Lecture 10:
Wide area networks

CSE 222A: Computer Communication Networks
George Porter
Lecture 10 Overview

- Overview of risk in wide area networks
- InterTubes paper discussion
3:08pm, eastbound CSX freight train derailed while in the Howard street tunnel

4 tank cars in the tunnel catch fire
- One contained tripropylene
- Two contained hydrochloric acid
- One contained di(2-ethylhexyl) phthalate

Resulting fire burned for four days
- Tunnel walls to 1500+ degrees

Water main above broke due to fire, leaking 12M gallons of water
http://www.ntsb.gov/investigations/AccidentReports/Reports/RAB0408.pdf
Attacking an underground fire

- Water main break above the tunnel floods streets and nearby businesses.
- Truck pumps hydrochloric acid out of train car 53.
- An air hose is used to pressurize car 53.
- Fire hose is also sent down manhole to battle fire.

Approx. 16 ft deep

Approx. 37 ft deep

Car 53 contains hydrochloric acid

Most of the other chemicals on the train were common ingredients used in manufacturing.

SOURCE: LAI Construction
rafael anderson, sheridell medonald, jerald councal: sun staff

Drawings not to scale
“Keynote Systems (news/quote), which measures the performance of Web sites, said slowdowns in Atlanta, Seattle, Los Angeles and elsewhere were probably related to the burned cables. The company said the Internet delays were the worst it had seen.”

“Telecommunications companies including WorldCom (news/quote), PSINet (news/quote) and AboveNet all reported problems.”

The Internet Health Report (Last Hour)


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Healthy < 80ms Latency.
Severe < 180ms Latency.
The colored square indicates the largest geometric mean within the area specified, over the time period.
Web site performance (stock purchase)
Web site performance (NYTimes.com and WSJ.com)
For Next Class…

- Read and review Pathlet routing paper
- Take-home assignment going out today
- Keep moving on term projects!