History of Telecommunication

Kameswari Chebrolu

"If you don't know where you've come from,
you don't know where you are."
                        --- James Burke

"Life must be lived forward, but it can only be
understood backward."
                        --- Søren Kierkegaard

Prehistoric

- Smoke signals/Fire (Visual)

- Drums (Sound)
  - Message can be conveyed 100 miles in an hour (through relays)

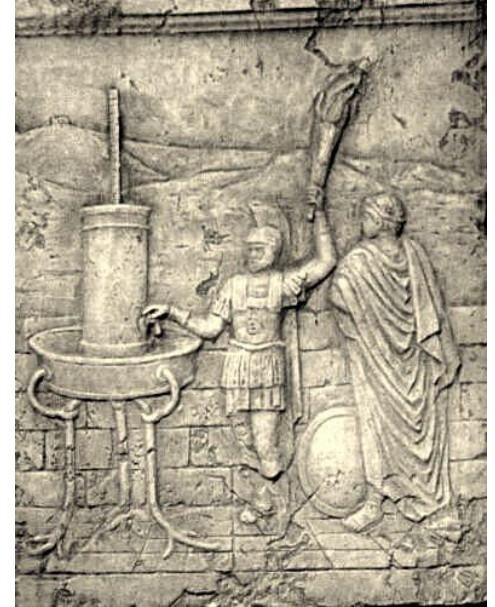Talking Drum

Before Common Era (BCE)

- Mail

Figure from stock.xchng
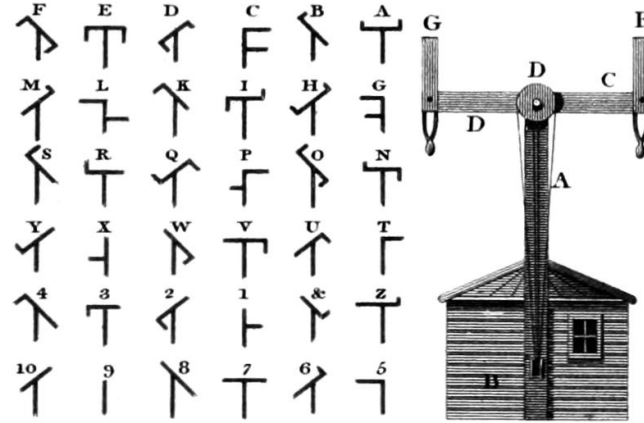
- Pigeons

- Hydraulic Semaphore

Hydraulic semaphore

1700's to Before Internet

- 1790's: Semaphore Lines (Optical telegraph)

- 1800's: Heliograph (Solar telegraph)

- 1830's: Electric telegraph

- 1870's: Telephone

Semaphore Lines

Heliograph

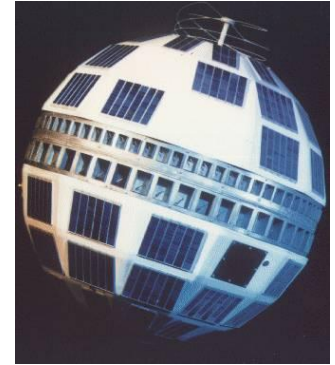Telegraph

1700's to Before Internet

- 1890's: Radio

- 1920's: Television

- 1960's: Satellite

Marconi operating apparatus similar to that used by him to transmit first wireless signal across Atlantic

RCA 630-TS, the first mass produced television set, which sold in 1946–1947

July 10, 1962, Telstar, first telecommunications satellite, is put into orbit.
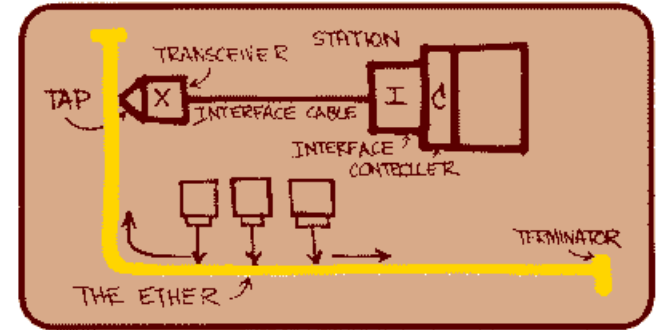
Computer Networks: The beginning

- 1960's:
  - Fiber Optics
  - Packet switching by Kleinrock
- 1969: Four nodes (UCLA, Stanford, UCSB and Univ. of Utah) connected by 50kbps links
  - ARPANET (Advanced Research Projects Agency)
- 1972: ARPANET connected 15 nodes, Email was introduced

Leonard Kleinrock and the first **I**nterface **M**essage **P**rocessor (router)

The 1970's

- Different networks emerged
  - ALOHANet (microwave)
  - DARPA Satellite
  - BBN Commercial
- 1976: Ethernet by Metcalfe
- Internetwork these networks (Internet)
  - End of 1970s: TCP/IP by Kahn and Cerf
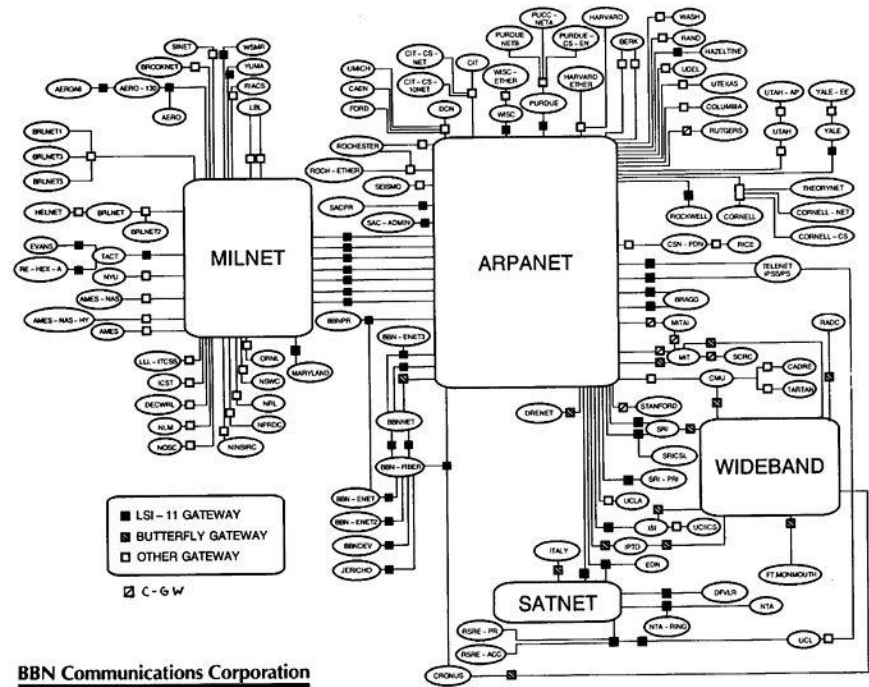- 1981: 213 hosts on ARPANET

Metcalfe's original conception of the Ethernet

Fig. From livinginternet.com

The 1980's

- 1982: TCP/IP formalized
- 1982: SMTP (Email)
- 1983: Domain Name System (DNS)
- 1986: Internet Engineering Task Force
- 1988 – OSI Reference Model released
- 1989 – Routing Protocols: BGP, RIP

BBN Communications Corporation

Contemporary map of the entire Internet, circa late-1985/early-1986 (exact date unknown). The little squares are routers, the small ovals are sites/networks (some sites included more than one physical network), and the large shapes are long-haul backbones. No individual hosts are shown.

The 1990's

- Early 1990's: Commercialization of Internet (ISPs)
- 1991: World Wide Web (WWW)
- 1995's: Many new applications
  - Instant Messaging, P2P, e-commerce (eBay, Amazon)
- 1998: Google Search
- 1999: WiFi (wireless)

Tim Berners-Lee invented the World Wide Web using this Next computer as the first Web server.

The 2000s

- 2003: Skype
- 2004: Facebook
- 2005: YouTube
- 2006: Twitter
- 2008: Cloud based services (E.g. Dropbox)
- 2010: Instagram (Photosharing)
- 2011: Google+

Summary

- We have come a long way
  - Fascinating history
- What does future hold?
  - Food for thought
  - Hoping you will add to these glorious inventions !