

Recitation 10: DARPA Network

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Plan

- Survey results
- Recitation Qs
- Packets in Action
- Routers in Action

Logistics

- * Thank you re: survey!
- * Hands on due today at 11:59 pm
- * DP Prelim Report due 3/18.
- * Volunteers?

Survey Summary

- Pace - OK
- Technical - Not enough
- Most favorite: Demos, big group discussion
- Least favorite: Debates, small group discussion
- Suggestions:
 - * let people pick their groups sometimes
 - * Asking people to call things out
 - * All-class questions
 - * notes after
 - * Telling stories from your life that are tangentially related to material...

Recitation notes henrycg.com/teaching

What did you think of this paper?

Recitation Qs

1. What were three key goals?

- connect nets (internet)
- func despite loss
- many service types
- distrib mgmt

2. How did design meet those goals?

- packet switching
- datagrams → simple network

3. If you could go back in time & redesign, what goals would you prioritize?

Two key ideas:

1. Packets ("datagrams")

- Simplifies nodes in network - no state
- Flexible - much more flexible than fixed-rate stream
- Least common denominator → many net types

[Alternative: Connection-oriented network]

2. Gateways ("routers")

- Connect different networks together ASes
- Many networks (Inter-net)
- Power comes from fact that packets can flow over any type of link.

Packets in action : Wireshark

Things to notice

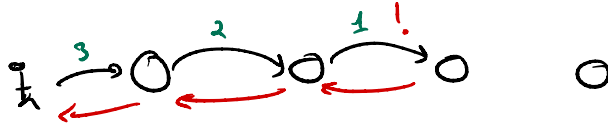
- encapsulation Ethernet → IP → TCP → app data
- ACKs & window as in lecture
- Out-of-order data
- Many protocols at once
- Show HTTP GET (no encryption)

Routers in action: Traceroute

↳ You saw this in hands-on

- Explain how it works

↳ Why does TTL exist?



- Show in Wireshark

→ Show mtr & traceroute.

→ Examples:

* market.scs.stanford.edu

* www.ethz.ch

* www.univ-antonarivo.mg

In groups

1. Longest link? (Hops or latency)

2. Link with most loss?

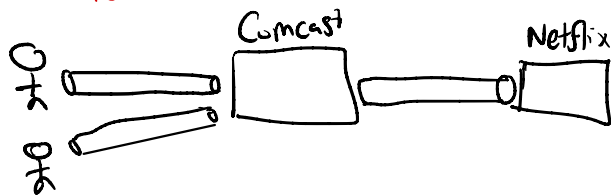
What did we get wrong^(?) with the Internet?

- Security - responsibility of end hosts

↳ But no sec for routing, other protocols that keep net running

- Billing - e.g. Netflix

↳ Magic! It costs the same to send a packet to NY as to Madagascar!
Unlike phone.



- Management

↳ Very distributed - no central view/plan

What would we do differently?