CMPE 150/L: Introduction to Computer Networks

Computer Engineering

UCSC Baskin Engineering

Midterm Highlights

Chapter 1: Concepts and Terminology

- Definition of computer networks.
- Computer network components.
- Examples of networks.
- Why network? Why not?
- The Internet
  - Components: links, end hosts, and routers.
  - Collection of interconnected networks
- The Internet's structure: hierarchical
  - Network edge.
  - Access networks.
  - Network core.

Chapter 1: Concepts and Terminology

- Protocols.
- Circuit switching.
  - TDM.
  - FDM.
- Packet switching.
  - Statistical multiplexing.
- Layering.
- Internet protocol stack.
- Encapsulation.
- De-encapsulation.
- Network performance:
  - Delay/latency.
  - Loss.
    - Transmission losses.
    - Congestion losses.
  - Throughput.
- Internet structure.

Chapter 2: Application Layer

- Application models:
  - Client-server.
  - Peer-to-peer.
  - Hybrid.
- Application process.
- Application-layer protocol.
- Addressing:
  - Flat.
  - Hierarchical.
- Application addresses.
  - Ports.
- Web and HTTP.
  - Terminology.
  - HTTP.
  - Persistent HTTP.
  - Non-persistent HTTP.
  - Web caching.
- DNS.
  - Function.
  - Centralized versus distributed.
  - DNS database.
  - Name servers.
  - Name resolution.
  - DNS caching.

Chapter 3: Transport Layer

- Transport layer services.
- Multiplexing and de-multiplexing.
- UDP.
- Principles of reliable data transfer.
  - rdt1.0
  - rdt2.0
  - rdt2.1
  - rdt2.2
  - rdt3.0
- Rdt mechanisms.
  - Feedback: positive versus negative ACKs.
  - Checksum, retransmissions, sequence numbers, timers
- Performance of rdt3.0
- ARQ protocols:
  - Stop-and-wait.
  - Pipelining protocols (aka, sliding window protocols):
    - Go-back-N.
    - Selective Repeat.