

## **Did we miss the fork in the road?**

---

**Scott Bradner**  
Harvard University

**Information Superhighway Summit**  
September 27 1994

## **Today as myth**

---

- ◆ Internet is a free good
- ◆ small
- ◆ run by grad students
- ◆ mostly U.S.
- ◆ no security
- ◆ no service guarantees
- ◆ dumb inefficient protocols
- ◆ driven by hunt for dirty pictures

## **Today as reality**

---

- ◆ U.S. government pays < 20%
  - U.S. inter-organizational
- ◆ 3-4 million computers
  - 4-30 million users (direct)
- ◆ run by commercial service providers
- ◆ growing faster outside of U.S. than inside

## **Today as reality, contd.**

---

- ◆ no security
- ◆ no service guarantees
- ◆ dumb inefficient protocols
- ◆ driven by hunt for dirty pictures

## What is a superhighway?

---

- ◆ video on demand?
- ◆ stock quotes?
- ◆ news wire?
- ◆ 5 million servers and still nothing there?
- ◆ home shopping with virtual reality?

## What would people buy?

---

- ◆ hard to project demand for a new paradigm
- ◆ remember Xerox expectations
- ◆ and supercomputer expectations
- ◆ is the hacker (old meaning) market full?
- ◆ projecting with today's eyes
- ◆ what size/cost will the tool be?

## Why ask what?

---

- ◆ before you can know if you have a precursor
  - need to know the shape of the final beast
- ◆ before you can know the shape of the final beast
  - need to know services that will be offered
- ◆ before you can know services
  - need to think elsewhere
- ◆ "any significantly advanced science is
  - indistinguishable from magic"

## Now that we know that we can't know

---

- ◆ if you can't know where you are going
  - how do you pick the road?
- ◆ look for hints
- ◆ (not necessarily road less traveled)

## Hints

---

- ◆ what got us here?
  - teach the students (they will teach the teachers)
- ◆ what's hot now?
  - Mosaic
  - video games (different venue)
  - home shopping
- ◆ who is doing it to us?
  - ABT (anybody but telcos)

## Hints, contd.

---

- ◆ what's it like?
  - telco?
    - » few applications (voice)
    - » few standards
    - » distributed session initiation
    - » simple network (star architecture )
    - » defined regions (local & long distance)
    - » few servers

## Hints, contd.

---

- ◆ what's it like? contd.
  - cable TV?
    - » few applications
    - » few standards
    - » mostly one way
    - » simple network (star architecture)
    - » defined regions
    - » few servers

## Hints, contd.

---

- ◆ what's it like? contd.
  - highway system
    - » many applications
    - » many standards
    - » let me count the ways
    - » many servers
    - » complex network (mesh network)

## Conclusions

---

- ◆ Interstate Commerce Commission!
  - (that's where logic will get you)

## Let's try again

---

- ◆ telco knows point to point
  - data network is a mesh
- ◆ cable TV knows broadcast
  - data network is interactive
- ◆ telco & cable TV - few servers, few standards
  - data network - many servers, many standards

## What's left?

---

- ◆ the Internet

## What's left to do?

---

- ◆ security
- ◆ commerce enablers
  - clearing houses
  - authentication (key) servers
  - resource reservation
  - EDIish transfers

## What's not left to do?

---

- ◆ standards by fiat
  - remember OSI & ISDN?
- ◆ universal service guarantees
- ◆ regulated service

## the Internet

---

- ◆ will have many players
  - (including telcos)
- ◆ is growing into the superhighway
  - (the useful one anyway)
- ◆ is building the future
  - (not waiting for manna from utility heaven)
- ◆ i.e. the Internet is the future
  - (as best as can be seen from way back here)