant, 258
 - solution, 253–258
- Cisco VPN 3000 series scalability, 123
- CiscoWorks VPN/Security Management Solution (VMS), 125
- classes, support, 227
- classrooms, WLAN deployment, 183
- CLI (cryptic command-line interface), 228
- clients
 - CCI, 274
 - wireless, 178
- CLM (Customer Lifecycle Management), 197, 275
- CME (CallManager Express), 198, 230
- CO (central office) switches, reliability of, 220
- coders (coders-decoders), 216
 - IP phones, 238, 244
 - round-trip delay, 219
- coders-decoders (codecs), 216
- collaboration
 - discovery/identification processes, 49
 - SMB partners, 45–46
- commands, enable secret IOS, 152
- Common Client Interface (CCI), 274
- Common Internet File System (CIFS), 73
- communications-derived states, 138
- complementary code keying (CCK), 157
- completion timelines, creating, 25
- components
 - Cisco IP/TV solution, 262
 - of design documents, 31–33
 - TCs, 55
 - WLANs, 171–178
 - APs, 175–177
 - regulatory compliance, 171–175
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177
- compression
 - IP phones, 244
 - IP Telephony, 216
 - MPEG, 260
- computer rooms, 68–69
 - network storage, 70–73
 - power protection, 73–74
 - servers, 69–70
- Computer Telephony Integration (CTI), 197
- Concertro Software, 197
- conference rooms, WLAN deployment, 183
- confidentiality, 107
- configuration
 - CallManager dialing plans, 241–242
 - Cisco 3000 series VPN concentrators, 131
 - firewalls, 142
 - IP Telephony, 215–216
 - gatekeepers, 226–227
 - gateways, 225–226
 - hardware platforms, 224
 - integrated solutions, 231–246
 - IP phones, 228–229
 - open standards protocols, 223–224
 - QoS, 217–222
 - single communications infrastructure, 222–223
 - software-based PBXes, 227–228
 - VoIP, 229–230
 - privilege levels, 152
 - Unity, 256
- connections
 - APs, 162
 - branch offices, 126–128
 - firewalls, 135
 - JCA, 274
 - physical gatekeepers, 226
 - WAN services, 67
- consensus, achieving, 19
- content, Cisco IP/TV solution, 261
- context-based ACLs, 153
- convergence, MCS, 224, 253
- conversion of media signals, 230
- corresponding payback, 192
- corruption of information, 88–90
- costs, 24. *See also* budgets
 - firewalls, 139
 - measurable performance requirements, 23

- stakeholder requirements, 18–19
- switches, 57
- VPNs, 121
- countering perceived threats, 110
- CRB (E.piphany Customer Relationship Backbone), 195
- CRC (cyclic redundancy check), 164
- credit unions, CRM deployment, 210
- CRM (customer relationship management) systems, 47, 189–191
 - categorization, 192
 - Cisco products, 195–198
 - commitment, 192–193
 - information accessibility, 191
 - integration, 198–206
 - selection, 206–212
 - SMB interactions, 191
 - tools, 193–194
- cropped D1, 264
- CRS (Customer Response Solution), 243
- cryptic command-line interface (CLI), 228
- CTI (Computer Technology Integration), 197
- Customer Lifecycle Management (CLM), 197, 275
- customer relationship management (CRM) systems, 47, 189–191
 - categorization, 192
 - Cisco products, 195–198
 - commitment, 192–193
 - information accessibility, 191
 - integration, 198–206
 - selection, 206–212
 - SMB interactions, 191
 - tools, 193–194
- customers. *See also* end users
 - SMB, 46
 - stakeholder requirements, 6, 14–15
- customization
 - CallManager, 236
 - e-mail, 80
 - firewall connections, 135
 - inter-VLAN routing, 62
 - STP, 61
- cyclic redundancy check (CRC), 164

D

- DAS (direct-attached storage), 71
- data centers, 68–69
 - network storage, 70–73
 - power protection, 73–74
 - servers, 69–70
- Database Manager, 199
- database security, 99–101
- dB (decibels), 171
- dBd (dipole antennas), 172
- dB_i (isotropic antennas), 172
- de facto protocol standards, 223
- deadlines, achieving, 25
- decibels (dB), 171
- decryption, dynamic keys, 166
- dedicated high bandwidth, 217
- dedicated routers, 64. *See also* routers
- defaced websites, troubleshooting, 95–97
- delay, round-trip, 218–219
- delineation of threats, 110
- demilitarized zones (DMZs), 46
- denial of service (DoS), 93–94
 - information corruption, 90
 - e-mail, 99
- deployment
 - CallManager, 236
 - dialing plans, 241–242
 - single-site, 236
 - Cisco IP/TV solution, 259
 - CRM, 189–191
 - categorization, 192
 - Cisco products, 195–198
 - commitment, 192–193
 - information accessibility, 191
 - integration, 198–206
 - selection, 206–212
 - SMB interactions, 191
 - tools, 193–194
 - firewalls, 134, 143
 - ICM Enterprise Edition, 202
 - intrusion, 151
 - intrusion detection, 145
 - IP Telephony, 215–216
 - gatekeepers, 226–227
 - gateways, 225–226
 - hardware platforms, 224

- integrated solutions, 231–246
- IP phones, 228–229
- open standards protocols, 223–224
- QoS, 217–222
- single communication
 - infrastructure, 222–223
- software-based PBXes, 227–228
- VoIP, 229–230
- IPCC, 204
- multigateway H.323, 226
- routers
 - security, 151–154
 - TCs, 62–68
- stakeholder requirements, 15
- UMS, 251–252
 - Cisco IP/TV solution, 258–265
 - Cisco Unity solution, 253–258
 - intranets, 266–267
- VPNs, 117–126
 - branch office connectivity, 126–128
 - Cisco 3000 series concentrators, 130–132
 - extranets, 128
 - interorganizational, 130
 - routers, 132–133
 - telecommuters, 129
- WLANs, 182–187
 - best practices (security), 166–167
 - mechanisms (security), 162–166
 - multi-AP, 168
 - optimization of, 168
 - regulatory compliance, 171
 - security, 158–159
 - threats, 159–162
- design
 - document components, 31–33
 - draft design documents, 21
 - final design documents, 26
 - IPCC, 204
 - network-management methods, 80
 - satisfaction of, 9
 - SMB, 41
 - back office/front office integration, 47, 50
 - customer care, 46
 - IP Telephony, 44–45
 - overview of, 83
 - partner collaboration, 45–46
 - remote access, 42
 - security, 42
 - wireless access, 43–44
- stakeholder requirements
 - customer requirements, 14–15
 - end users, 13–14
 - identification, 7
 - IT departments, 10–13
 - output, 16–19
 - vendors, 15–16
- STP, 61
- WLANs
 - APs, 175–177
 - best practices (security), 166–167
 - Cisco Aironet product family, 178–182
 - components, 171–178
 - deployment, 182–187
 - mechanisms (security), 162–166
 - optimization of, 167–170
 - regulatory compliance, 171–175
 - security, 158–159
 - threats, 159–162
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177
- desktop environments, 75
 - movie-quality video to, 259
 - printers, 76
 - workstations, 75
- detection
 - of jitter, 220
 - of wireless eavesdropping, 161
- determination of WLAN topologies, 170
- development
 - document components, 31–33
 - draft design documents, 21
 - EAI, 273
 - final design documents, 26
 - IPCC, 204
 - network-management methods, 80
 - satisfaction of, 9
 - SMB, 41
 - back office/front office integration, 47, 50
 - customer care, 46
 - IP Telephony, 44–45
 - overview of, 83
 - partner collaboration, 45–46
 - remote access, 42

- security, 42
 - wireless access, 43–44
 - stakeholder requirements
 - customer requirements, 14–15
 - end users, 13–14
 - identification, 7
 - IT departments, 10–13
 - output, 16–19
 - vendors, 15–16
 - STP, 61
 - WLANs
 - APs, 175–177
 - best practices (security), 166–167
 - Cisco Aironet product family, 178–182
 - components, 171–178
 - deployment, 182–187
 - mechanisms (security), 162–166
 - optimization of, 167–170
 - regulatory compliance, 171–175
 - security, 158–159
 - threats, 159–162
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177
 - device data, 200
 - device-level VPN management, 125
 - DHCP (Dynamic Handshake Challenge Protocol),
 - disabling, 167
 - Dial Number Identification Service (DNIS), 227
 - dialing plans
 - CallManager, 239, 241–242
 - gatekeepers, 226
 - DID (Direct Inward Dialing), 227
 - digital document management, 16
 - digital signal processing (DSP), 216
 - dipole antennas (dBd), 172
 - Direct Inward Dialing (DID), 227
 - direct sequence (DS) channels, 173
 - direct-attached storage (DAS), 71
 - direction of antennas, 174
 - directory handlers, Unity, 256
 - disabling DHCP, 167
 - disaster recovery plans, 106
 - disclosure of information, 90–92
 - discovery processes
 - SMB, 48–50
 - TED, 119–120
 - DISL (Dynamic ISL), 60
 - distributed multisite CallManager
 - deployment, 237–240
 - distribution of VPNs, 118
 - diversity of messages, UMS, 252
 - division multiplexing (DWDM), 68
 - DMVPN (Dynamic Multipoint IPsec VPN), 120
 - DMZs (demilitarized zones), 46
 - DNIS (Dial Number Identification Service), 227
 - documents, 29–30
 - design components, 31–33
 - digital management, 16
 - draft design, 21, 25
 - final design, 26
 - increases in stakeholders, 8
 - RFC, 20
 - DoS (denial of service), 93–94
 - information corruption, 90
 - e-mail, 99
 - downtime, network availability, 221
 - draft design documents, creating, 21, 25
 - drivers, JCA, 274
 - DS (direct sequence) channels, 173
 - DSP (digital signaling processing), 216
 - DTP (Dynamic Trunking Protocol), 60
 - DWDM (division multiplexing), 68
 - dynamic ACLs, 153
 - Dynamic Handshake Challenge Protocol (DHCP),
 - disabling, 167
 - Dynamic ISL (DISL), 60
 - dynamic keys, encryption, 166
 - Dynamic Multipoint IPsec VPN (DMVPN), 120
 - dynamic packet filtering, 137
 - dynamic routing protocols, 64
 - Dynamic Trunking Protocol (DTP), 60
- ## E
-
- E.piphany CRM solution, 195
 - E.piphany Customer Relationship
 - Backbone (CRB), 195
 - EAI (Enterprise Applications Integration), 273–275
 - EAP (Extensible Authentication Protocol)
 - variants of, 165
 - WLANs, 164
 - EAP-SIM (EAP Subscriber Identity Module), 165
 - EAP-TLS (EAP with Transport Layer Security), 165
 - EAP-TTLS (EAP with Tunneled TLS), 165

- Easy VPN, 120
- eavesdropping, wireless, 160–161
- echoes, IP Telephony, 219
- Effective Isotropic Radiated Power (EIRP), 171
- EIGRP (Enhanced IGRP), 65
- EIRP (Effective Isotropic Radiated Power), 171–173
- electromagnetic waves, 173
- elimination of vendors, 15
- e-mail
 - interception of, 98
 - options, 80
 - UMS integration, 252
- employees, identifying as stakeholders, 6.
 - See also* end users
- enable secret IOS command, 152
- encapsulation
 - GRE, 119
 - IP Telephony, 217
 - TLS Handshake Protocol, 165
 - VLANs, 60
- encryption, 103. *See also* security
 - confidentiality, 107
 - dynamic keys, 166
 - information integrity, 106
 - WLANs, 163
- end users
 - manuals, 30
 - stakeholder requirements, 13–14
- endpoints, 119–120, 225
- Enhanced IGRP (EIGRP), 65
- enhancements
 - document components, 31–33
 - draft design documents, 21
 - EAI, 273
 - final design documents, 26
 - IPCC, 204
 - network-management methods, 80
 - satisfaction of, 9
 - SMB, 41
 - back office/front office integration, 47, 50
 - customer care, 46
 - IP Telephony, 44–45
 - overview of, 83
 - partner collaboration, 45–46
 - remote access, 42
 - security, 42
 - wireless access, 43–44
 - stakeholder requirements
 - customer requirements, 14–15
 - end users, 13–14
 - identification, 7
 - IT departments, 10–13
 - output, 16–19
 - vendors, 15–16
- STP, 61
- VPNs as, 121
- WLANs
 - APs, 175–177
 - best practices (security), 166–167
 - Cisco Aironet product family, 178–182
 - components, 171–178
 - deployment, 182–187
 - mechanisms (security), 162–166
 - optimization of, 167–170
 - regulatory compliance, 171–175
 - security, 158–159
 - threats, 159–162
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177
- Enterprise Applications Integration (EAI), 273–275
- enterprise WLAN deployment, 184–186
- environments
 - desktop, 75
 - printers, 76
 - workstations, 75
- Ephones, 232
- ERP (enterprise resource planning), 47, 196
- Ethernet
 - LRE, 68
 - ports, 237
- evaluation of PERT, 25
- executive management, stakeholder requirements, 9–10
- executive sponsors, 7
- executive summaries, 30
- Extensible Authentication Protocol (EAP)
 - variants of, 165
 - WLANs, 164
- external IT resources, implementing network
 - resources, 27
- external security threats, 21, 101–105
- extranets, VPNs, 128

F

FCC (Federal Communications Commission), 173
 FD1 (Full D1), 263
 Federal Communications Commission (FCC), 173
 filtering static packets, 137
 final design documents, creating, 26
 firewalls. *See also* security
 deployment, 134, 143
 information integrity, 106
 model selection, 143–145
 scalability, 124
 system availability, 108
 fixed-configuration routers, 62. *See also* routers
 fixed-configuration switches, 57. *See also* switches
 Foreign Exchange Office (FXO), 236
 Foreign Exchange Station (FXS), 236
 formatting. *See also* configuration; design;
 optimization
 draft design documents, 21, 25
 final design documents, 26
 formulating budgets, 24
 frequencies
 OFDM, 157
 radio, 173. *See also* RF
 front office integration
 EAI, 273–275
 selection, 275–279
 SMB, 47, 50
 terminology, 270–273
 vendors, 279–281
 Full D1 (FD1), 263
 full mesh topologies, 22
 fully meshed site-to-site VPNs, 119–120
 furniture stores, CRM deployment, 209
 FXO (Foreign Exchange Office), 236
 FXS (Foreign Exchange Station), 236

G

gain, antennae, 170
 gatekeepers
 CallManager, 239
 dial plans, 242. *See also* dialing plans
 H.323, 224
 IP Telephony, 226–227

gateways, 246
 Cisco ISP/Carrier IP Telephony
 solution, 245–246
 IP Telephony, 225–226
 MGC, 230
 multiservice, 234
 GB (gigabytes), 70
 Generic Routing Encapsulation (GRE), 119
 Genesys, 197
 Gigabit Ethernet, 157, 237
 gigabytes (GB), 70
 global administration, Cisco Unity
 Administrator, 255
 Global System for Mobile Communications
 (GSM), 166
 goals of security, 110
 granularity of authorization, 102
 GRE (Generic Routing Encapsulation), 119
 grocery chains, CRM deployment, 208
 groups, IETF, 45
 growth of switches, 58
 GSM (Global System for Mobile
 Communications), 166

H

H.323 gatekeepers, 224–226
 hacking WLANs, 160. *See also* security
 hardening WLAN security, 166
 hardware platforms, 224
 health clinics, CRM deployment, 212
 high-capacity bandwidth, QoS, 217
 higher bit-rate codes, round-trip
 delay, 219
 hops, reducing, 219
 horizontal cable distribution, 54–55
 hospitals, CRM deployment, 212
 HSRP (Hot Standby Routing Protocol), 227
 hub and spoke topologies, 22
 human resources (HR) department intranets, 266
 hybrid dialing plans, 242

I

ICD (Integrated Contact Distribution), 235
 ICM, 200–202

- ICM Enterprise Edition (ICM EE), 199
- ICM product family, 198
- ICS (Integrated Communication System), 224
- ICs (intermediate cross-connects), 54
- ICS 7750, 234–235
- identification processes
 - baselines, 111
 - output, 16–19
 - physical topologies, 22
 - SMB, 48–50
 - stakeholder requirements, 6–16
- IDS (intrusion detection system), 21, 142
 - deployment, 145–151
 - WLANs, 159
- IEC (International Electro-technical Commission), 260
- IEEE 802.11 standard, 157
- IEEE 802.11a AP, 180–181
- IEEE 802.1x standard, 164
- IETF (Internet Engineering Task Force), 45, 223
- IGRP (Interior Gateway Routing Protocol), 65
- implementation
 - final design document creation, 26
 - networking solutions, 26–31
 - project management during, 28
 - router security, 154
 - security policies, 109–112
 - VPNs, 122
- inaccessible websites, troubleshooting, 97
- incompatibilities of IEEE 802.11 standards, 158
- industrial espionage, 91
- information accessibility, CRM deployment, 191
- information confidentiality, 107
- information corruption, 95–97
- information integrity, 105
- information technology. *See* IT
- infrastructure
 - single communications, 222–223
 - VPN enhancements, 121
- in-house analysts, integration, 280
- input, stakeholders, 8
- installation of VLANs, 58
- integrated appliances, 64
- Integrated Communications System (ICS), 224
- Integrated Contact Distribution (ICD), 235
- integrated IP telephone solutions, 231–246
- integrated VPN management, 125
- integration
 - back/front office integration
 - EAI, 273–275
 - selection, 275–279
 - vendors, 279–281
 - BIAs, 275
 - CallManager with legacy PBXes, 240
 - CRM, 198–206
 - CTI, 197
 - firewalls, 139
 - intrusion detection, 149
 - SMB, 47, 50
 - UMS, 252
- integrity
 - information, 105
 - MIC, 164
- interaction, CRM deployment, 191–193
- Interactive Intelligences, Inc., 197
- Interactive Voice Responses (IVRs), 200
- interception of e-mail, 98
- interfaces
 - CCI, 274
 - Central Controller, 200
 - manual, 281
- interference, 168–169
- Interior Gateway Routing Protocol (IGRP), 65
- intermediate cross-connects (ICs), 54
- internal databases, unauthorized access, 99–101
- internal IT resources, 27
- internal security threats, 101–105
- international banks, CRM deployment, 211
- International Electro-technical Commission (IEC), 260
- International Telecommunications Union Telecommunications Standardization Sector (ITU-T), 45
- Internet connectivity, 67
- Internet Engineering Task Force (IETF), 45, 223
- Internet Protocol. *See* IP
- interoperability of open standards, 223–224
- interorganizational VPNs, 130
- interview handlers, Unity, 256
- interviews, stakeholders, 8
- inter-VLAN routing, options, 62
- intranets, 266–267
- intrusion detection system (IDS), 21, 142
 - deployment, 145–151
 - WLANs, 159

investors, identifying as stakeholders, 6
 IOS firewalls, 143–145
 IOS Telephony Services (ITS), 238
 IP (Internet Protocol)
 addresses
 disabling DHCP, 167
 logic, 65
 Telephony
 deployment, 215–216
 gatekeepers, 226–227
 gateways, 225–226
 hardware platforms, 224
 IP phones, 228–229
 open standards protocols, 223–224
 QoS, 217–222
 single communications, 222–223
 SMB, 44–45
 software-based PBXes, 227–228
 integrated solutions, 231–246
 voice applications, 242–243
 VoIP, 229–230
 UMS, 252
 IP Integrated Contact Distribution, 243
 IP Interactive Voice Response, 243
 IP IVR (IP Interactive Voice Response), 205
 IP phones, 228–229, 238, 244
 IP/TV solution, UMS, 258–265
 IP/VC (Cisco IP video conferencing solution), 259
 IPCC (IP Contact Center), 203
 isolation of packets, 137
 isotropic antennas (dBi), 172
 IT (information technology)
 consultants, 280
 help desks, 266
 resources, 27
 stakeholders, 10–13
 ITS (IOS Telephony Service), 238
 ITU-T (International Telecommunications
 Union Telecommunications Standardization
 Sector), 45
 IVRs (Interactive Voice Responses), 200

J

JCA (J2EE Connection Architecture), 274
 jitter, IP Telephony, 219

K

keys, PPK, 164
 keywords
 MAY, 21
 MUST, 20
 MUST NOT, 20
 SHOULD, 20
 kludges, 13

L

lack of security of education, 93
 LANs (local area networks)
 MPEGs, 261
 routers, 62–68
 switches, 56, 61
 VLANs, 49. *See also* VLANs
 LEAP (Cisco Light EAP), 165
 legacy PBXes, CallManager integration
 with, 240
 levels of commitment, CRM, 192–193
 levels of security, WLANs, 169
 LFI (link fragmentation and interleaving), 218
 limitations of wireless communications, 157
 line of business management
 stakeholders, 9–10
 line-of-sight (LOS), 174
 link fragmentation and interleaving (LFI), 218
 links, wireless WAN deployment, 185
 listening devices, WLANs, 160
 live (streaming) video, 258
 local area networks. *See* LANs
 locations
 computer rooms/data centers, 68–69
 network storage, 70–73
 power protection, 73–74
 servers, 69–70
 TCs, 54–55
 routers, 62–68
 switches, 56, 61
 Logger, 199
 logical IP addressing, 65
 Long Reach Ethernet (LRE), 68
 Loop Guard, 61
 LOS (line-of-sight), 174

lower bit-rate codecs, round-trip delay, 219

LRE (Long Reach Ethernet), 68

M

maintenance, 261. *See also* troubleshooting

MAN (metropolitan-area network), 176, 217

man-in-the-middle (MITM) attacks, 164

management

- ACLs, 153

- APs. *See* APs

- BPM, 197

- Cisco Unity solution, 255

- CLM, 197

- CRM

 - categorization, 192

 - Cisco products, 195–198

 - commitment, 192–193

 - deployment, 189–191

 - information accessibility, 191

 - integration, 198–206

 - selection, 206–212

 - SMB interactions, 191

 - tools, 193–194

- digital document, 16

- firewalls, 142

- gatekeepers, 227

- network-management methods, 80

- projects, 28

- SCM, 196

- SRM, 196

- stakeholder requirements, 9–10

- VPNs, 125–126

manual interfaces, 281

manuals, 30

manufacturers, CRM deployment, 211

MAY keyword, 21

MB (megabytes), 70

MCS (Media Convergence Server), 224, 253

- MCS 7800 series, 233

- MCS 7825H-3000, 236

Mean Opinion Score (MOS), 216

mean time between failures (MTBF), 220

mean time to repair (MTTR), 221

measurements

- decibels (dB), 172

- performance requirements, 23

mechanisms, security, 162–166

Media Convergence Server (MCS), 224, 253

- MCS 7800 series, 233

- MCS 7825H-3000, 236

Media Gateway Control Protocol (MGCP), 229

Media Gateway Controller (MGC), 230

media signals, converting, 230

megabytes (MB), 70

Megaco/H.248, 230

memberships, 70

message integrity check (MIC), 164

messages

- AMIS, 253

- centralization, 253

- e-mail. *See* e-mail

- UMS, 251–252

 - Cisco IP/TV solution, 258–265

 - Cisco Unity solution, 253–258

 - intranets, 266–267

- WLANs, 158

 - attenuation rates, 168

 - interference, 168

methods, EAI, 273

metrics, CRM deployment, 193–194

metropolitan-area network (MAN), 176, 217

MGC (Media Gateway Controller), 230

MGCP (Media Gateway Control Protocol), 229

MIC (message integrity check), 164

Microsoft CRM, 197

milliseconds (ms), 218

MITM (man-in-the-middle) attacks, 164

mobile offices, WLAN deployment, 184

mobile users, VPNs, 129

models

- firewalls, 143–145

- intrusion detection systems, 149

modular configuration switches, 57

modular IDS solutions, 149

modular routers, 62, 225

modulations, SS, 162

mom-and-pop shops, CRM deployment, 208

monitoring spyware, 91

MOS (Mean Opinion Score), 216

movie-quality video to the desktop, 259

MPEG (Motion Pictures Expert Group), 260

MRP (Multiservice Route Processor), 234

ms (milliseconds), 218

MTBF (mean time between failures), 220

MTTR (mean time to repair), 221
 multi-AP deployments, 168
 multicarrier systems, OFDM, 157
 multigateway H.323 deployment, 226
 multihoming servers, 69
 multilanguage capabilities, Unity, 254
 multiple gatekeepers, CallManager, 239
 multiple plane (circular or elliptic) electromagnetic waves, 173
 multiplexing

- OFDM, 157
- TDM, 223

 multipurpose security appliances, 141
 Multiservice Route Processor (MRP), 234
 multiservice routers, 234
 multisite banks, CRM deployment, 210
 multivendor environments, 223
 MUST keyword, 20
 MUST NOT keyword, 20
 mutual authentication, 164
 mutual per-port authentication, 166
 MySAP CRM, 196

N

NAS (network-attached storage), 70, 72
 NAT (Network Address Translation), 65
 national banks, CRM deployment, 211
 Network Address Translation (NAT), 65
 Network File System (NFS), 73
 network interface cards. *See* NICs
 Network Interface Controller (NIC), 200–201
 network-attached storage (NAS), 70, 72
 networking options, Unity, 256
 networking solution implementation, 26–31
 network-management methods, 80
 networks

- access restriction, 102
- availability, 108, 220–221
- equipment storage, 54
- LAN
 - MPEGs, 261
 - routers, 62–68
 - switches, 56, 61
 - VLANs, 49. *See also* VLANs

MANs, 176, 217
 packet-based jitter, 220
 physical network segmentation, 103
 power protection, 73–74
 printers, 76
 PSTNs, 44, 217
 SAN, 196
 security, 87

- authentication, 93
- DoS, 93–94, 99
- information corruption, 88–90
- information disclosure, 90–92
- interception of e-mail, 98
- nonrepudiation/repudiation, 92–93
- overview of, 94–95

 segmentation, 103
 server locations, 69–70
 SMB

- back office/front integration, 47, 50
- customer care, 46
- future of, 283
- IP Telephony, 44–45
- partner collaboration, 45–46
- remote access, 42
- security, 42
- wireless access, 43–44

SMB, 42
 storage, 70–73
 UAN, 275
 Unity, 256
 upgrades, 77–79
 VPNs, 46
 WLAN, 43

NFS (Network File System), 73
 NIC (Network Interface Controller), 200
 NICs (network interface cards), 35, 160, 201
 nonoverlapping channels, 168
 nonrepudiation, 92–93, 102, 107–108

O

OC (Optical Carrier)-3, 138
 Octel Communications, 253
 OFDM (orthogonal frequency division multiplexing), 157
 on-demand site-to-site VPN (with TED), 120
 one-size-fits-all approach (SMB), 40–41

- open authentication, 163
- Open Shortest Path First (OSPF), 65
- open standards protocols, 223–224
- operating system (OS), 46
 - antennae, 182
 - availability, 108
- Optical Carrier (OC)-3, 138
- optimization
 - document components, 31–33
 - draft design documents, 21
 - EAI, 273
 - final design documents, 26
 - IPCC, 204
 - network-management methods, 80
 - satisfaction of, 9
 - SMB, 41
 - back office/front office integration, 47, 50
 - customer care, 46
 - IP Telephony, 44–45
 - overview of, 83
 - partner collaboration, 45–46
 - remote access, 42
 - security, 42
 - wireless access, 43–44
 - stakeholder requirements
 - customer requirements, 14–15
 - end users, 13–14
 - identification, 7
 - IT departments, 10–13
 - output, 16–19
 - vendors, 15–16
- STP, 61
- VPNs as, 121
- WLANs
 - APs, 175–177
 - best practices (security), 166–167
 - Cisco Aironet product family, 178–182
 - components, 171–178
 - deployment, 182–187
 - mechanisms (security), 162–166
 - optimization of, 167–170
 - regulatory compliance, 171–175
 - security, 158–159
 - threats, 159–162
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177

- options
 - CallManager, 236
 - e-mail, 80
 - firewall connections, 135
 - inter-VLAN routing, 62
 - STP, 61
- Order Management, 275
- orthogonal frequency division multiplexing (OFDM), 157
- OS (operating system), 46
 - antennae, 182
 - availability, 108
- OSPF (Open Shortest Path First), 65
- output, stakeholders requirements, 16–21
- overlapping channels, 173
- overvoltages, 74

P

- packet-based networks, jitter, 220
- packets
 - IP Telephony, 217
 - PPK, 164
 - static filtering, 137
- PAP (Password Authentication Protocol), 164
- parameters, servers, 70
- partial mesh topologies, 22
- parties, Unity, 256
- partitions, 241
- partner collaboration
 - discovery/identification processes, 49
 - SMB, 45–46
- Partner Relationship Management, 275
- Password Authentication Protocol (PAP), 164
- passwords. *See also* security
 - policies, 102
 - protection, 152
- patch panels, 54–55
- patterns, intrusion detection, 147
- payback, corresponding, 192
- PBX (private branch exchange), 227
- PCA (Personal Communications Assistant), 253
- PCI (Peripheral Component Interconnect), 178
- PDA (personal digital assistants), 178
- PDM (Cisco PIX Device Manager), 125, 142
- PEAP (Protected EAP), 165
- Pegasystems CRM, 197

- PeopleSoft's CRM, 196
- performance. *See also* optimization
 - firewalls, 138
 - measurable requirements, 23
 - OFDM, 158
 - stakeholder requirements, 18
 - testing, 29
 - WLANs, 167–170
- Peripheral Component Interconnect (PCI), 178
- peripherals, 76
- per-packet keying (PPK), 164
- Personal Communications
 - Assistant (PCA), 253
- personal digital assistants (PDAs), 178
- Personal Information Manager (PIM), 88
- PERT (project evaluation and review technique), 25
- PG (Central Controller interface), 200
- phones (IP), 228–229, 244
- physical connections
 - firewalls, 135
 - gatekeepers, 226
- physical network segmentation, 103
- physical obstacles, WLANs, 168
- physical security, 103
 - APs, 167
 - network segmentation, 103
 - system availability, 108
 - WLANs, 159
- physical topology, identifying, 22
- physical uplinks, APs, 162
- PIM (Personal Information Manager), 88
- PIX Device Manager (PDM), 125, 142
- PIX Firewalls, 143–145. *See also* firewalls; security
- plain old telephone service (POTS), 225
- planning
 - CRM, 191
 - EAI, 273
 - ERP, 196
 - upgrades, 77–79
- platforms, hardware, 224. *See also* OS
- Point-to-Point Protocol (PPP), 164
- polarization, antennas, 173
- policies
 - passwords, 102
 - security, 108–112
- POPs (Post Office Protocols), 62
- PortFast, 61
- ports. *See also* connections
 - density, 57
 - FXO, 236
 - FXS, 236
 - Gigabit Ethernet, 237
 - mutual per-port authentication, 166
 - RJ-45, 229
 - switches, 60
 - trunking, 60
 - protocols, 60
 - servers, 70
 - USB, 234
- Post Office Protocols (POPs), 62
- postrouting, 201
- POTS (plain old telephone service), 225
- power protection, 73–74
- power protection equipment, 54
- PPK (per-packet keying), 164
- PPP (Point-to-Point Protocol), 164
- prerouting, 201
- printers, 76
- priorities, assigning, 20
- prioritization, traffic, 220
- priority, QoS, 219
- privacy, WEP, 161, 163, 167
- private branch exchange (PBX), 227
- private IP addressing (RFC 1918), 65
- private networks, 116. *See also* VPNs
- privilege levels, 152
- proactive management, 80
- processing, DSP, 216
- project evaluation and review technique (PERT), 25
- projects
 - management, 28
 - stakeholders, 6
- proprietary protocols, 223
- Protected EAP (PEAP), 165
- protection. *See also* security
 - asset rules, 111
 - firewalls, 136
 - of assets, 110
 - passwords, 152
- protocols, 246
 - DTP, 60
 - dynamic routing, 64
 - gateways, 246
 - HSRP, 227

- IGRP, 65
- MGCP, 229
- open standards, 223–224
- POPs, 62
- proprietary, 223
- RIP, 65
- routing, 154
- SCCP, 229
- STP, 61
- TCP, 138
- trunking, 60
- VoIP, 229–230
- VTP, 60
- WLANs, 159
 - CHAP, 164
 - EAP, 164
 - PAP, 164
 - PPP, 164
 - TKIP, 164
 - TLS Handshake Protocol, 165
- proxy servers, 137
- PSTN (Public Switched Telephone Network), 44, 217
 - echoes, 219
 - gateways, 225

Q

- QoS (quality of service), 216
 - IP Telephony, 217–222
 - WLANs, 176
- quantifiable value, customer categorization, 192

R

- racks, 54
- radio frequency (RF), 44
- RADIUS (Remote Access Dial-In User Service), 164
- reactive management, 80
- realistic completion timelines, creating, 25
- RealSpeak, 254
- receivers
 - SS, 162
 - WLANs, 158
- recovery, information integrity, 106

- redundancy
 - CRC, 164
 - gatekeepers, 227
- Redundant Power System (RPS), 237
- reflexive ACLs, 153
- regulatory compliance, WLANs, 171–175
- relationships
 - business missions, 39
 - CRM, 47
 - categorization, 192
 - Cisco products, 195–198
 - commitment, 192–193
 - deployment, 189–191
 - information accessibility, 191
 - integration, 198–206
 - selection, 206–212
 - SMB interactions, 191
 - tools, 193–194
 - SRM, 196
- reliability
 - of CO switches, 220
 - of transmission media, 218
 - of VPNs, 122
- remote access. *See also* access; connections
 - Cisco Easy VPN, 120
 - discovery/identification processes, 49
 - SMB, 42
- Remote Access Dial-In User Service (RADIUS), 164
- repeater APs, 162, 169
- representative group discussions, stakeholders, 8
- repudiation, 92–93
- Request For Comments (RFC), 20
- requirements
 - measurable performance, 23
 - server availability, 70
 - stakeholders
 - customers, 14–15
 - end users, 13–14
 - identifying, 6–9
 - IT departments, 10–13
 - management, 9–10
 - output, 16–19
 - validating, 19–21
 - vendors, 15–16
- resilience of VPNs, 122–123

resource adapters, JCA, 274
restriction of network access, 102
restriction tables, Unity, 256
retail outlets, CRM selection, 207
return on investment, 57. *See* ROI
reviewing

- draft design documents, 21, 25
- final design documents, 26
- PERT, 25
- security policies, 112

RF (radio frequency), 44

- antennas, 173
- regulatory compliance, 171–175
- surveys, 170

RFC (Request For Comments), 20
RFC 2196 (“A Site Security Handbook”), 112
RIP (Routing Information Protocol), 65
RJ-11 jacks, IP phones, 228
RJ-45 ports, IP phones, 229
rogue APs, 160–162. *See also* APs
ROI (return on investment), switches, 57
Root Guard, 61
round-trip delay, 218–219
route switch module (RSM), 62
routers

- ACLs, 153
- gatekeepers, 226. *See also* gatekeepers
- modular (2600/3600 series), 225
- multiservice, 234
- scalability, 124
- security, 151–154
- TCs, 62–68
- VPNs, 132–133
- wireless, 177

routing

- dynamic protocols, 64
- GRE, 119
- HSRP, 227
- ICM software, 201
- inter-VLAN options, 62

Routing Information Protocol (RIP), 65
RPS (Redundant Power System), 237
RSM (route switch module), 62
rules

- asset protection, 111
- WLANs, 159

running in parallel, 29

S

Sales Management, 275
SANs (storage-area networks), 70, 72, 196
SAP (System Alarm Processor), 235
SAP (Systems, Applications, and Products in Data Processing), 196
satisfaction of design, management decisions, 9
scalability

- CRM, 206
- firewalls, 138
- stakeholder requirements, 17
- VPNs, 122–123

SCCP (Skinny Client Control Protocol), 229
SCM (supply chain management), 196
security

- AAA, 49
- best practices, 104
- CRM, 191
- database unauthorized access, 99–101
- defaced websites, 95–97
- e-mail
 - DoS attacks, 99
 - interception of, 98
- external threats, 21
- firewalls
 - deployment, 134
 - model selection, 143–145
- goals, 110
- IDS, 21
- inaccessible websites, 97
- internal threats, 101–105
- intrusion detection deployment, 145–151
- lack of education, 93
- physical, 103, 108
- policies, 108–112
- routers, 151–154
- SMB, 42, 48
- threats, 87
 - antidotes, 105–109
 - authentication, 93
 - DoS, 93–94
 - information corruption, 88–90
 - information disclosure, 90–92
 - nonrepudiation/repudiation, 92–93
 - overview of, 94–95

- VPNs, 116–117
 - branch office connectivity, 126–128
 - Cisco 3000 series concentrators, 130–132
 - deployment, 117–126
 - extranets, 128
 - interorganizational, 130
 - routers, 132–133
 - telecommuters, 129
- WLANs, 158–159
 - best practices, 166–167
 - levels of, 169
 - mechanisms, 162–166
 - threats, 159–162
- segmentation of networks, 103
- selection
 - CRM, 206–212
 - firewalls, 143–145
 - integration, 275–279
- sensitive information, encryption of, 103
- servers
 - availability, 70
 - Cisco IP/TV solution, 263–264
 - locations, 69–70
 - MCS, 224, 253
 - multihoming, 69
 - network segmentation, 103
 - parameters, 70
 - speed, 70
 - system availability, 108
 - trunk port usage, 70
 - VLAN memberships, 70
- service set identifiers (SSIDs), 161
- services
 - reducing level of, 15
 - support, 227
 - unavailability, 221
 - WAN Internet connectivity, 67
- shared infrastructures, 116. *See also* VPNs
- sharing bandwidth (uplinks), 169
- SHOULD keyword, 20
- signals
 - converting, 230
 - DSP, 216
- single communications infrastructure, 222–223
- single plane (linear) electromagnetic waves, 173
- single-site CallManager deployment, 236
- single-site community banks, 210
- single-vendor solutions, 224
- site dial plans, 242. *See also* dialing plans
- site-to-site VPNs, 119–120
- Skippy Client Control Protocol (SCCP), 229
- small office WLAN deployment, 183
- small office/home office. *See* SOHO,
- SMB (small medium business), 35
 - customer care, 50
 - design, 41
 - back office/front office integration, 47, 50
 - customer care, 46
 - IP Telephony, 44–45
 - partner collaboration, 45–46
 - remote access, 42
 - security, 42
 - wireless access, 43–44
 - future of, 283
 - identification/discovery processes, 48–50
 - overview of, 83
 - business missions, 39–40
 - business sectors, 37–38
 - business sizes, 38–39
 - one-size-fits-all approach, 40–41
 - partner collaboration, 49
 - remote access, 49
 - security, 48
- softswitches, 230
- software-based PBXes, 227–228
- SOHO (small office/home office), 36
- solutions
 - executive sponsors, 8
 - networking, 26–31
 - WLANs, 158
- SPE (System Processing Engine), 234
- SPE310 cards, 237
- speed
 - servers, 70
 - switches, 57
- spread spectrum (SS), 162
- spyware, 91
- SRM (supplier relationship management), 196
- SRST (Survivable Remote Site Telephony), 240
- SS (spread spectrum), 162
- SSIDs (service set identifiers), 161–163
- SSP (System Switch Processor), 235
- stages, identifying stateholder requirements, 8

- stakeholder requirements
 - customers, 14–15
 - end users, 13–14
 - identifying, 6–9
 - IT departments, 10–13
 - management, 9–10
 - output, 16–19
 - validating, 19–21
 - vendors, 15–16
- standards, open standards protocols, 223–224
- Starter Server, IP/TV, 263
- stateful inspection firewalls, 137
- static addressing VPNs, 119–120
- static IP addresses, 167
- static packet filtering, 137
- storage, 70–73
- storage-area networks (SANs), 70, 72, 196
- streamlining vendor interactions, 15
- strong authentication, 102
- subscribers, Unity, 253, 255–256
- supplier relationship management (SRM), 196
- supply chain management (SCM), 196
- surveys
 - RF, 170
 - stakeholders, 8
- Survivable Remote Site Telephony (SRST), 240
- switches
 - Catalyst 6500 series, 225
 - CO, 220
 - port
 - density, 57
 - uplinks, 60
 - speed, 57
 - STP, 61
 - TCs, 56, 61
- Synchronizer, 199
- synchronous end-to-end transmissions, jitter, 220
- Synergex, 279
- System Alarm Processor (SAP), 235
- system availability, 108
- system contracts, JCA, 274
- System Processing Engine (SPE), 234
- System Switch Processor (SSP), 235
- Systems, Applications, and Products in Data Processing (SAP), 196

T

- TAC (Technical Assistance Center), 234
- targets, WLANs as, 160
- TB (terabytes), 70
- TCO (total cost of ownership), 19, 139
- TCP (Transmission Control Protocol), 138
- TCs (telecommunication closets), 54–55
 - routers, 62–68
 - switches, 56
- TDM (Time Division Multiplexing), 223
- Technical Assistance Center (TAC), 234
- TED (Tunnel Endpoint Discovery), 119–120
- telcos (telephone companies), 220
- telecommunications closets. *See* TCs
- telecommuters
 - branch office VPNs, 128
 - VPNs, 129
 - WLAN deployment, 186
- telephone companies (telcos), 220
- Telephony (IP)
 - deployment, 215–216
 - gatekeepers, 226–227
 - gateways, 225–226
 - hardware platforms, 224
 - IP phones, 228–229
 - open standards protocols, 223–224
 - QoS, 217–222
 - single communication
 - infrastructure, 222–223
 - software-based PBXes, 227–228
 - VoIP, 229–230
 - integrated solutions, 231–246
 - SMB, 44–45
 - voice applications, 242–243
- Temporal Key Integrity Protocol (TKIP), 164
- terabytes (TB), 70
- termination (TCs), 54–55
 - routers, 62–68
 - switches, 56, 61
- testing. *See also* troubleshooting
 - Cisco IP/TV solution, 261
 - performance, 29
- text-to-speech (TTS), 254

- threats (security), 87
 - antidotes, 105–109
 - authentication, 93
 - delineation of, 110
 - DoS, 93–94
 - external/internal, 21, 101–105
 - information corruption, 88–90
 - information disclosure, 90–92
 - nonrepudiation/repudiation, 92–93
 - overview of, 94–95
 - solutions for, 110
 - WLANs, 159–162
 - Time Division Multiplexing (TDM), 223
 - timelines, creating, 25
 - TKIP (Temporal Key Integrity Protocol), 164
 - TLS Handshake Protocol, 165
 - toll quality, 216–217
 - tools
 - CRM deployment, 193–194
 - EAI, 273
 - wireless eavesdropping detection, 161
 - topologies
 - full mesh, 22
 - hub and spoke, 22
 - partial mesh, 22
 - physical, 22
 - violations, 13
 - VPNs, 118
 - WLANs, 167–170
 - total cost of ownership (TCO), 19, 139
 - traffic
 - intrusion detection, 147
 - prioritization, 220
 - voice, 219
 - training, 30–31
 - transactions, VRM, 190
 - Transmission Control Protocol (TCP), 138
 - transmissions
 - electromagnetic waves, 173
 - WLANs, 159
 - SS, 162
 - wireless eavesdropping, 160
 - transmit power, 171–175
 - transmitters
 - SS, 162
 - WLANs, 158
 - trigger mechanisms, policy
 - reviews/updates, 112
 - troubleshooting
 - Cisco IP/TV solution, 261
 - defaced websites, 95–97
 - echo/jitter, 219
 - e-mail
 - DoS attacks, 99
 - interception of, 98
 - inaccessible websites, 97
 - round-trip delay, 218
 - security, 105–109
 - virus-scanning applications, 140
 - VPNs, 122
 - wireless eavesdropping detection, 161
 - WLANs, 168–169
 - trunking, 60
 - ports, 70
 - protocols, 60
 - TTS (text-to-speech), 254
 - TTS3000 (SoftScan), 254
 - Tunnel Endpoint Discovery (TED), 119–120
- ## U
-
- UAN (Universal Applications Network), 275
 - UMS (unified messaging solutions), 251
 - Cisco IP/TV solution, 258–265
 - Cisco Unity solution, 253–258
 - deployment, 251–252
 - intranets, 266–267
 - unauthorized access, databases, 99–101
 - unified communications solutions, 249
 - Unified Messaging, 243
 - unified messaging solutions. *See* UMS
 - UNII (Unlicensed National Information Infrastructure), 173
 - uninterruptible power supply (UPS), 74, 237
 - Unity Inbox, 258
 - Unity solution, UMS, 253–258
 - Universal Applications Network (UAN), 275
 - universal serial bus (USB), 178, 234
 - university library wireless deployment, 185
 - Unlicensed National Information Infrastructure (UNII), 173

- updates, 112, 221
- upgrades
 - planning, 77–79
 - VPNs, 121
- UplinkFast, 61
- uplinks
 - APs, 162
 - bandwidth sharing, 169
 - switch ports, 60
- UPS (uninterruptible power supply), 74, 237
- USB (universal serial bus), 178, 234

V

- validation, stakeholder requirements, 19–21
- Variable Length Subnet Masking (VLSM), 64
- variants of EAP, 165–166
- VAs (volt amperes), 74
- vendors
 - eliminating, 15
 - integration, 279–281
 - stakeholder requirements, 6, 15–16
- VICs (voice interface cards), 234
- video
 - deployment, 259
 - MPEG, 260
- video capture cards, IP/TV, 263
- video on demand (VoD), 259
- violations, topologies, 13
- Virtual LANs. *See* VLANs
- virtual private network. *See* VPN
- virus-scanning applications, firewalls, 140
- Visual Messaging Interface, 243
- VLAN Trunking Protocol (VTP), 60
- VLANs (Virtual LANs), 49
 - encapsulation, 60
 - inter-VLAN routing options, 62
 - memberships, 70
 - switches, 58
- VLSM (Variable Length Subnet Masking), 64
- VMS (CiscoWorks VPN/Security Management Solution), 125
- VoD (video on demand), 259
- voice
 - applications (IP Telephony), 242–243
 - gateways, 234
 - IP IVR, 205

- IP Telephony, 216
- IVRs, 200
- messages, 168
- UMS, 252
- voice interface cards (VICs), 234
- Voice Messaging, 243
- Voice Profile for Internet Mail (VPIM), 253
- Voice Response Units (VRUs), 200
- voice/WAN interface cards (VWICs), 234
- VoIP (Voice over IP), 45, 229–230
- voltage spikes, 74
- volt amperes (VAs), 74
- volume, UMS, 252
- VPIM (Voice Profile for Internet Mail), 253
- VPNs (virtual private networks), 46
 - backups, 121
 - encryption, 103
 - enhancements, 121
 - firewalls, 141
 - hardware client (VPN 3002), 124
 - implementation, 122
 - management, 125
 - security, 116–117
 - branch office connectivity, 126–128
 - Cisco 3000 series concentrators, 130–132
 - deployment, 117–126
 - extranets, 128
 - interorganizational, 130
 - routers, 132–133
 - telecommuters, 129
 - software client scalability, 124
- VTP (VLAN Trunking Protocol), 60
- VWICs (voice/WAN interface cards), 234

W–Z

- WAN (wide area network)
 - CRM, 191
 - distributed multisite CallManager
 - deployment, 238
 - MPEGs, 261
 - routers, 62–68
 - services, 67
 - wireless link deployment, 185
- WAN interface cards (WICs), 234
- warchalking, 161

- wardriving, 161
- warehouses, WLAN deployment, 184
- Web Services, 274
- Web sites, 285
 - defaced, 95–97
 - inaccessible, 97
- WEP (wired equivalent privacy), 161, 163, 167
- WICS (WAN interfaces cards), 234
- wide area network. *See* WAN
- Wi-Fi Protected Access (WPA), 167
- wired equivalent privacy (WEP), 161
- wireless access, 43–44
- wireless bridges, 175–177
- wireless clients, 178
- wireless eavesdropping, 160–161
- wireless local-area networks. *See* WLANs
- wireless routers, 177
- wireless WAN link deployment, 185
- WLANs (wireless local-area networks), 43, 157
 - Cisco Aironet product family, 178–182
 - components, 171–178
 - APs, 175–177
 - regulatory compliance, 171–175
 - wireless bridges, 175–177
 - wireless clients, 178
 - wireless routers, 177
 - deployment, 182–187
 - performance, 167–170
 - QoS, 176
 - security, 158–159
 - best practices, 166–167
 - levels of, 169
 - mechanisms, 162–166
 - threats, 159–162
- work-area cabling, 55
- workforce distribution, VPNs, 118
- workgroups, WLAN deployment, 183
- workstations, 75
- WPA (Wi-Fi Protected Access), 167, 180