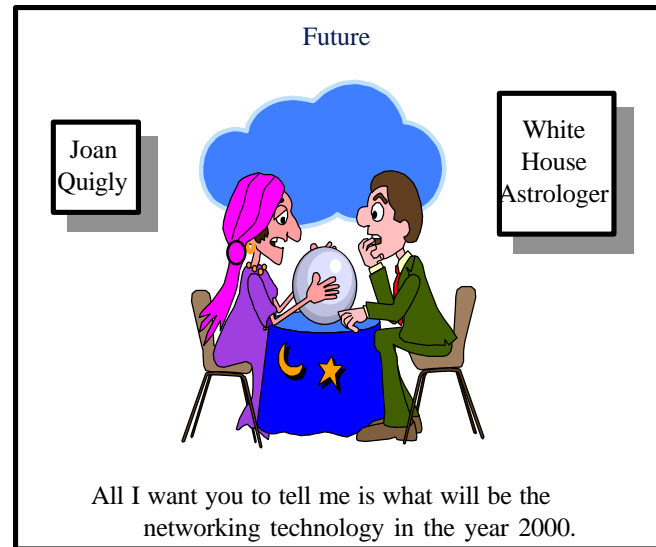


# Networking Trends



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- ❑ Networking Trends
- ❑ Life Cycle of Technologies

# Trend: Networking is Critical

- ❑ Communication more critical than computing
  - ⇒ Bus performance vs ALU speed
  - ⇒ I/O performance vs SPECMarks
- ❑ User Location:
  - ❑ 1960: Computer room      1970: Terminal room
  - ❑ 1980: Desktop              1990: Mobile
- ❑ System Extent:
  - ❑ 1980: 1 Node within 10 m
  - ❑ 1990: 100 nodes within 10 km

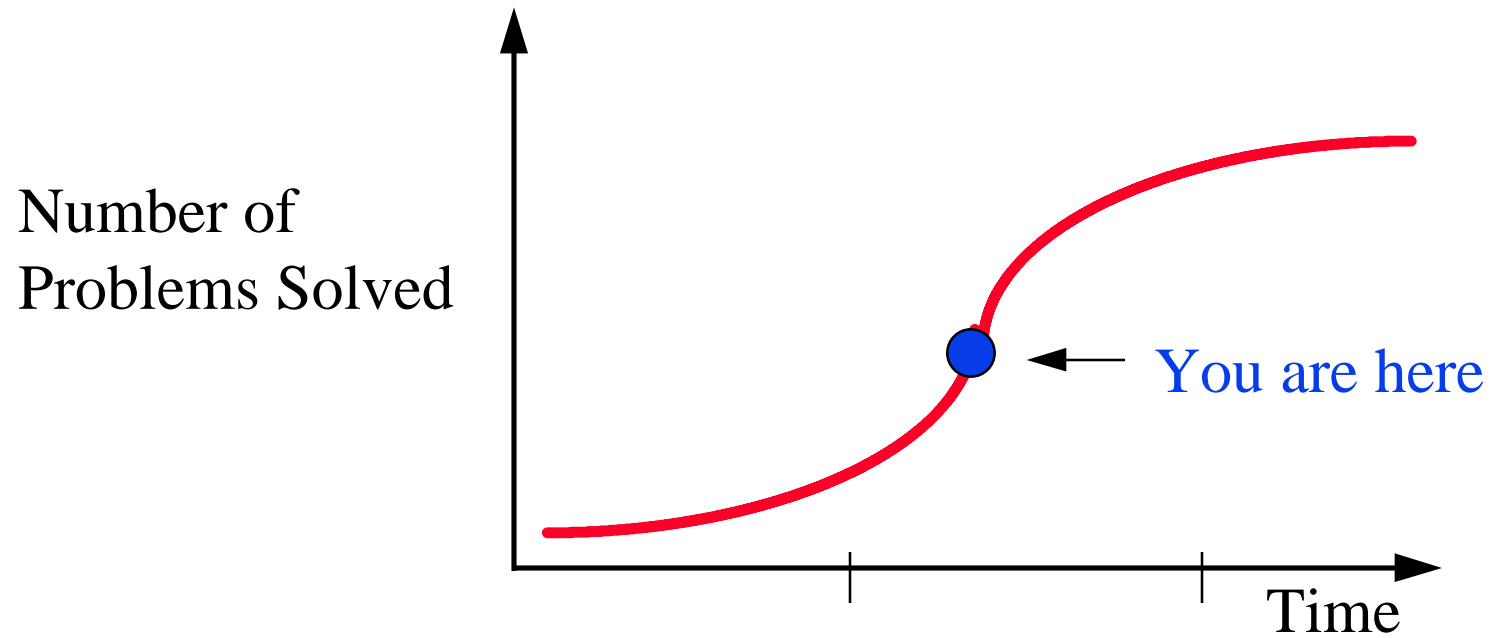
- ❑ Last 10 years: Individual computing  
Next 10 years: Cooperative computing
- ❑ Past: Corporate networks  
Future:
  - ❑ Intercorporate networks
  - ❑ National Info Infrastructures
  - ❑ Global Info Infrastructures

# Trend: Telecommunication and Networking

- From computerization of telephone traffic switching to telephonization of computer traffic switching.

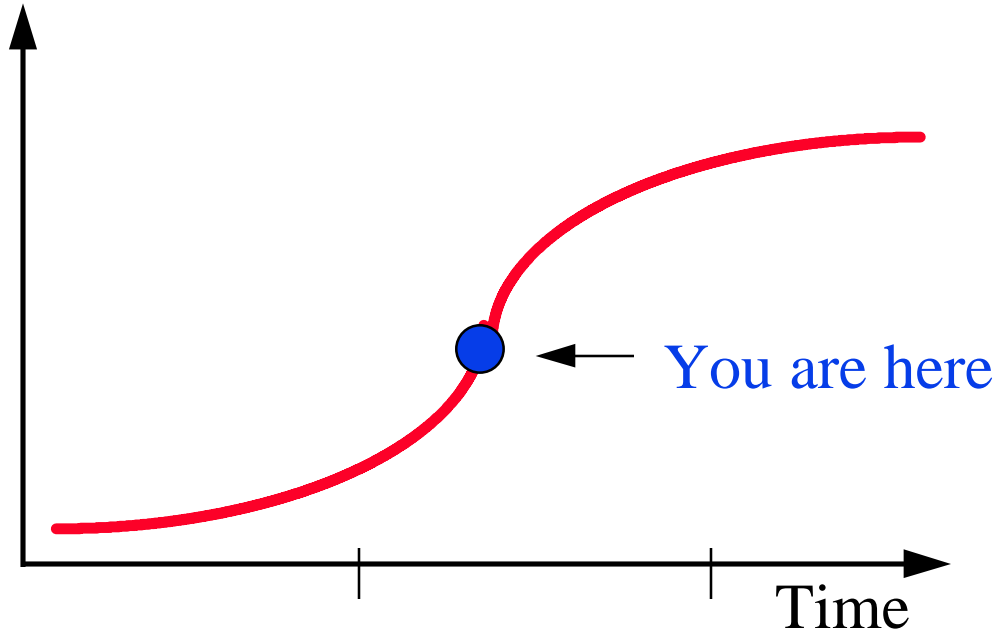


# Life Cycles of Technologies

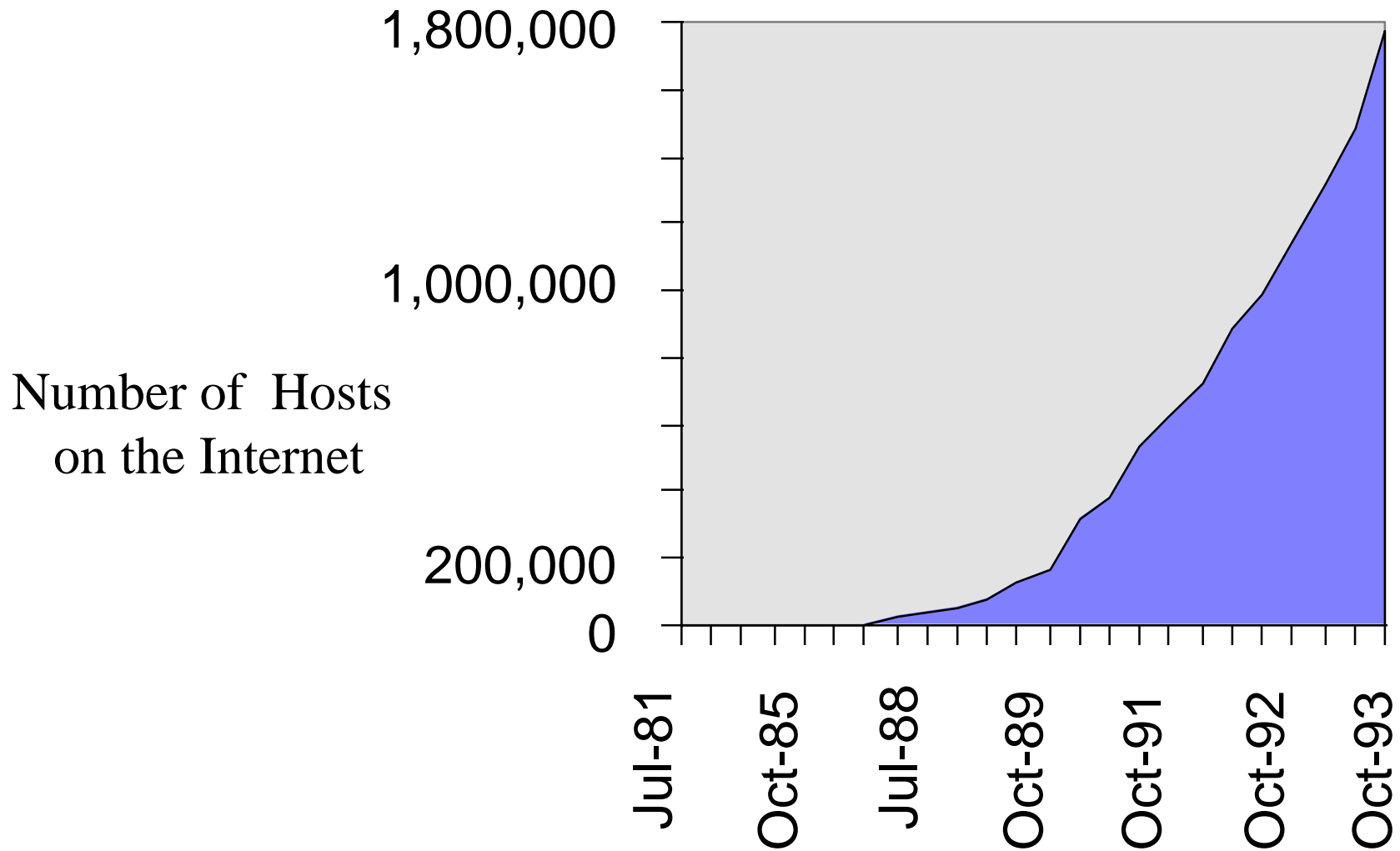


# Life Cycles of Networking Technology

Number of Hosts  
Bytes per Hosts  
Number of Networks  
MIPS  
Memory Size  
Storage



# Trend: Exponential Growth



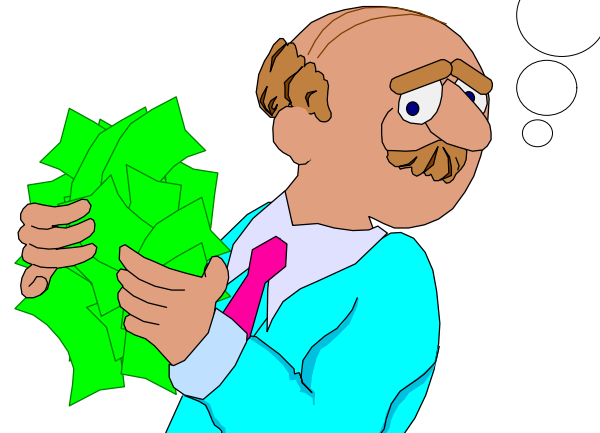
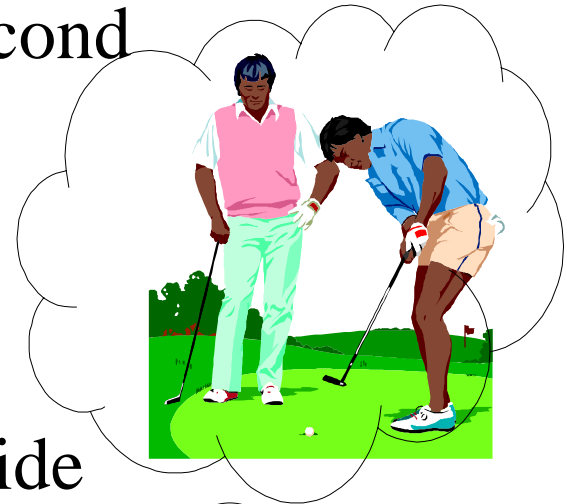


# Networking in Social Fabric

- ❑ USENET: Ten million news articles/month
- ❑ 18 on-line coffee houses in San Francisco
- ❑ National Public Radio Program
- ❑ Supreme court decision within one day
- ❑ Real estate, on-line catalog
- ❑ 137 countries reachable via Email

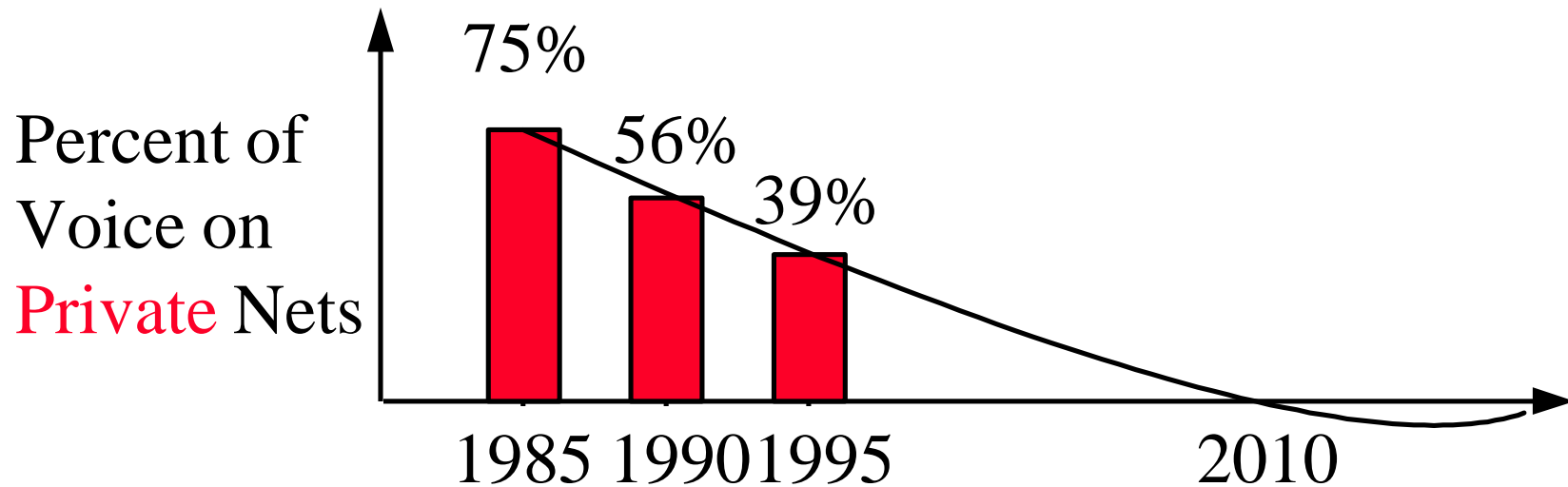
# Trend: Profusion of Information

- ❑ High Technology  $\Rightarrow$  Less labor  $\neq$  More vacation
- ❑ High bandwidth  $\Rightarrow$  More bits per second
- ❑ Hundreds of telegrams per day
- ❑ Short product development cycles
- ❑ Short technology cycles
- ❑ Research and development side by side



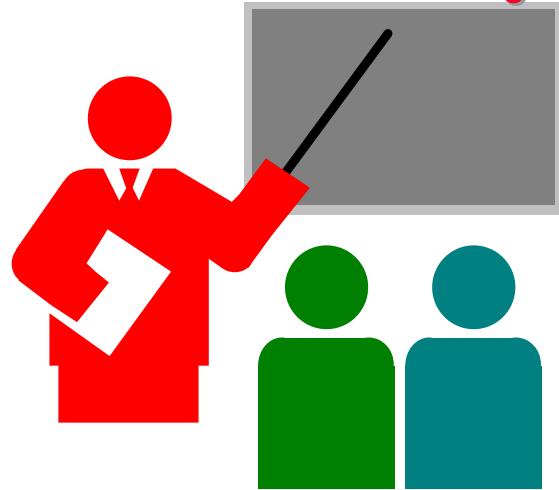
# Trends in Applications

- Little Voice
- AT&T: 125 to 130 M calls/day @ 5 min/call  
64 kbps/call  $\Rightarrow$  28.8 Gbps = 1/1000 of one fiber
- 200 Million X 24 hr/day X 64 kbps = 12.8 Tbps



◆ Ref: IEEE Spectrum, August 1992, p 19.

# Summary



- ❑ Networking is critical and growing exponentially.
- ❑ Computer and Telecommunications industry merging
- ❑ Networking is becoming an essential part of social fabric