B345 Internet Science and Technology

Week 2 lecture 1

Prelude

- change to submission date of assignment
- supplements to iLectures
- diagrams
- the 3 papers related to this week's lectures

This lecture's Learning Objectives

- Have a basic idea what "Network Architecture" refers to when it comes to the Internet.

- Understand some of the basic principles underlying the Internet Architecture.

"Network Architecture"

- Not precisely defined.

- Some examples of usage:

  1) based on physical topology
  2) based on a single protocol
  3) based on protocol stacks
  4) based on a set of design principles

- IETF and IAB uses (4).

"Network Architecture"

- Different things to different people.

- Who are the people:
  - IS Managers
  - Corporate network support
  - Network operators and ISPs
  - hw/sw vendors
  - academics and researchers at different levels

Architecture Goals

- The 7 requirements (or goals) that the current Internet Architecture is built on:
    - internetworking
    - robustness
    - heterogeneity
    - distributed management
    - cost effective
    - ease of attachment
    - accountability

What does architecture define

- Some examples matters an architecture can determine:
    - how to maintain state
    - component names
    - addressing
    - responsibilities of layers
    - resource handling
    - security boundaries
    - management boundaries
    - QoS
    - etc.

Principles to Implementation

Architecture Principles

- Reference model
  - protocol stack
    - protocol implementation

Why Architecture?

- Cross developer consistency
- Long term consistency

Why Reference Models?

- reduce complexity by modular design
- clarity for protocol designers on where to place responsibilities

Why Protocols?

- Software must have agreements on how, what and when to communicate

Architecture and Implementation

- Where to place the specifications?

Do people really follow architectures?

- An example or two …

Next Lecture…

- The Internet Architecture and the TCP/IP protocol suite.
    - What is it?
    - How it works?
    - Does it follow it's own principles?
    - Current challenges and future possibilities.