

# Computer Networks

## History of the Internet (§1.5.1)

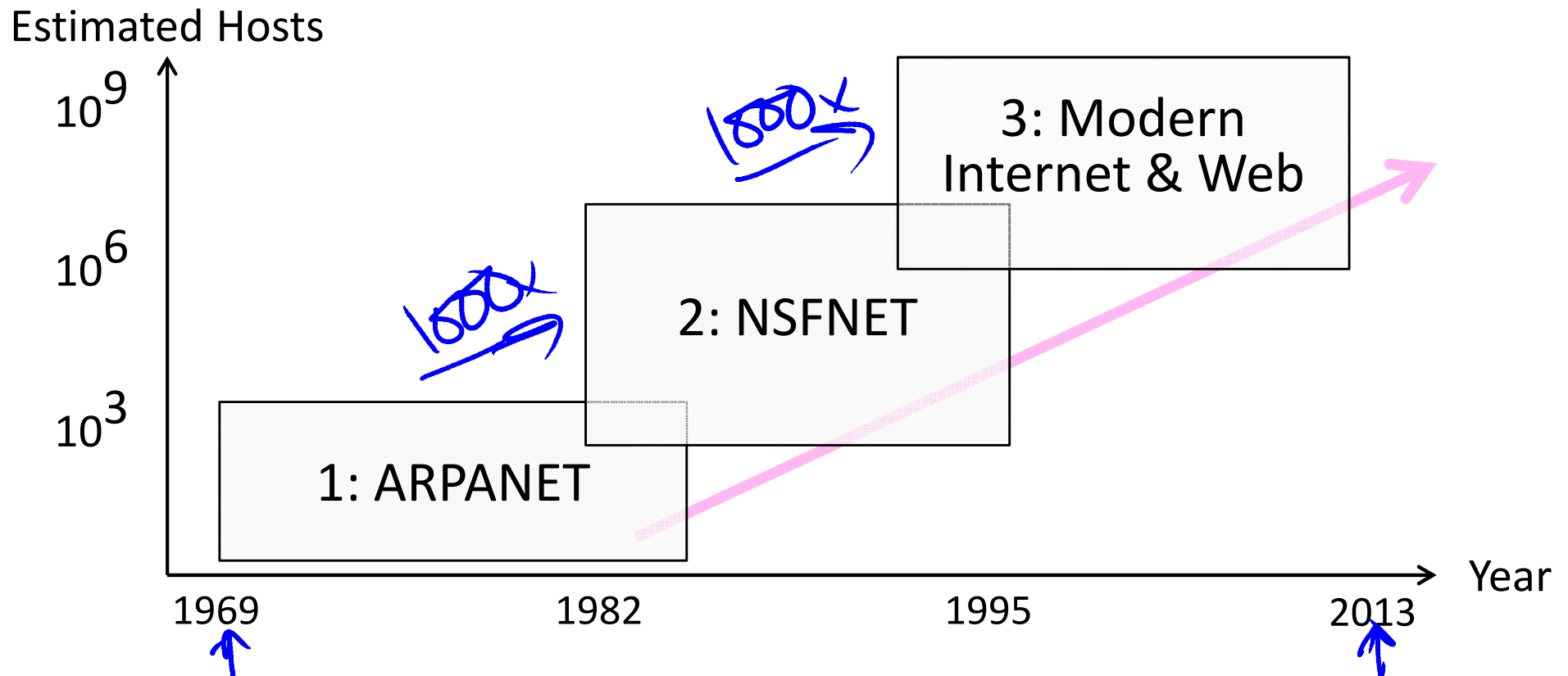


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# Rough Internet Timeline



# The Beginning – ARPANET

- ARPANET by U.S. DoD was the precursor to the Internet
  - ➔ Motivated for resource sharing
  - ➔ Launched with 4 nodes in 1969, grew to hundreds of hosts
  - ➔ First “killer app” was email

# ARPANET – Influences

- Leading up to the ARPANET (1960s):
  - Packet switching (Kleinrock, Davies), decentralized control (Baran)

Paul Baran



Credit: Internet Hall of Fame

Donald Davies



Credit: Internet Hall of Fame

Len Kleinrock

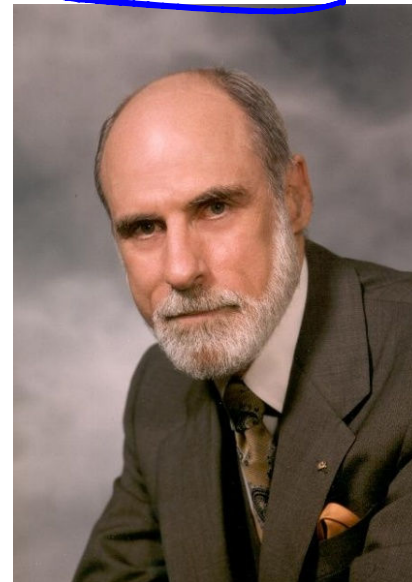


Credit: Internet Hall of Fame

# ARPANET – Influences (2)

- In the early ARPANET
  - Internetworking became the basis for the Internet
    - Pioneered by Cerf & Kahn in 1974, later became TCP/IP
  - ↪ They are popularly known as the “fathers of the Internet”

Vint Cerf



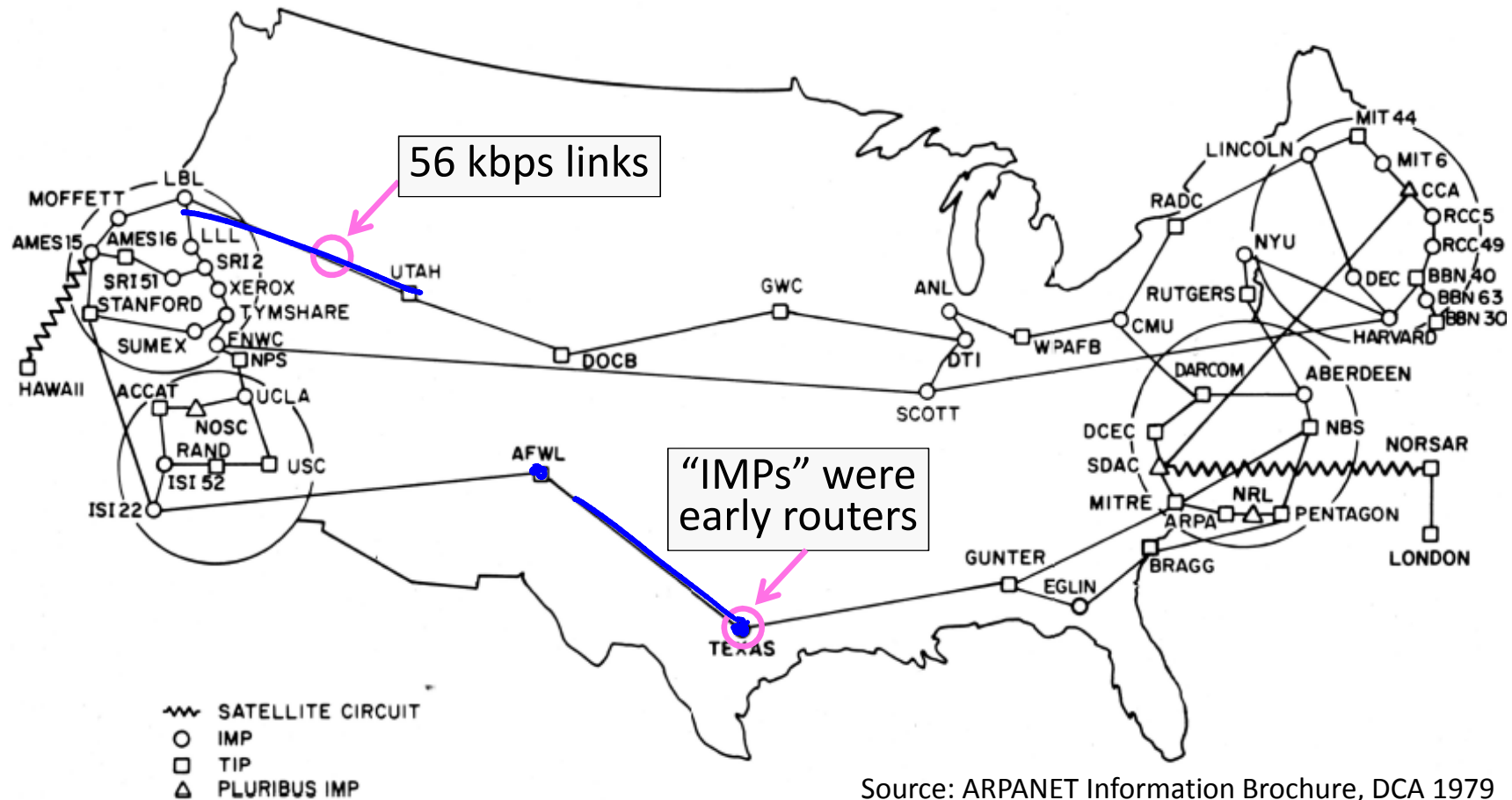
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Bob Kahn



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# ARPANET Geographical Map (Dec. 1978)



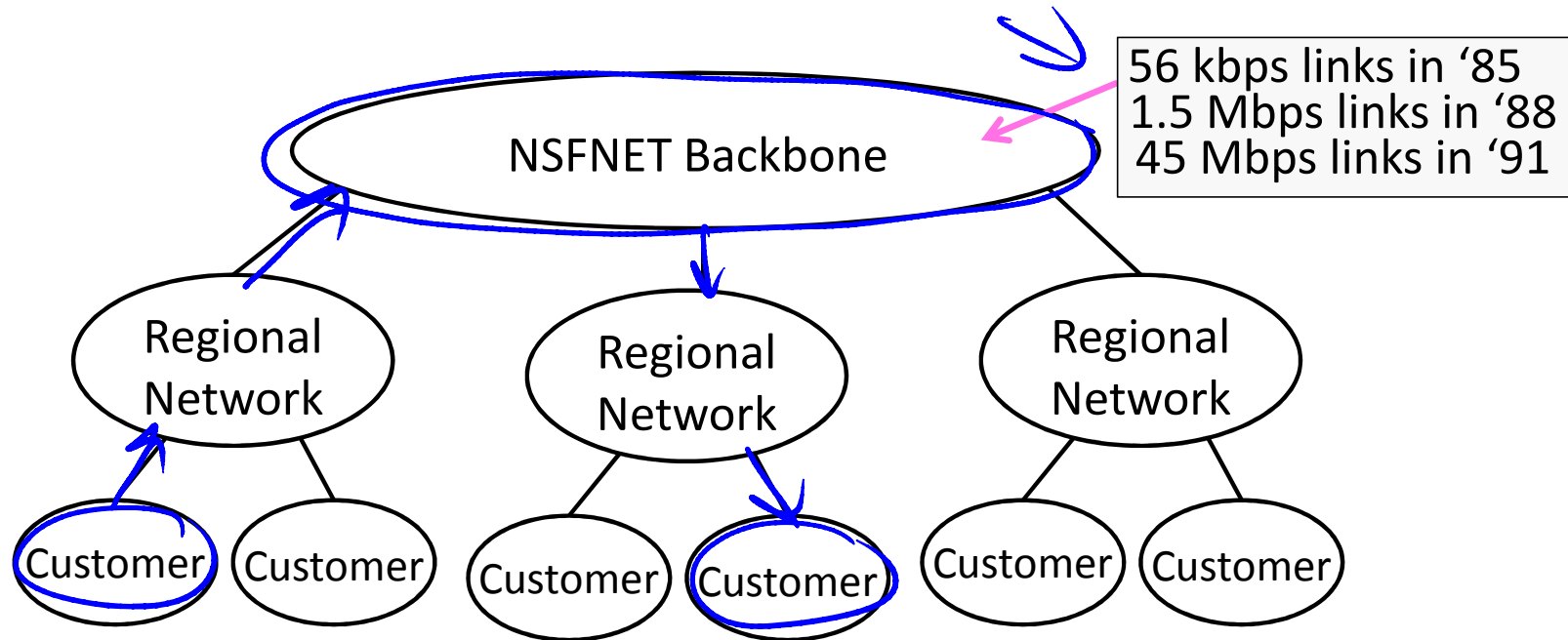
Source: ARPANET Information Brochure, DCA 1979

# Growing Up – NSFNET

- NSFNET '85 supports educational networks
  - Initially connected supercomputer sites, but soon became the backbone for all networks
- Classic Internet protocols we use emerged
  - TCP/IP (transport), DNS (naming), Berkeley sockets (API) in '83, BGP (routing) in '93
- Much growth from PCs and Ethernet LANs
  - Campuses, businesses, then homes
  - 1 million hosts by 1993 ...

# Early Internet Architecture

- Hierarchical, with NSFNET as the backbone

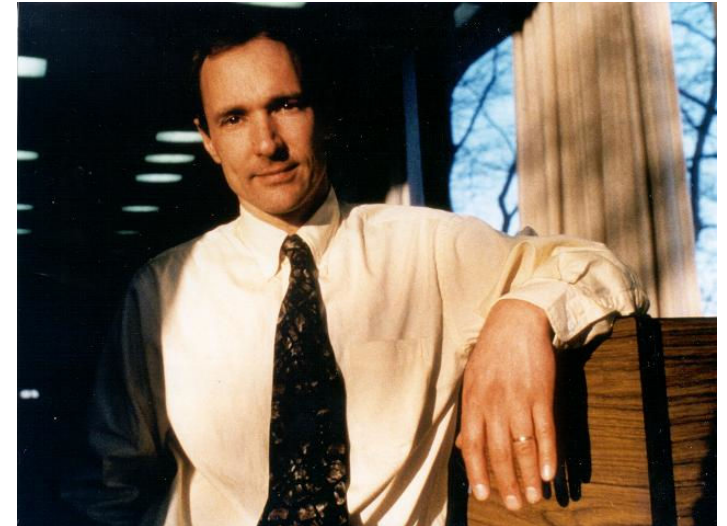




# Modern Internet – Birth of the Web

- After '95, connectivity is provided by large ISPs who are competitors
  - They connect at Internet eXchange Point (IXP) facilities
  - Later, large content providers connect
- Web bursts on the scene in '93
  - Growth leads to CDNs, ICANN in '98
  - Most bits are video (soon wireless)
  - Content is driving the Internet

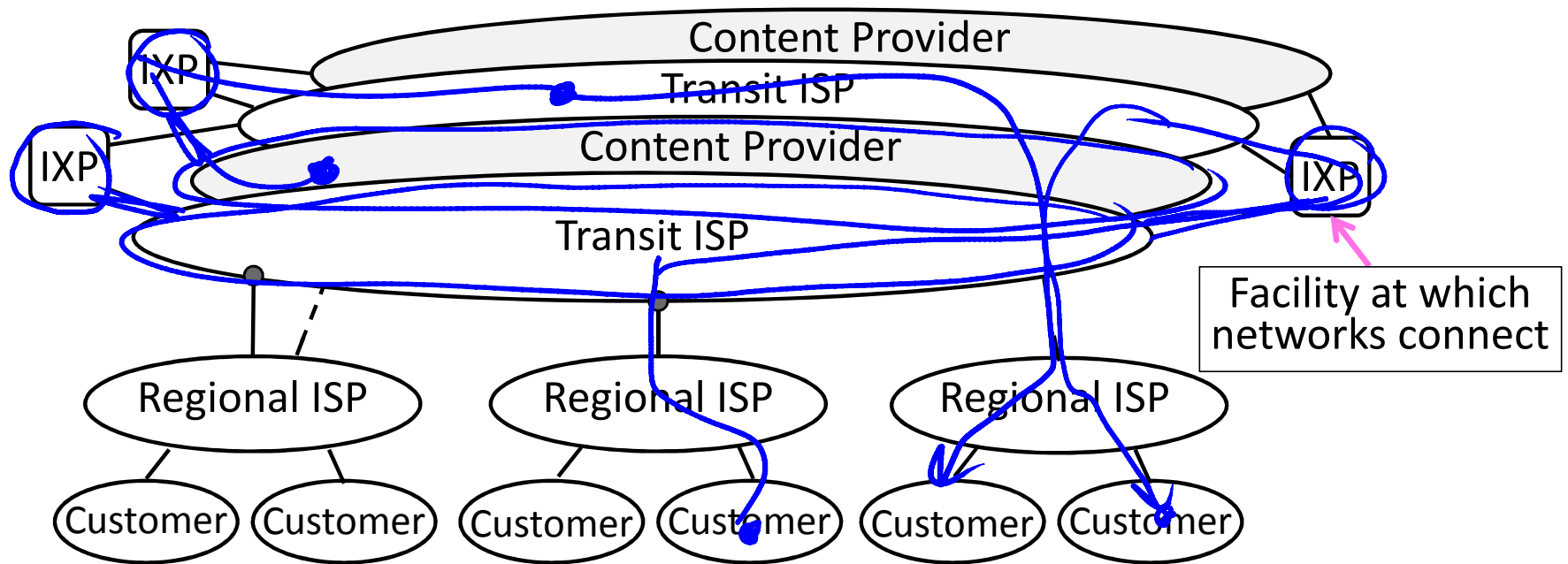
Tim Berners-Lee



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# Modern Internet Architecture

- Complex business arrangements affect connectivity
  - Still decentralized, other than registering identifiers



# END

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