

CS118 Computer Network Fundamentals

Section 9

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Friday 4-3:30PM BH2444

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- **NO** discussion section next week (June 3rd)
 - if you have questions
 - Come to office hours
 - Send me emails
- Final exam on **June 4th**
- Project 2 due **June 7th**

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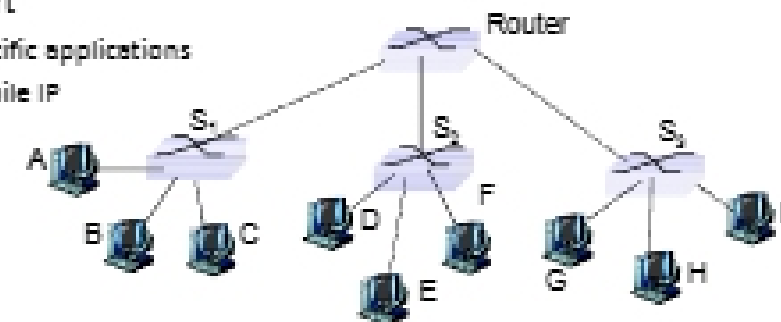
This Week

- Multiple Access
 - ALOHA
 - Slotted ALOHA
 - Ethernet (CSMA/CD)
 - How does it work
 - Frame format
- Wireless
 - Hidden terminal problem
 - 802.11 (wifi)
 - CSMA/CA
 - DIFS / SIFS + ACK
 - RTS / CTS
 - Frame format
- Inter-connecting
 - Hub
 - Switch
 - Router

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ARP Proxy

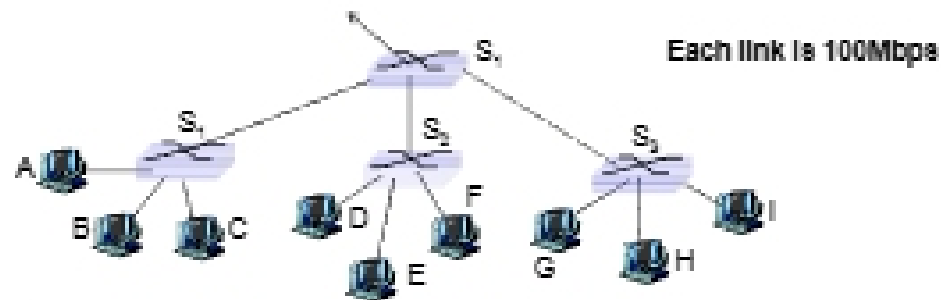
- Use “Router” as a ARP proxy
 - Hosts are in
 - Different physical networks
 - Same IP network
 - Support
 - Specific applications
 - Mobile IP



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Discussion Problems

- Ch5. P23/24 (Inter-connecting)



Question

1. What is the aggregate egress throughput if S1, S2, S3 are replaced by switches?
2. What is all switches are replaced?
3. Consider the efficiency equation...

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Homeworks

- Homework #7
 - Review
- Homework #8
 - Points
 - CSMA/CD
 - CSMA/CA
 - Questions?

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Final Review

- End-to-end delays
 - Types of delay
 - Calculation
- HTTP
 - Parallel / Persistent
 - (DNS) + TCP + HTTP
 - Consider the pack sizes
- DNS
 - Query operations
 - Delay
 - Number of rounds
 - With or without cache
 - What is in the cache?
- Other applications
 - FTP, EMAIL, P2P

+ New concerns: retransmissions, backoff, ARP request, switch forwarding ...

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Final Review

- Transport protocols
 - Multiplex / Demultiplex
 - Different services provided
- Reliable transfer
 - Types of errors and recovery
 - SW, GBN, SR
 - Utilization calculation
- UDP
 - Message format
 - Checksum
- TCP
 - Message format
 - Flags
 - Seq and Ack
 - Flow control and Congestion control
 - RTT calculation
 - RTT estimation
 - RTT backoff
 - Samples

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Final Review

- IP
 - IP (v4/v6) header format
 - Length, TTL
 - Fragmentation
 - IP address
 - Address class (A,B,C,D)
 - Subnet and CIDR
 - ICMP
 - ping and traceroute
 - Forwarding
 - Longest prefix match
- Routing
 - LS and DV
 - How do they work?
 - What to do with link change?
 - Split Horizon and poison reverse
 - RIP and OSPF
 - How do they work?
 - Comparison
 - BGP
 - Path vector
 - Policy routing
 - AS relationship
 - Routing preference

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Final Review

- Broadcast
 - Flooding / RPF
 - Span-tree
- Multicast
 - IGMP
 - DVMRP, MOSPF, PIM-DM, PIM-SM
(Membership and forwarding)
- Data Link Layer
 - Frame format
 - Preamble
 - Byte stuffing
 - Error detection
 - ARP
- Multiple Access
 - Unique address
 - Flat 48bit MAC address
 - 3 types of protocol

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Final Review

- Random Access Protocol
 - (Slotted) ALOHA
 - CSMA/CD
 - How do they work
 - How to sense
 - How to backoff
 - Efficiency
- Inter-networking
 - Router, switch, and hub
 - Self-learning switch table
 - Important!
- Wireless
 - CSMA/CA
 - Why and How
 - Frame format
- Mobility
 - L2 mobility
 - mobile IP
 - Agents
 - Tunnels

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Any questions?

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