

Networks Review Sheet #1

- Terms (p1--34): hosts, end systems, communication links, transmission rate, packets, routers, switches, ISPs, customers, providers, Points of Presence, protocols, API, clients, server, dial-up, DSL, cable, Fiber, WiFi, physical media, twisted-pair copper wire, coaxial cable, fiber optics, radio (terrestrial or satellite), trace route (p43), IP spoofing(p60)
- Terms/Malware (p57--58) malware, botnet, self-replicating, Virus, Worm, Trojan Horse
- Terms/Attacks (p58-61) Denial of Service, Vulnerability Attack, Bandwidth Flooding, Connection Flooding, IP spoofing, man-in-middle attacks
- (p37) Delays, Nodal Processing, Queuing, Transmission, Propagation, Total Nodal Delay, Toll Booth Analogy
- (p42) Dropped packets, packet loss
- (p51--53) Protocol Layering
- Internet Protocol Stack
 - Application - messages
 - Transport (TCP/UDP) - segments
 - Network (IP) - datagrams
 - Link (ethernet/PPP) - frames
 - Physical (see above)
- Each layer adds its own header
- Application Layer
 - (85--87) client-server, examples, advantages, disadvantages
 - (88-89) P2P - examples, advantages, disadvantages
 - (p90--91) download vs upload, sockets
 - (p92-93) Developer uses an API, chooses transport protocol and some other parameters, with reliability, throughput, timing and security in mind
 - (p94--96) TCP (connection-oriented, reliable, handshake, congestion control) vs UDP (connection-less, light-weight, no guarantees)
 - (p97) examples of TCP, UDP applications
 - (p98) IP addresses
 - (p98) Application-layer protocols
 - (p103-104) Persistent vs non-persistent connections
 - (p113-117) Proxy server, web cache, latency measures

- (p124-129) SMTP, POP3, IMAP
- (p126) push vs pull protocols
- (p132-143) DNS, hostname, UDP 53, centralized vs. distributed, local DNS servers, Resource Records, format of DNS request and reply

- Socket programming in C (homework and see shared pdf)

Sample Homework, Discussion and other Problems

Chapter 1:

Review: 2-4, 7-10, 16, 18-20, 22-28

Problems: 4-6,11,12,21,23

Discussion: 6, 7, 9-13

Chapter 2:

Review: 1-9, 10, 11, 13, 14, 16-19

Problems: 1,3-5,7-9, 18

Discussion: 1, 3-7, 9