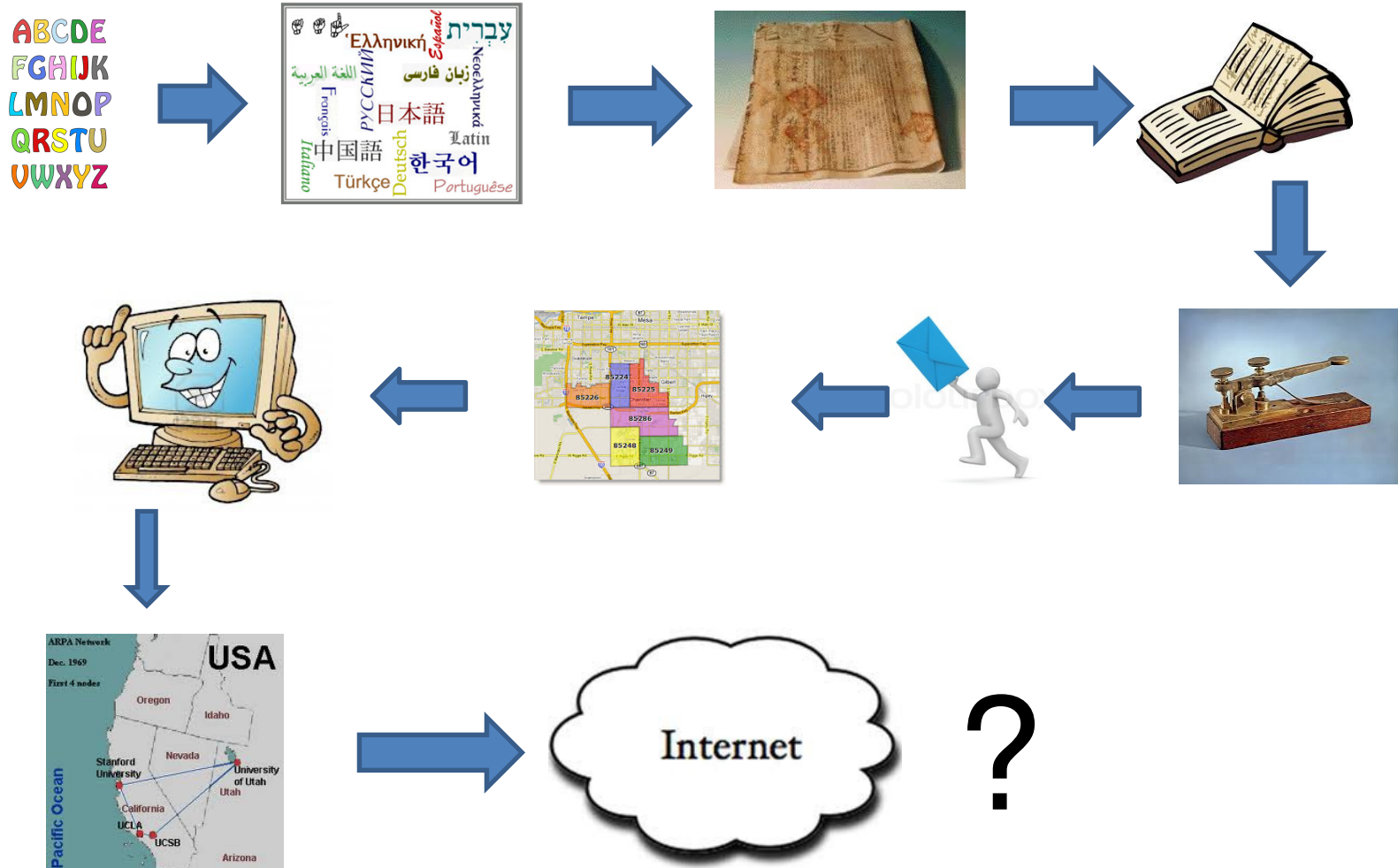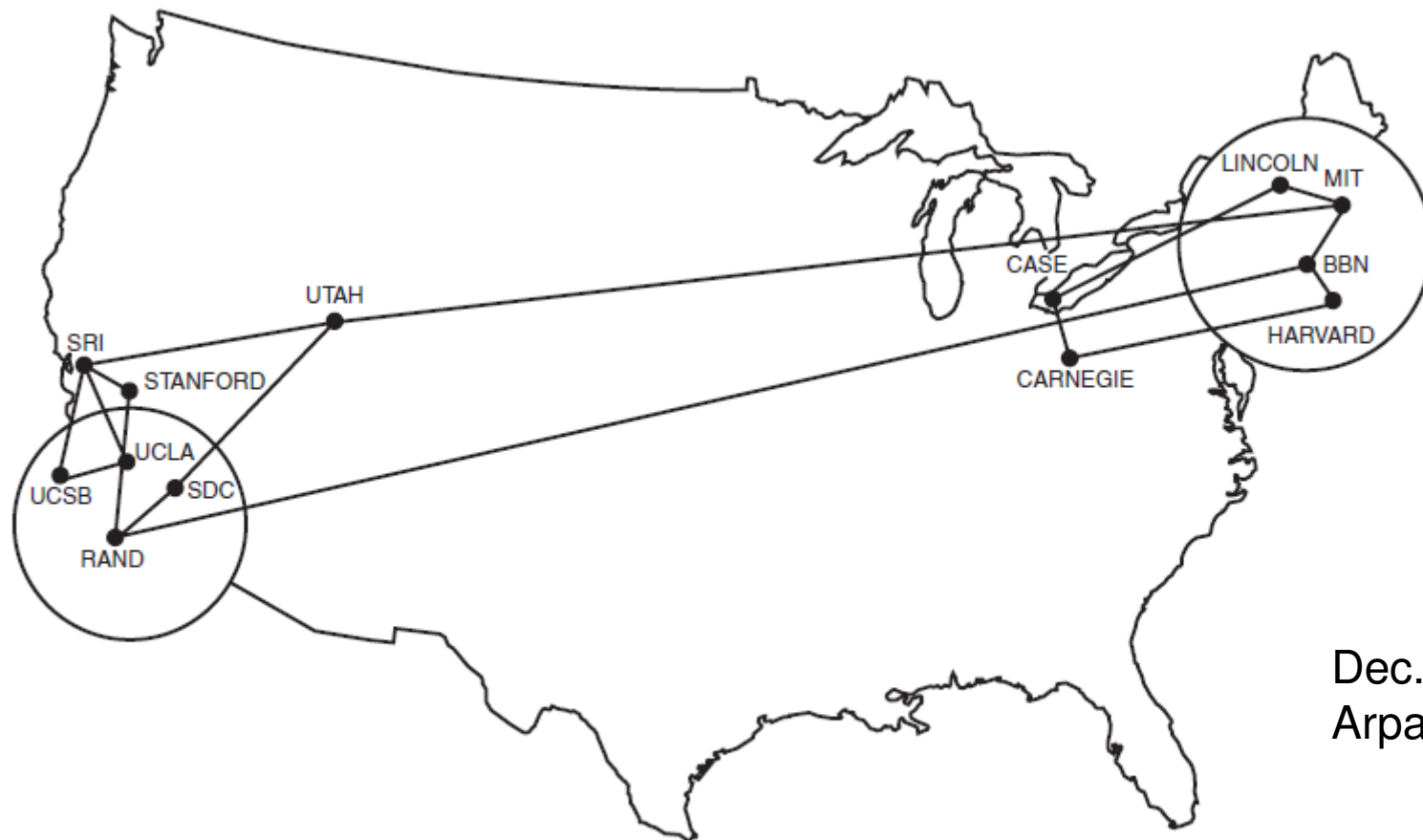# UNIT 11A
The Internet: Fundamentals

Communication technologies
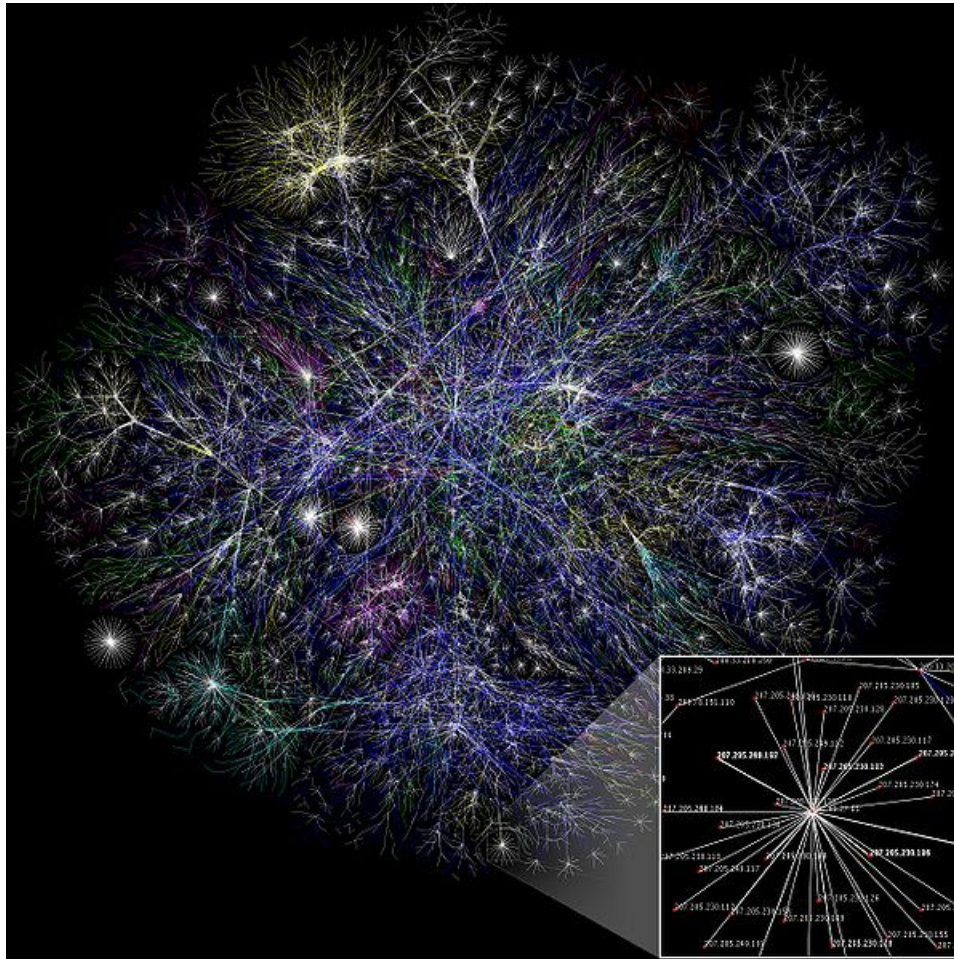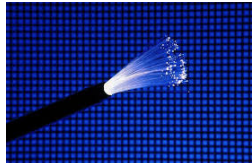
ARPANET

Dec. 1970
Arpanet

Source: Heart, F., McKenzie, A., McQuillian, J., and Walden, D., ARPANET Completion Report, Bolt, Beranek and Newman, Burlington, MA, January 4, 1978.

ARPANET to Internet

2000's
Internet Map
(small section)

The wires that connects internet

Servers

Google.com

IP Address

Facebook.com

IP Address

A computer that runs services..
What kind of services?

IP4 Addresses

128.237.122.178

QUIZ: How many different IP4 addresses can we have?

Components of an IP address

- Each device that is connected to a network has an IP address
  - 192.168.66.5

  - 127.0.0.1

Your home network

Adhoc networks

Simplehelp.net

How emails work

AOL

Mail server

ISP

Gmail.com

How data is sent

Formatted, encoded

How packets work

ISP

Packet Framing

Control Data

User data

Communication protocols

Error detection

Bit , byte, header, delimiters

Communication

Communication Protocols

- Digital message formats and rules for exchanging those messages
  - signaling, authentication, error detection and correction capabilities.
- Protocols have to be agreed upon by the parties involved. To reach agreement a protocol may be developed into a technical standard.
- Standards Bodies
 - International Standards Organization (ISO), Internet Society, W3C

Wireless Data Communication

- Wireless data communication using radio, microwave, and infrared signals
  - Wireless local access network: user transmits messages to a local wireless base station referred to as a wireless router. Typically used in homes, coffee shops.
  - Wireless wide area access network: user transmits messages to a remote base station provided by a telecommunications company.

Examples
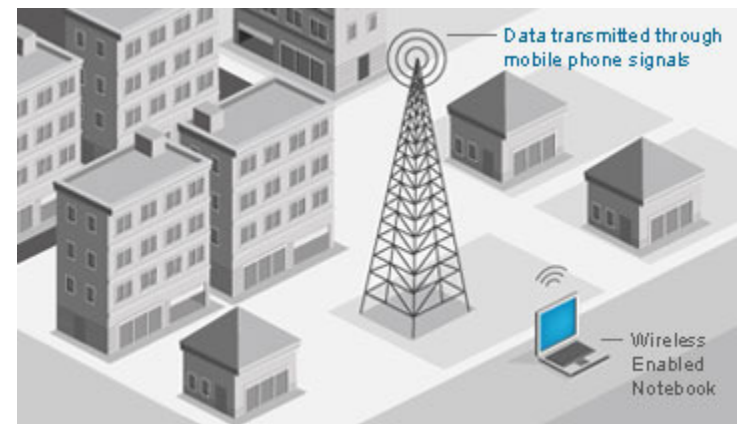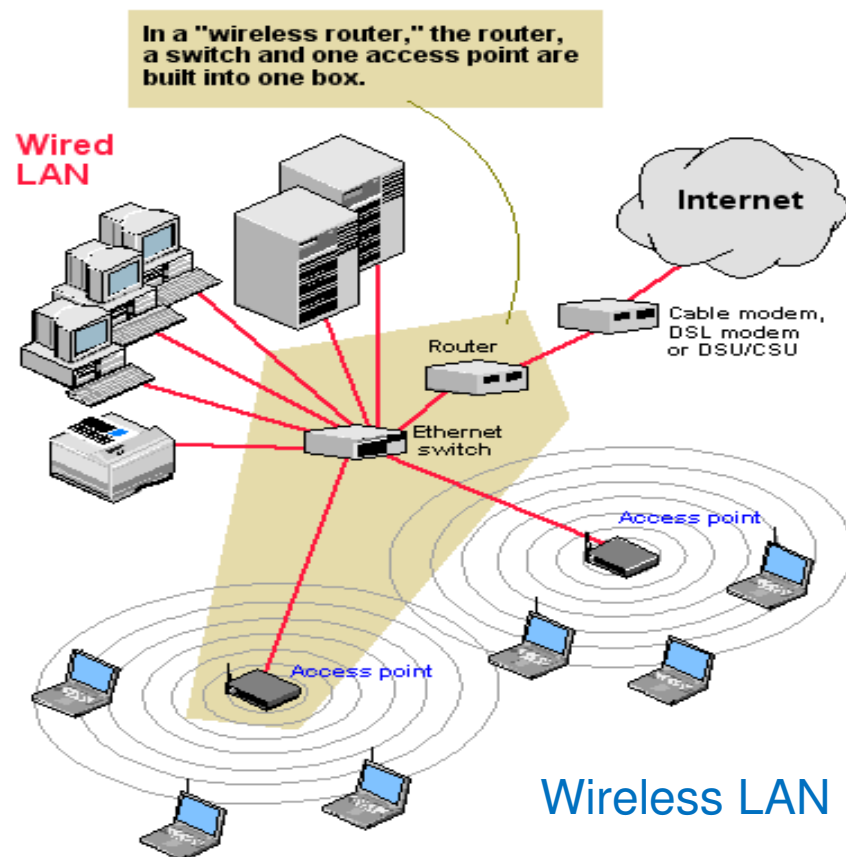
Wireless LAN

Wireless WAN

Wireless Local Access Standards

- Wi-Fi (Wireless Fidelity). Officially IEEE 802.11 wireless network standards.
  - Wireless version of a wired local area network

- Bluetooth
  - Low-power wireless standard for communication between devices close to each other
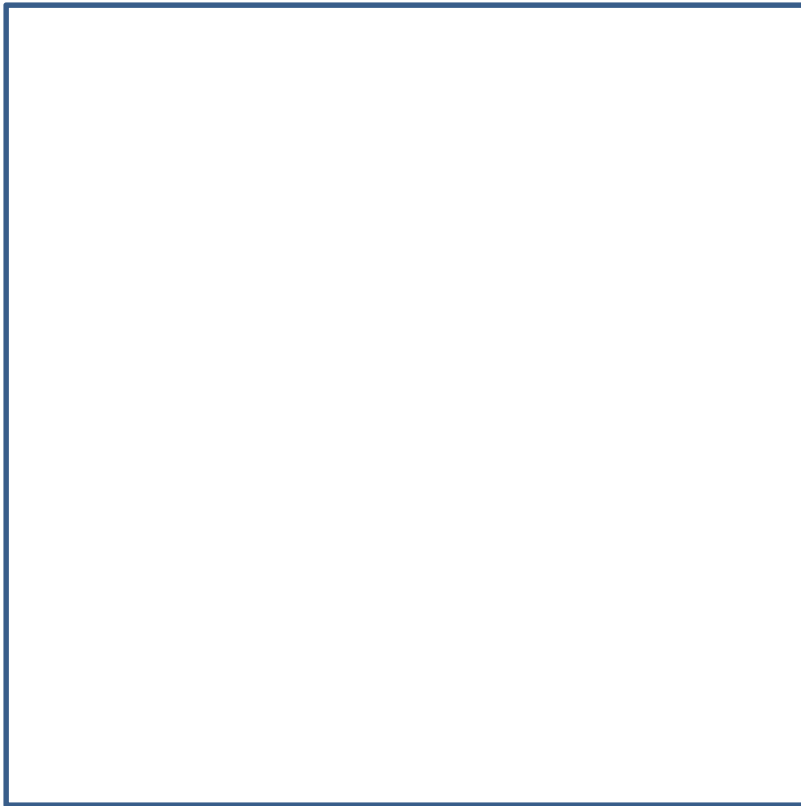
WWW

world wide web

The **World Wide Web** (abbreviated as **WWW** or **W3**,[2] commonly known as **the Web**), is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view web pages that may contain text, images, videos, and other multimedia, and navigate between them via hyperlinks.

- source: wikipedia

Webpages

Rest of the Week

- Closer look at the Internet protocol stack, web applications

- Security over the Internet

- Recommended reading: Blown to Bits Chapter 5 and the Appendix