

Final Review

----- *Mid Term Ended Here* -----

- V. Medium Access Sublayer (MAC)
 - A. "The Channel Allocation Problem"
 - 1. assumptions
 - B. LAN Performance Notation
 - 1. relative propagation time - α
 - 2. S, I, and G {throughput, input load, offered load}
 - C. ALOHA
 - D. Slotted ALOHA
 - E. CSMA
 - 1. non-persistent
 - 2. 1-persistent
 - 3. p-persistent
 - F. CSMA/CD
 - G. Ethernet
 - 1. binary exponential backoff
 - 2. Ethernet evolution (10Base5, 10Base2, 1Base5, 10BaseT)
 - H. Switched Ethernet
 - 1. backward learning
- VI. Wireless LANs
 - A. Classification
 - 1. Infrastructure
 - 2. Ad Hoc
 - 3. MANET
 - B. 802.11 Protocols
 - 1. infrared
 - 2. FHSS
 - 3. DHSS
 - 4. 802.11a
 - 5. 802.11b
 - 6. 802.11g
 - C. MAC Sublayer
 - 1. Hidden Terminal Problem
 - 2. Exposed Station Problem
 - 3. DCF
 - a. CSMA/CA
 - i. MACA
 - ii. RTS/CTS
 - ii. MACAW with Virtual channel sensing
 - iv. 1-persistent physical carrier sensing
 - 4. Frame fragmentation
 - 5. PCF
 - a. beacon frame
 - 6. Implementation Details

- a. dynamic rate adaptation
- VII. Wireless Measurement
 - A. *"Characterization of 802.11 Wireless Networks in the Home"*
 - B. *"Distributed Dynamic Channel Selection in Chaotic Wireless Networks"*
- VIII. LAN Leftovers
 - A. Bridges
 - 1. backward learning
 - 2. collision domains
 - 3. loops
 - a. transparent bridges (spanning trees)
 - b. source routing bridges
 - B. Token Ring
 - 1. token insertion choices
 - 2. 802.5 token ring
 - 3. performance compared to Ethernet
 - 4. advantages vs disadvantages
 - a. token maintenance problems
- IX. High Speed LANs
 - A. FDDI
 - 1. differences from 802.5 token ring
 - 2. 4B/5B encoding
 - 3. dual ring
 - 4. TTRT
 - B. Fast Ethernet
 - 1. 100 Base T4
 - a. four twisted pairs
 - b. 8B/6T encoding
 - c. 33-1/3 Mbps per pair
 - 2. 100 Base TX
 - 3. 100 Base FX
 - C. Gigabit Ethernet
 - 1. Fiber Channel technology
 - 2. 8B/10B encoding
 - 3. 1000 Base SX
 - 4. 1000 Base LX
 - 5. 1000 Base CX
 - 6. 1000 Base T
 - 7. carrier extension
 - 8. frame bursting
 - 9. buffered distributor
- X. SONET
 - A. optical fiber standard
 - 1. common master clock
 - 2. byte interleaved TDM
 - B. SONET architecture
 - 1. ADM - add/drop multiplexor

2. REG - regenerator for optical signals
3. section/line/path
- C. SONET frame
 1. SPE Synchronous Payload Envelope
 2. Overhead
- D. Multiplexing hierarchy
 1. up to STS-3 and beyond
 2. down to virtual tributaries
- XI. ATM {Asynchronous Transfer Mode}
 - A. Basics
 1. 53 byte cell-switching technology
 2. virtual circuits
 - B. Conceptual Model Assumptions
 - C. Header Details
 1. UNI versus NNI
 2. VPI/VCI
 - D. Architecture
 1. variety of traffic types
 - a. original four types
 - b. revised traffic types
 2. AALs
 - a. AAL1
 - b. AAL3/4
 - c. AAL5
 3. CS and SAR sublayers
 - E. Cell Switching Issues
 1. cells not reordered
 2. non-blocking switches
 3. PVCs versus SVCs
- XII. Network Layer
 - A. Routing
 1. Non-Adaptive
 - a. flooding
 - b. static
 - i. Dijkstra's Shortest Path routing algorithm
 2. Adaptive
 - a. centralized RCC
 - b. distributed
 - i. intradomain routing
 - ii. interdomain routing
 - c. isolated
 3. Distance Vector Routing
 - a. RIP
 4. Link State Routing
 - a. OSPF
 5. Border Gateway Protocols (BGP)

- XIII. Transport Layer
 - A. TCP Sliding Windows
 - 1. advertised window
 - B. TCP Congestion Control
 - 1. router congestion notification
 - 2. congestion window (cwnd)
 - 3. AIMD
 - a. congestion avoidance
 - 4. slow start
 - 5. fast retransmit
 - 6. fast recovery
 - 7. TCP Tahoe vs. TCP Reno

----- *Final Covers up to Here* -----