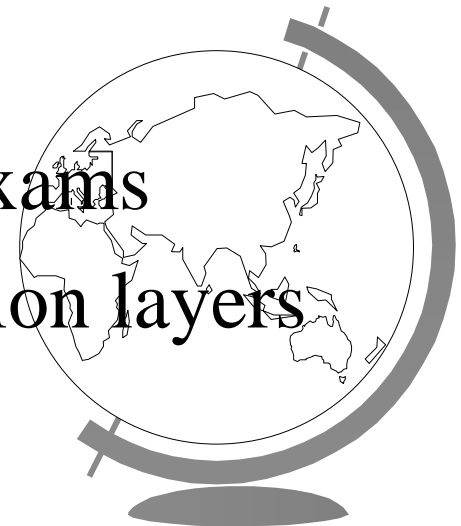# Intro to LAN/WAN

CS 513

CS 513 Final Review

- General:
  - Monday, May 3, 2010
  - In-class, 2 hours
  - No cheat sheets, formula sheets
- Material:
  - Non-cumulative
  - Tests only portions not tested in last exams
  - Roughly covers transport and application layers

Review: Transport Layer

☞ Services provided:
  – End-to-end, etc
  – Similarities to data link layer (ACKs, sliding window, sequence numbers, error control, etc), differences (end-to-end)
  – Similarities to network layer, differences

☞ Sockets API:
  – Why, function, etc

Review: Transport Layer

- Elements of transport layer
  - Addressing (ports, name server)
  - Connection establishment (3-way handshake)
  - Connection release (2-army problem)
  - Flow control and buffering
  - Multiplexing
  - Crash recovery

Review: TCP

☞ Segments

☞ Sliding window

☞ Service model:

  – Inetd daemon, end-to-end, full-duplex

☞ Protocol:

  – ACKs, piggybacking, connection establishment/release, receiver's buffer management, Nagle's algorithm, silly window problem

☞ Congestion control:

  – Network buffer, slow start, congestion avoidance, timer management, RTT

Review: UDP

☞ Features:
  – Minimal, multiplexing/demultiplexing

☞ Non-features:
  – Flow control, error control, retransmission

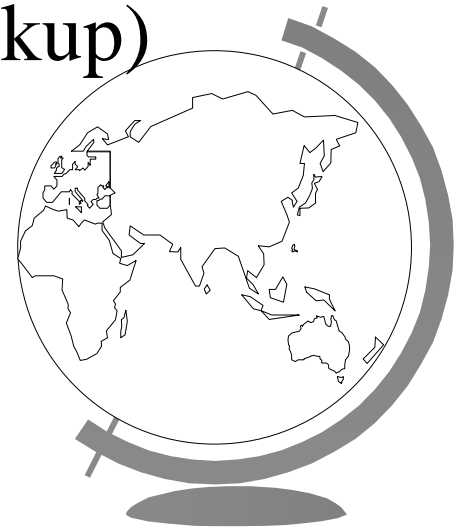☞ Typical applications:
  – Client-server, multimedia, etc

☞ Remote Procedure Call
  – Overview, main steps

Review: Application Layer (DNS)

☞ Human readable to ASCII

☞ Steps for lookup

☞ Domain name space (generic and country)

☞ Resource records

☞ Nameservers (zones, primary-secondary servers)

☞ Address resolution process (recursive lookup)
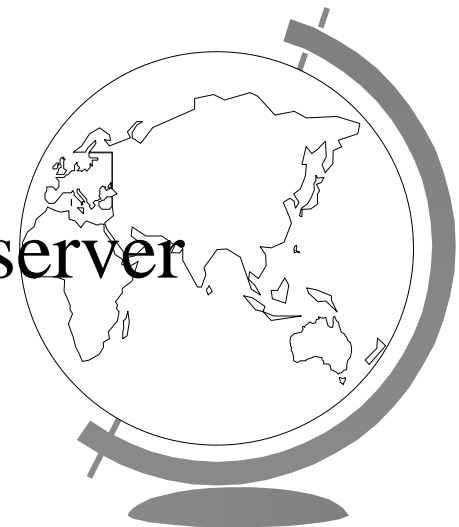
Review: Application Layer (Email)

☞ User agent (RFC 822)

☞ Transmission Protocol (SMTP)

☞ How Email works!!

☞ MIME

   – why necessary, etc

☞ Disconnected Users

   – Pop3, IMAP, webmail

Review: Application Layer (WWW)

☞ Architecture:
- Client side
  - ◆ how to get web page, plug-ins, helper applications
- Server side
  - ◆ Just know steps, what it does
- URL, web pages (static, dynamic, etc)
- HTTP
- Performance enhancements (caching, server replication, CDNs)
- Wireless web (Imode, WAP)

Review:Application Layer

☞ Multimedia: Audio

– Audio compression: MP3, etc

– Streaming Audio

– Voice over IP (H.323, SIP)

☞ Multimedia: Video

– MPEG