Lecture 1: August 24, 2017

1. What does he mean by the Internet?
   The core networking infrastructure that links al connected computing devices - not talking about applications built on top

2. What does the Internet do?
   Delivers data between end points - done by chopping into packets and reconstructing

3. What is this course about?
   Internet isn't just another network - it ties different networks together - "Inter"
   Internet goal is to connect many different networks across the world with the ability to tolerate failures
   Architecture: allocation of functionality and definition of interfaces among elements
   Engineering: how the tasks get done

4. What Does the Internet Look Like?
   End Systems: send and receive packets
   Switches/routers: forward packets = routing decisions ensure packets reach destination
   Links: connect end systems to switches and switches to each other
   Internet Service Providers (ISPs) run their own networks (University, Verizon, Non-profit, etc.)
   IPC: set of mechanisms that all processes on same host to exchange data - Internet goal is to do this on two different hosts.

5. Why study the Internet?

   - The Internet is changing everything OMG
   - Complex design - the Internet had to solve a system where competitors cooperate
   - Massive scale: lots of users, machines, links, etc.
   - Diversity and dynamic range - when designing must be prepared for different latency levels, amount of packet loss, technology, endpoint devices, applications, users
   - **Asynchronous Operation**: fundamental constraint of the speed of light
   - Prone to failure: many components leads to bad end to end reliability
   - New design paradigm: went against phone network designers. Designers of Internet knew **dealing with failure is the key to scaling systems**

- Networking undergoing revolution: previously had been closed, stagnant, and feudal. There were slow moving standards dominated by Cisco. Recently, commodity hardware making inroads, rise of x86 forwarding, open source software starting to appear, better understanding of how to make networking look more like other systems

6. Why are networking courses so bad?

   - Static Architecture: 40 years old, can't test new architectures in lab or testbed, so we will learn history not principal
   - No intellectual Framework: Internet inventors had a brilliant paradigm but research community has failed to provide a general framework for understanding protocols

7. What is the course workload, grading, etc?
   3 projects, 6 practice problem sets, a midterm and a final

8. Who am I and how do I teach?
   He's a vindictive son of a bitch

9. What do I expect from you?
   Come to lecture

10. Is CS168 the right class for you?
    Yes