CS 725/825
Computer Networks
IT 725
Network Technology

Fall 2015
Coursework & Evaluation

- Five homework assignments: 40%
  - Assuming no major schedule disruption, assignments will be due on Wednesdays: September 16 and 30, October 21, November 18, and December 9, 2015

- Two in-class exams: 30%
  - Monday October 12 and November 9, 2015

- Final exam: 30%
  - Friday, December 18, 2015, 8-10 am

- Extra credit will be given at my discretion for work significantly above and beyond what was asked and for continued participation on Piazza.
Course Outline

Networking Fundamentals

Basic Concepts

Application Protocol Design and Implementation

Network Security

Principles of Reliable Transport - Transport Layer

Routing and the Network Layer

Link and Physical Layers

Yes, we will visit some subjects multiple times!
Teaching Method

- Lectures (conceptual and practical subjects)
- Guided exploration and reading
- Paper and pencil problems
- Programming exercises
  - protocol implementation
  - protocol design
- Hands on experimentation with networks
- Network performance evaluation
What is the question?

- "Faster" networks
  - Higher transmission rate
  - Lower latency
- Lower error rate (bit error rate, packet loss probability)
- Higher availability (reliability)
- Ubiquity
- Lower monetary cost
- Improved user experience (lower complexity)
Basic Concepts
Categories of Networks

- Wide Area Network (WAN)
- Local Area Network (LAN)
- Access Network
- Cellular Data Networks
- Datacenter Networks
- Storage Networks (SAN & NAS)
- Personal Area Network (PAN)

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Basic Terms

- **Protocol**
  - An agreement on how a communication is to proceed

- **Packet** (frame, message, datagram, cell, ....)
  - header, data (payload), trailer

- **?-cast**
  - unicast, multicast, broadcast, anycast, ...

- **Single hop vs. multihop**