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 - **a**
  - 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

VII. Wireless Measurement
A. Performance Measurement Approaches {covered in video}
1. analytic models, simulation models, empirical measurement
A. "Performance Analysis of the Intertwined Effects between Network Layers for 802.11g Transmissions"
B. "Characterization of 802.11 Wireless Networks in the Home"
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

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

4. fast recovery
5. TCP Tahoe vs. TCP Reno