

Week 1 Lecture Notes

INFO 341 / Spring 2017

Purpose

What value do networks provide to us?

1. Communication networks enable us to share information and resources
2. Control networks are used to monitor or control parts of a system

What are some examples?

- Communication / Collaboration / Entertainment
 - Internet
 - Voice
 - Television
- Control networks
 - Vehicle control bus
 - Industrial sensor network
 - System bus for computer

What are the fundamental principles and components that are employed to build modern networks?

First and foremost, we should remember that networks are shaped by the applications that they support. This is true even of the general-purpose networks that we'll spend time with in this course. But it's also important to note the many ways that networks shape our lives.

Arpanet, the network that eventually became known as the internet supported three application protocols:

- Telnet
- FTP (email was a special case)
- RJE

Two of these protocols (Telnet and FTP) are still in use today, much to the dismay of security professionals.

Building blocks of the network

We'll dive more deeply into these concepts throughout the quarter. For now, try to get a broad understanding of the roles these devices play in a network. As we progress, our main focus will be on endpoints and routers

- Transmission medium / signaling
- Standard network components / functions
 - Endpoints (also called nodes or hosts)
 - Network Interface Controllers/Cards (NIC)
 - Modems
 - Firewalls
 - Routers
 - Bridges and switches
 - Hubs and repeaters
 - (Wireless) access points
- Protocols and logical concepts
 - Identifiers and addresses
 - Applications and services
- Network interconnection

Governance

Organizations and standards to govern shared network resources

- ICANN
 - IANA
 - RIR
 - ARIN
 - RIPE
 - etc
- IEEE
 - 802.11
 - 802.3
 - 802.1x
- IETF
 - IESG
 - Request for Comments
- OSI
- ITU / ITU-T
 - E.g., X.509
- ANSI

Others

- ISO/IEC
- EIA

- W3C
- Governing bodies
 - FCC
- Browser manufacturers