

- IP (Internet Protocol) (*continued*)
 datagrams, 242, 332–338
 de facto standard for internetworking, 512
 Internet addressing and forwarding, 331–363
 multicasting, 593
 network layer, 305–307, 332
 pervasiveness, 431
 routers, 53
 security, 362–363
 separation from TCP, 62
 IP multicast, 412
 IPng (Next Generation IP), 356
 IP protocol version 4. *See* IPv4
 IP protocol version 6. *See* IPv6
 IPsec, 362, 72–724
 IPS (intrusion prevention system), 355, 740
 IP spoofing, 59–60, 701
 IP subnet, 541–542
 IP tunnels, 303
 IPTV, 87
 IPv4 addresses, 334, 356
 IPv6 addresses, 356, 512
 IPv4 addressing, 338–352
 IPv4 datagrams, 332–335
 format, 306
 IPv6 datagrams, 356–359
 IPv4 header, 636–637
 IPv6 header, 359
 IPv4 (IP protocol version 4), 160, 165,
 331, 336
 IPsec, 362
 transitioning to IPv6, 359–362
 IPv6 (IP protocol version 6), 306, 332,
 356–362
 dual-stack approach, 360
 flow labeling and priority, 357
 IP addresses, 351, 356
 transitioning from IPv4, 359–362
 tunneling, 360–361
 IPv6/IPv4 nodes, 359–360
 IS-IS (Intermediate-System-to-
 Intermediate-System), 405, 498
 IS-IS protocol, 384
 ISO (International Organization for
 Standardization), 52, 758, 770
 ISPs (Internet Service Providers), 32–35
 access networks, 12–18
 ASs (autonomous systems), 383
 customer-provider relationship, 33
 end-to-end service, 651–652
 global transit, 32
 low-tier and upper-tier, 5
 multi-homing, 33–34
 naming and addressing conventions, 5
 obtaining set of addresses from, 345
 peer, 34
 peering agreements, 399
 iterative queries, 137–138
 ITU-T (International Telecommunication
 Union), 699, 770
 IXPs (Internet exchange points), 33, 34
- J**
 Jacobson, Van, 302, 303, 584
 Java and client-server programming, 157
 jitter, 614–618
- K**
 Kademlia DHT, 156
 Kahn, Robert, 62, 231, 431–432, 511
 KanKan, 87, 588, 611–612
 key derivation, 713–714
 key management, 726
 Kleinrock, Leonard, 60–62, 80–82, 431, 511
 known-plaintext attack, 677
- L**
 label-switched routers, 488
 Lam, Simon S., 511–512
 LANs (local area networks), 16
 broadcast address, 464
 configured hierarchically, 482–483
 Ethernet, 470
 hub-based star topology, 470
 MAC address, 463
 switches, 17, 470, 475, 483, 496
 VLANs (virtual local area networks),
 482–486