Computer Networks
EE357

Final Review

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The slides are adapted from those provided by Prof. J.F Kurose and K.W. Ross.

Chapter 1 Introduction

- Internet overview
  - "nuts and bolts" view, a service view,
- what's a protocol?
- network edge, core, access network
  - Bandwidth vs Data Rate
  - DSL vs Cable Modem
  - packet-switching versus circuit-switching
- Internet/ISP structure
- performance: loss, delay, throughput
- protocol layering and service models

Chapter 2 Application Layer

- Application architectures
  - client-server, P2P, hybrid
- application service requirements:
  - reliability, bandwidth, delay
- Internet transport service model
  - connection-oriented, reliable: TCP
  - unreliable, datagrams: UDP

- specific protocols:
  - HTTP
  - FTP
  - SMTP, POP, IMAP
  - DNS
- Cookies, Web caches
- socket programming

Chapter 3 Transport Layer

- principles behind transport layer services:
  - multiplexing, demultiplexing
  - reliable data transfer
  - flow control
  - congestion control
- instantiation, implementation in the Internet
  - UDP
  - TCP (segment structure, reliable data transfer, flow control, connection management, congestion control)

Chapter 4 Network Layer-Data Plane

- Overview of Network layer: data plane and control plane
- What's inside a router
- IP: Internet Protocol
  - datagram format
  - fragmentation
  - IPv4 addressing
  - NAT
  - IPv6

Chapter 5 Network Layer-Control Plane

- approaches to network control plane
  - per-router control (traditional)
  - logically centralized control (software defined networking)
- routing protocols
  - link state
  - distance vector
- intra-AS routing: OSPF
- inter-AS routing: BGP
- Internet Control Message Protocol
- network management

Chapter 6 Link Layer

- principles behind data link layer services:
  - error detection, correction
  - sharing a broadcast channel: multiple access
    - Time Division, Frequency Division
    - Aloha, CSMA, CSMA/CD
  - link layer addressing
- instantiation and implementation of various link layer technologies
  - Ethernet
  - switched LANS, VLANs

Chapter 7 Mobile and Wireless Networks

Elements of a wireless network
Wireless Link Characteristics
IEEE 802.11 ("Wi-Fi")
cellular access
    architecture
    standards (e.g., 3G, 4G LTE)
Mobility

Final Review Guidelines-Materials

- **Slides**
- **Homeworks**
- **Books**
- **Candidate Topics on our course website**

Very best of luck to your final exam !