

COMPUTER NETWORKS

FIRST INTERNET

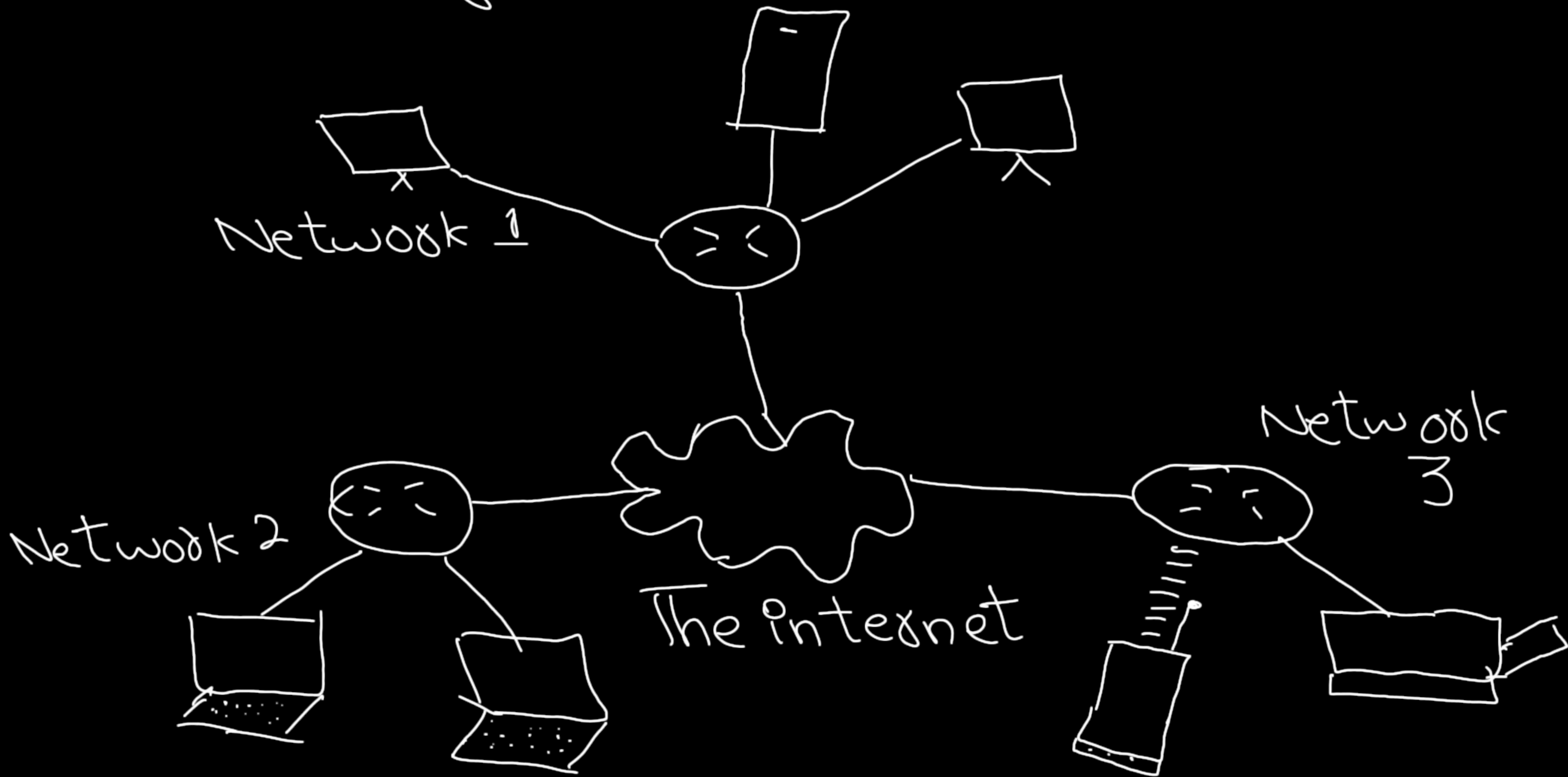
- ARPANET project, started in late 1960s
- First Documented network

World Wide Web (www)

- invented in 1989
- point where internet started to be used as a repository for storing and sharing information
- Tim Berners developed it

THE INTERNET

→ Internet looks like a much larger version of this sort of diagram



→ Internet is made up of small networks all joined together

NETWORKS:

- private
 - small networks
- public
 - internet

IDENTIFYING DEVICES ON A NETWORK

→ Two means of identification

- IP Address
- MAC Address

IP Address

- IP - Internet Protocol
- Unique address assigned to a device on the network
- Each device in a local network has a unique private IP, and the entire network shares one public IP on the internet, managed by the router.

- Public IP address

- identify device on the internet

- given by Internet Service Provider (ISP) at a monthly bill

- Private IP address

- identify device amongst other devices

- VERSIONS

- IPv4:

- Format: $nnn.nnn.nnn.nnn$

- where each set ranges from 0 to 255

- Supports: 4.3 billion addresses (2^{32})

- IPv6:

- new iteration of IP to tackle the shortage issue. E.g., Cisco, an industry giant in networking estimated that there would be

50 billion devices connected to the internet by end of 2021.

So IPv4 isn't enough.

- Format: eight groups of four hexadecimal digits

- Supports: 340 trillion-plus devices (2^{128})

MAC Address

- Media Access Control

- unique hardware identifier assigned to a network interface card (NIC)

- Format: twelve character hexadecimal number split in two's separated by a colon (separator)

- > First six characters represent the company that made Network interface, and last six is a unique number
 - MAC address can be faked or spoofed in a process called spoofing.
-

PING (ICMP)

- Networking tool
- Uses Internet control message protocol (ICMP) packets to determine performance of a connection b/w devices.
- ICMP -> special network messages used for diagnostics and error reporting.

• Time taken for ICMP packets travelling b/w devices is measured by ping.