

Midterm Review

- I. Introduction
 - A. Definitions
 - 1. network vs distributed system
 - 2. network components
 - a. core versus edge, end-to-end versus sub-network
 - 3. paradigms
 - a. client-server
 - b. peer-to-peer (P2P)
 - c. wireless versus mobile
 - B. Classify Networks
 - 1. transmission technology - broadcast, multicast, point-to-point
 - 2. size - LAN, MAN, WAN
 - 3. topology - star, ring, tree, hierarchical
- II. Elementary TCP Sockets
 - A. Client/server model
 - B. structure of `sockaddr_in`
 - C. socket functions
 - 1. *socket*
 - 2. *connect*
 - 3. *bind*
 - 4. *listen*
 - 5. *accept*
 - 6. *close*
- III. Network Architecture
 - A. Seven Layer ISO OSI Reference Model
 - 1. Protocol
 - B. Introduction to TCP/IP Protocol Stack
 - 1. IPv4, IPv6
 - 2. encapsulation
- IV. Switching
 - A. circuit switching
 - B. message switching
 - C. packet switching
 - D. cell switching
 - E. Store-and-Forward Networks
 - 1. cut-through routing
 - 2. virtual circuit networks
 - 3. datagram networks
 - 4. connectionless versus connection-oriented networks
- V. Network Performance
 - A. Generic performance measures
 - 1. throughput
 - 2. utilization

- 3. response time
 - B. end-to-end delay
 - 1. processing delay at the node
 - 2. Queueing delay
 - 3. Propagation delay
 - 4. Transmission delay
 - C. latency, goodput, fairness
 - D. delivery ratio, packet loss rate, retransmission rate
- VI. Physical Layer
- A. Definitions
 - 1. baud {modulation rate}
 - 2. data rate {capacity}
 - 3. bandwidth
 - 4. voice-grade line
 - B. Analog vs Digital
 - 1. signals
 - 2. attenuation
 - 3. modem
 - C. Multiplexing
 - 1. TDM
 - a. T1 line
 - 2. FDM
 - 3. statistical multiplexing {concentrator}
 - 4. WDM
 - D. Transmission Media
 - 1. twisted pair
 - a. UTP Cat 3,5,5e
 - b. Dial Up Modem
 - c. ADSL
 - 2. Coaxial cable
 - a. baseband
 - i. 10BASE2 {did not cover}
 - ii. 10BASE5 {will cover now!!}
 - b. broadband {CATV}
 - c. HFC (Hybrid Fiber-Coax)
 - 3. Optical Fiber
 - a. FTTH
 - b. PON
 - i. FIOS
 - 4. Radio transmissions
 - a. 802.11 (WiFi)
 - b. Cellular EVDO
- VII. Application Layer
- A. TCP versus UDP

VIII. HTTP

A. Web Terminology

1. object, base-HTML page, URL

B. HTTP Overview

1. uses TCP, port 80
2. stateless

C. Connections

1. non-persistent
2. persistent

D. HTTP Request Message

E. HTTP Response Message

F. Cookies

G. Web Caching (Proxy Server)

IX. DNS

X. Introduction to Security