CS 134
Intro to Computer Science

Mar 16, 2016
Lecture 17:
Switched Networks

Announcements
- Submit Lab 6
- Midterm review sessions:
  - Wed 1:00-2:00 TPL 203
  - Wed 8:00 TPL 203
- Midterm
  - Thur 6 p.m. or 7:30 p.m. in TPL 203
  - 75 minute closed book exam
- Homework solutions are now available online (on campus)
- No class on Friday

Today’s Plan
- Wrap up HTTP
  - 1.0 vs. 1.1
  - Discuss circuit-switched versus store-and-forward networking
  - Midterm review?

HTTP
HTTP
CLIENT
SERVER
HTTP/1.0

- Connect to server on port 80
- Send: GET /name-of-document HTTP/1.0
- Send any optional header lines
- Send: a blank line
- Process server’s response
- Server closes connection
HTTP/1.1

- Connect to server on port 80
- Send: GET /name-of-document HTTP/1.1
- Send: host: name of server
- Send any optional header lines
- Send: a blank line
- Process server's response
- Server maintains connection (briefly)

From The History of the Telephone by Herbert N. Casson. Published: 1910

By 1884, . . . , there came to be a group of mechanics and high-school graduates, very young men, mostly, who had no reputations to lose; and who, partly for a living and mainly for a lark, plunged into the difficulties of this new business . . . . The problem that they dashed at so light-heartedly was much larger than any of them imagined.

All that these young men had received from Bell and Watson was that part of the telephone that we call the receiver. This was practically the sum total of Bell's invention, . . . . There were no switchboards of any account, no cables of any value, no wires that were in any sense adequate, no theory of tests or signals, no exchanges, no telephone system of any sort whatever.

As for Bell's first telephone lines, they were as simple as clothes-lines. Each short little wire stood by itself, with one instrument at each end. . . . But there had now come a time when more than two persons wanted to be in the same conversational group. . . . Here was the new problem, and a most stupendous one -- how to link together three telephones, or three hundred, or three thousand, or three million, so that any two of them could be joined at a moment's notice.
Distance from WMS to ALB = \frac{M}{R}

Distance from WMS to RPI = \frac{D_3}{c}

Distance from RPI to B = \frac{D_4}{c}

Distance from T to WMS = \frac{D_1}{c}

Distance from ALB to RPI = \frac{D_2}{c}

\{ D_1, D_2, D_3, D_4 \} = \{ D_1/c, D_2/c, D_3/c, D_4/c \}

Distance = M/R

Circuit Switching
Message/Packet Switching = Store and Forward Networking
**Circuit Switching**

- ALB
- WMS
- T
- B
- T
- i
- m
- e
- Distance

\[ D_1 = \frac{D_1}{c} \]
\[ D_2 = \frac{D_2}{c} \]
\[ D_3 = \frac{D_3}{c} \]
\[ M/R \]

**Message/Packet Switching = Store and Forward Networking**

- ALB
- WMS
- RPI
- T
- i
- m
- e
- Distance

\[ D_1 = \frac{D_1}{c} \]
\[ M/R \]
\[ D_2 = \frac{D_2}{c} \]
\[ M/R \]
\[ D_3 = \frac{D_3}{c} \]
\[ M/R \]
\[ D_4 = \frac{D_4}{c} \]
\[ M/R \]
\[ P/R \]

\[ D_1 = \frac{D_1}{c} \]
\[ M/R \]
\[ D_2 = \frac{D_2}{c} \]
\[ P/R \]
\[ D_3 = \frac{D_3}{c} \]
\[ P/R \]
\[ D_4 = \frac{D_4}{c} \]
\[ P/R \]
Message/Packet Switching = Store and Forward Networking

\[
\text{Time} \quad \text{Distance} \quad \begin{cases} 
\{ = D_1/c \\
= M/R \\
\{ = D_2/c \\
\{ = D_3/c 
\end{cases}
\]