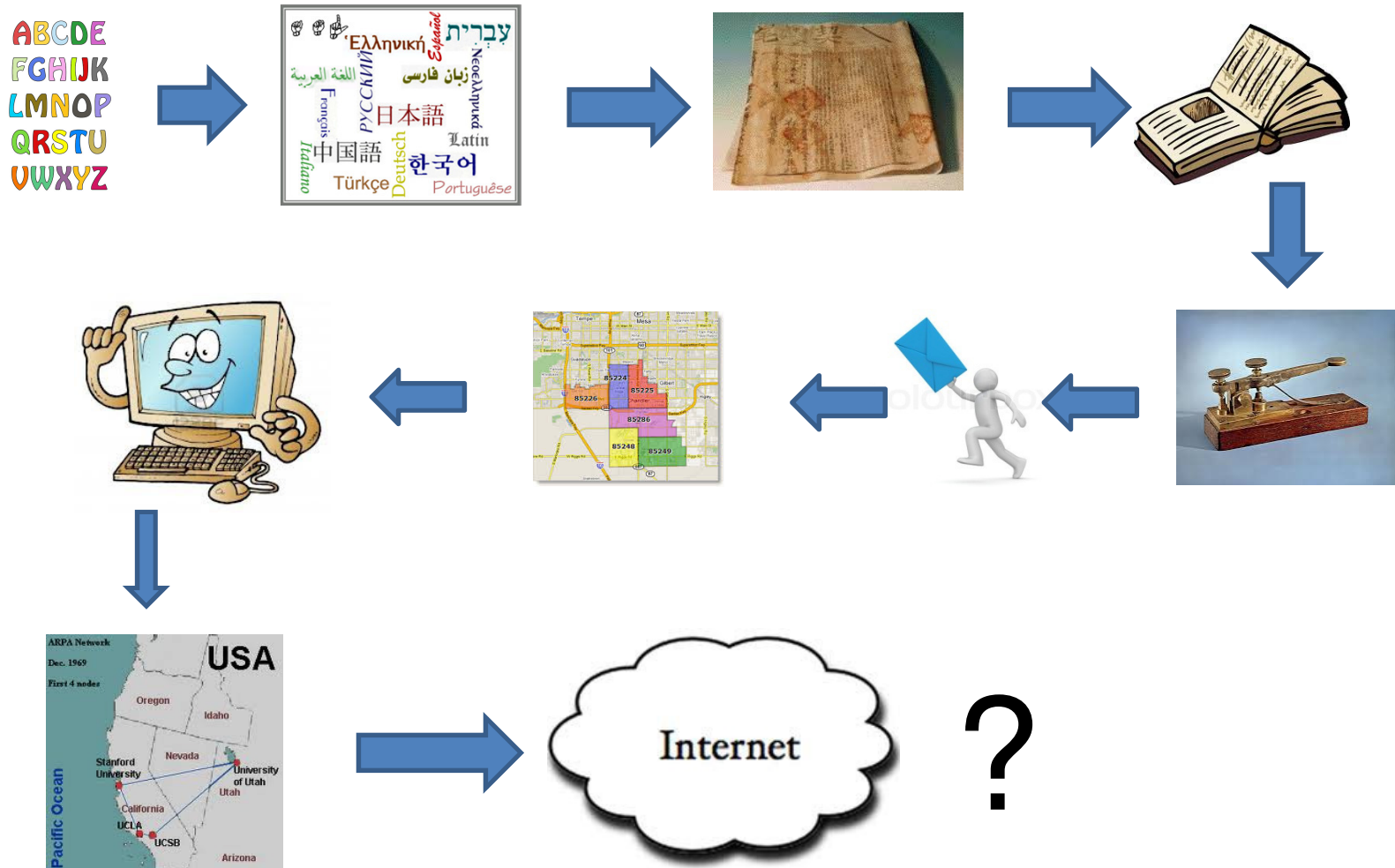


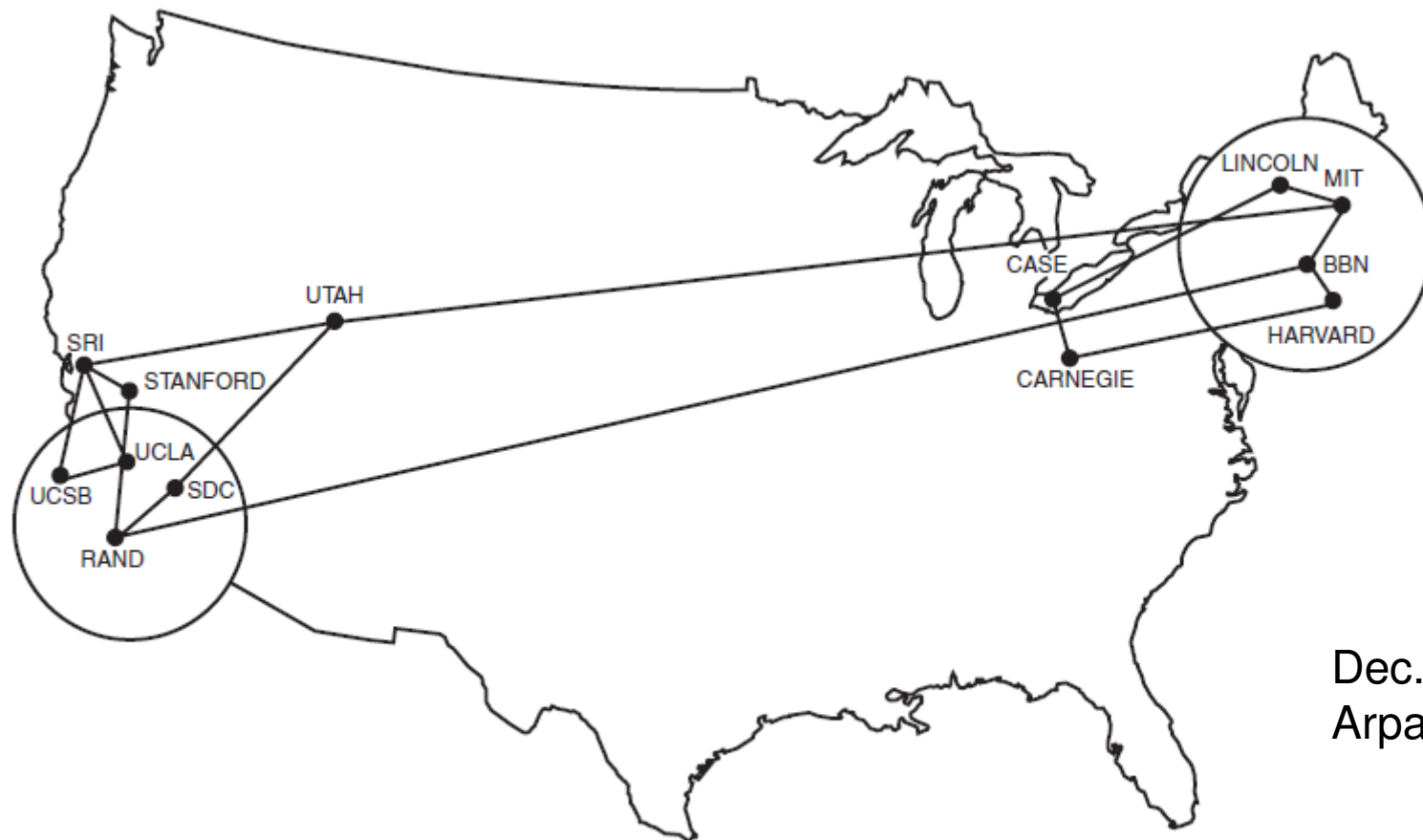
UNIT 11A

The Internet: Fundamentals

Communication technologies



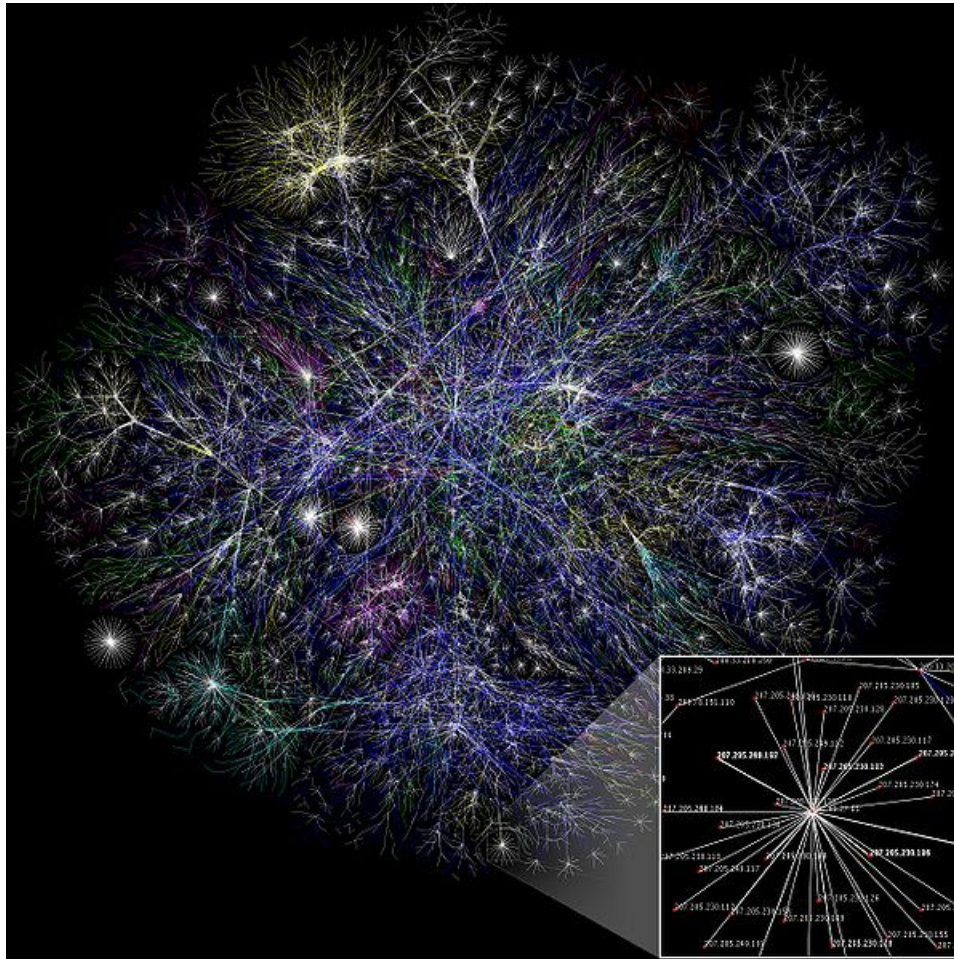
ARPANET



Dec. 1970
Arpanet

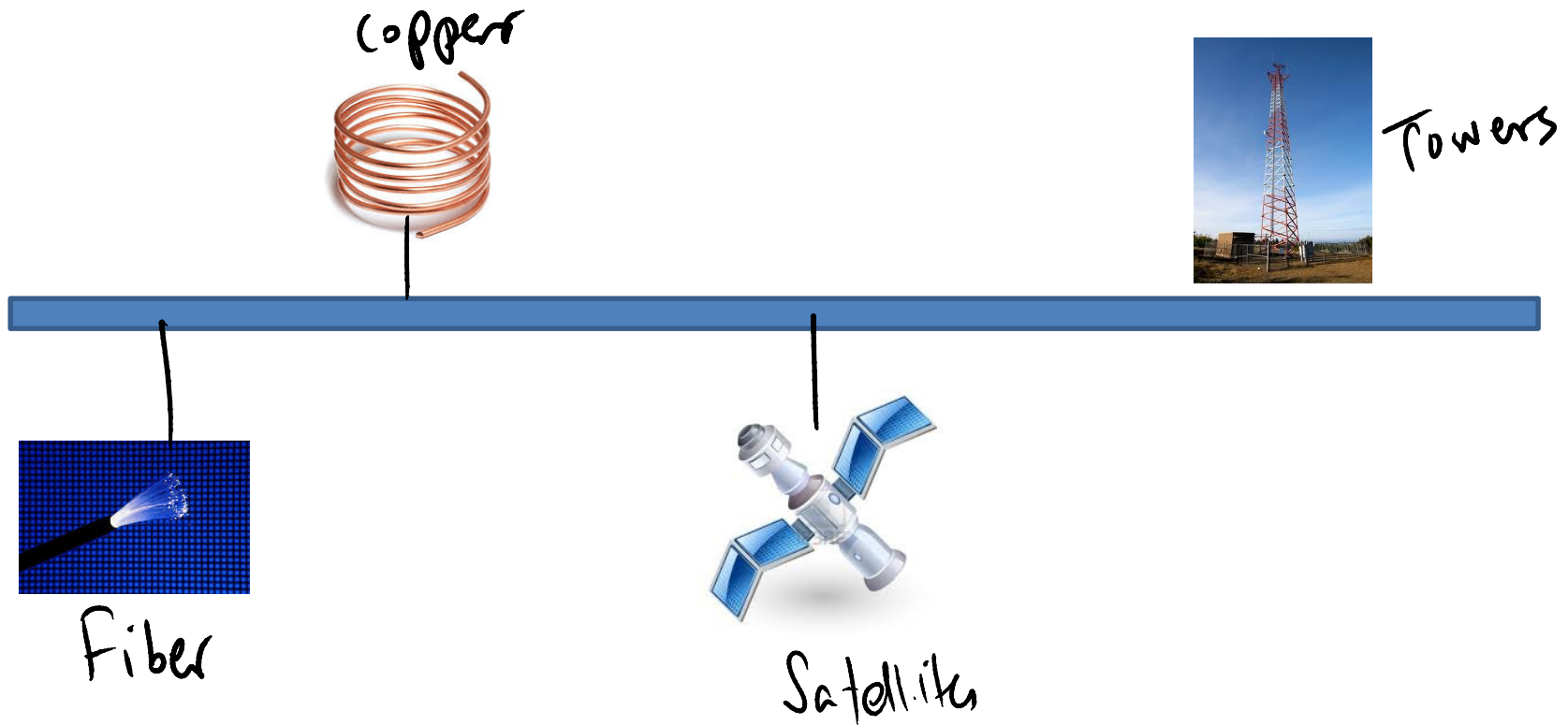
Source: Heart, F., McKenzie, A., McQuillian, J., and Walden, D., ARPANET Completion Report, Bolt, Beranek and Newman, Burlington, MA, January 4, 1978.

ARPANET to Internet



2000's
Internet Map
(small section)

The wires that connects internet



Servers

Google.com



IP Address

Facebook.com



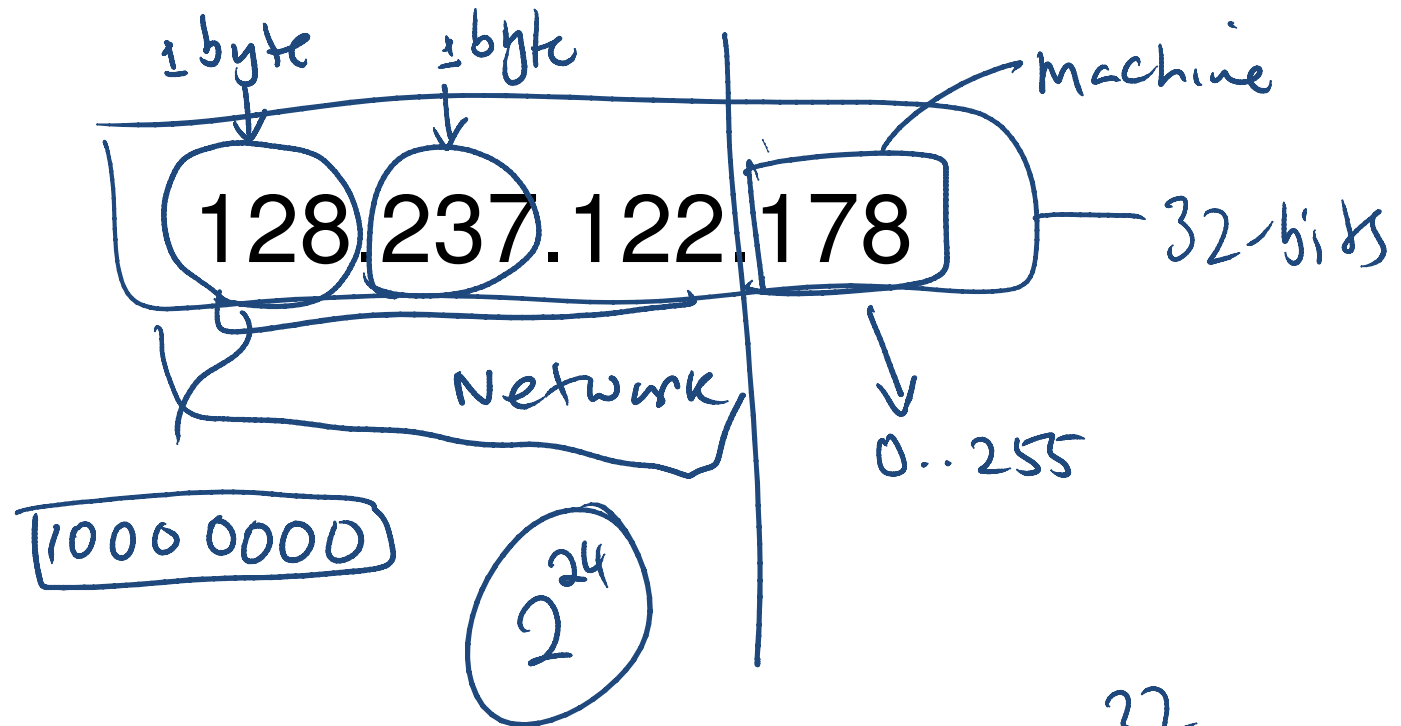
IP Address

A computer that runs services.
What kind of services?

- mail servers
- application servers
- Netflix server

IP4 Addresses

IP6 - 128 bits



QUIZ: How many different IP4 addresses can we have?

2^{32}

Components of an IP address

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

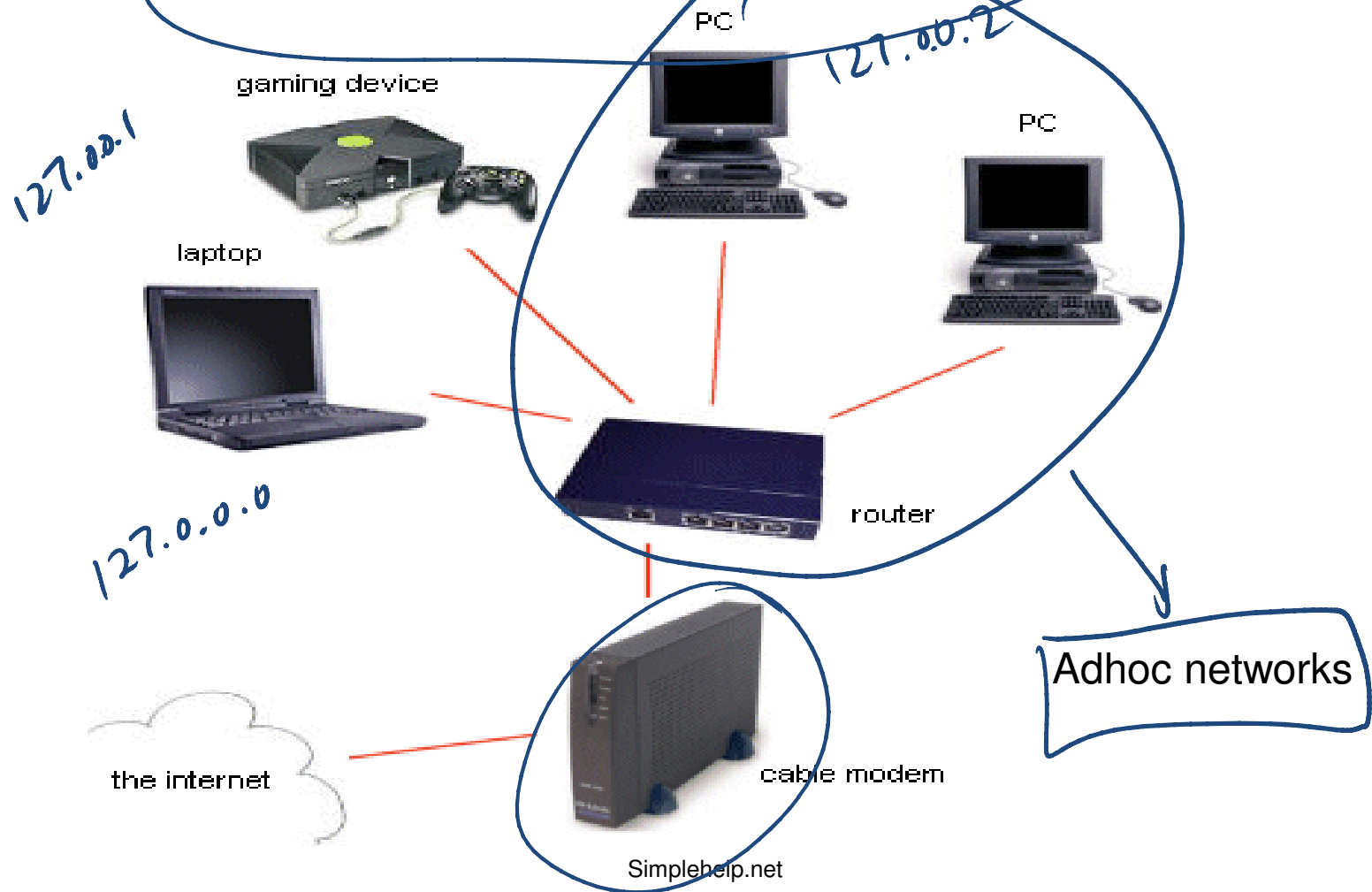
= 192.168.66.5

global IP

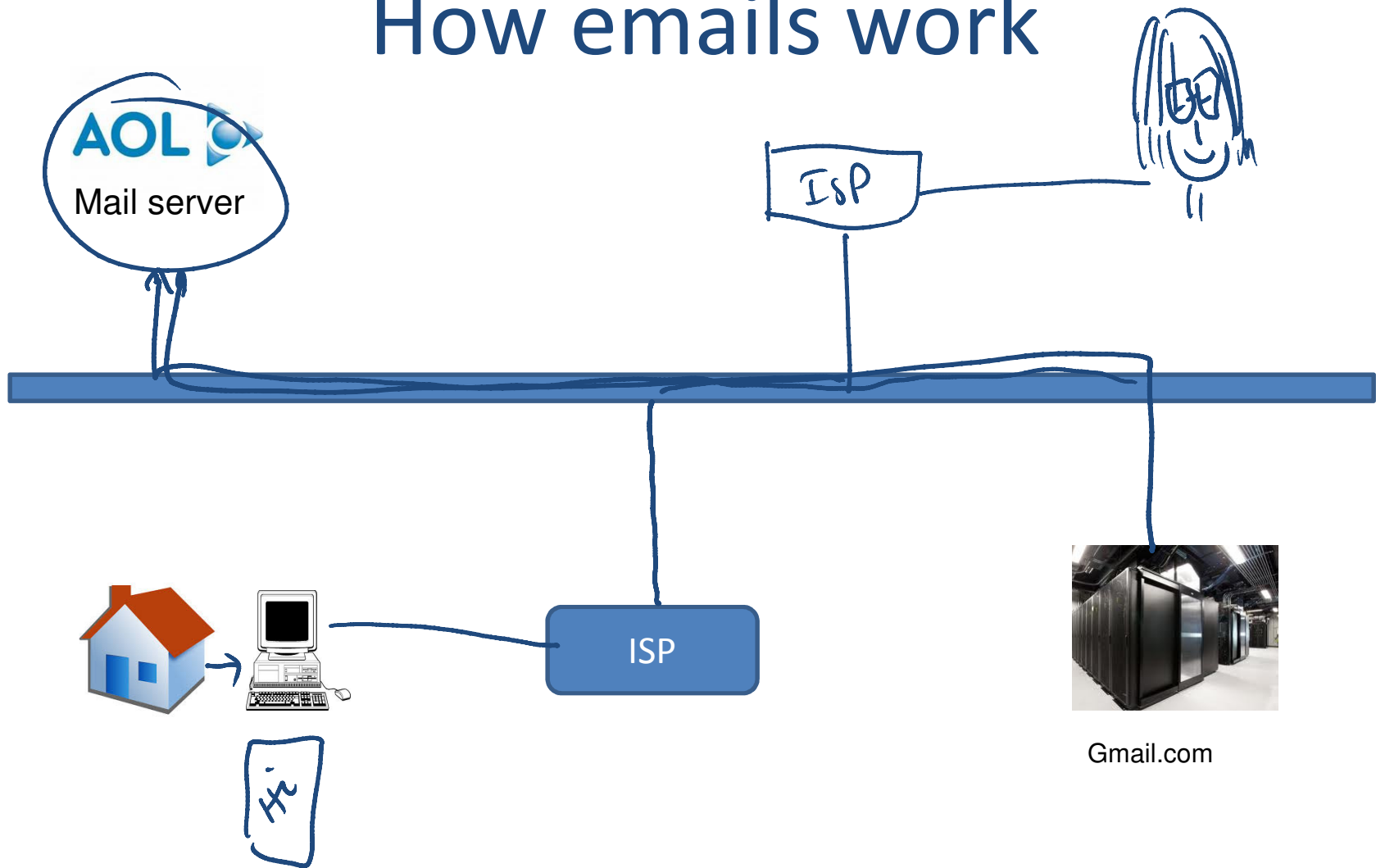
= 127.0.0.1

local IP

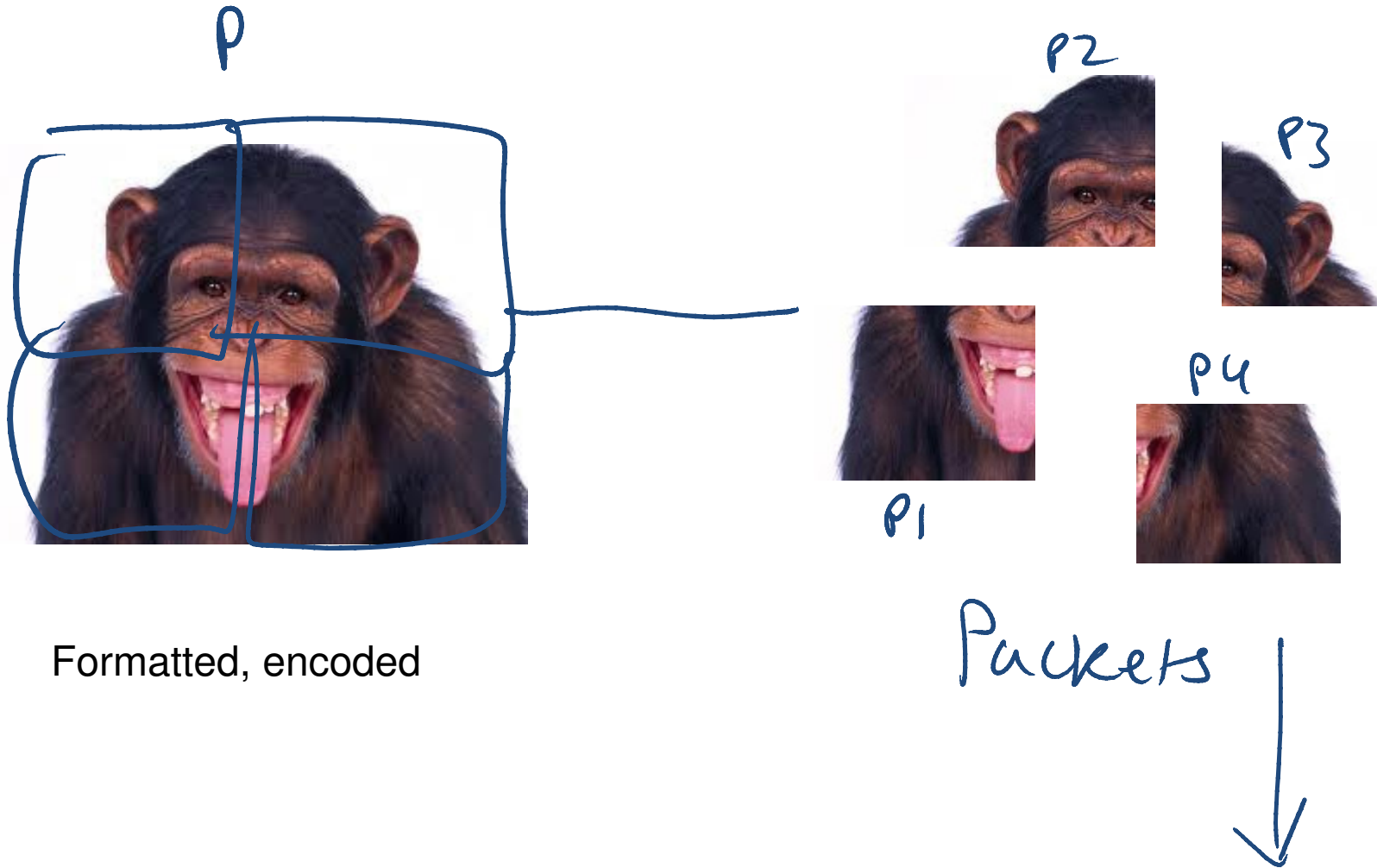
Your home network



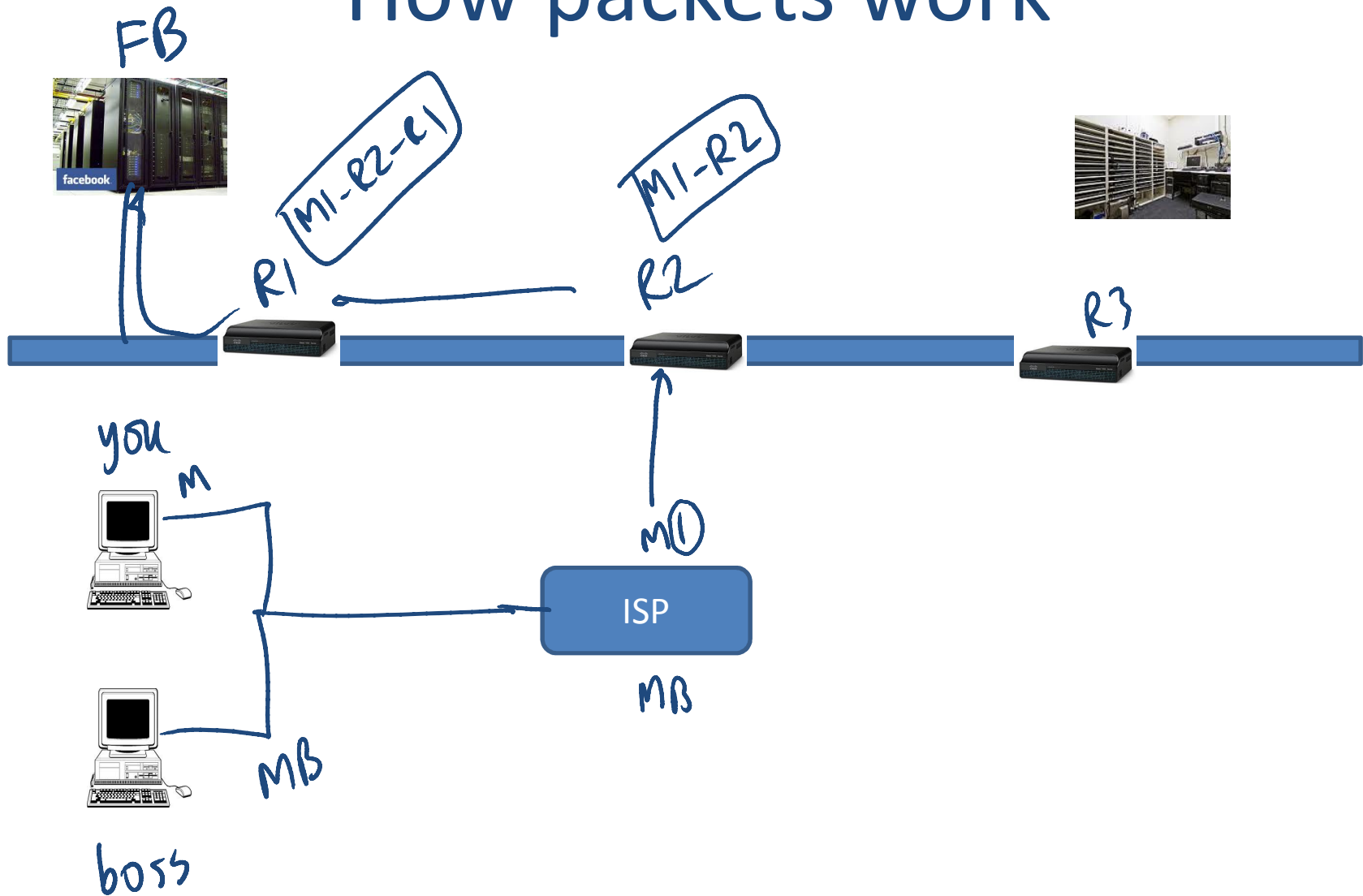
How emails work



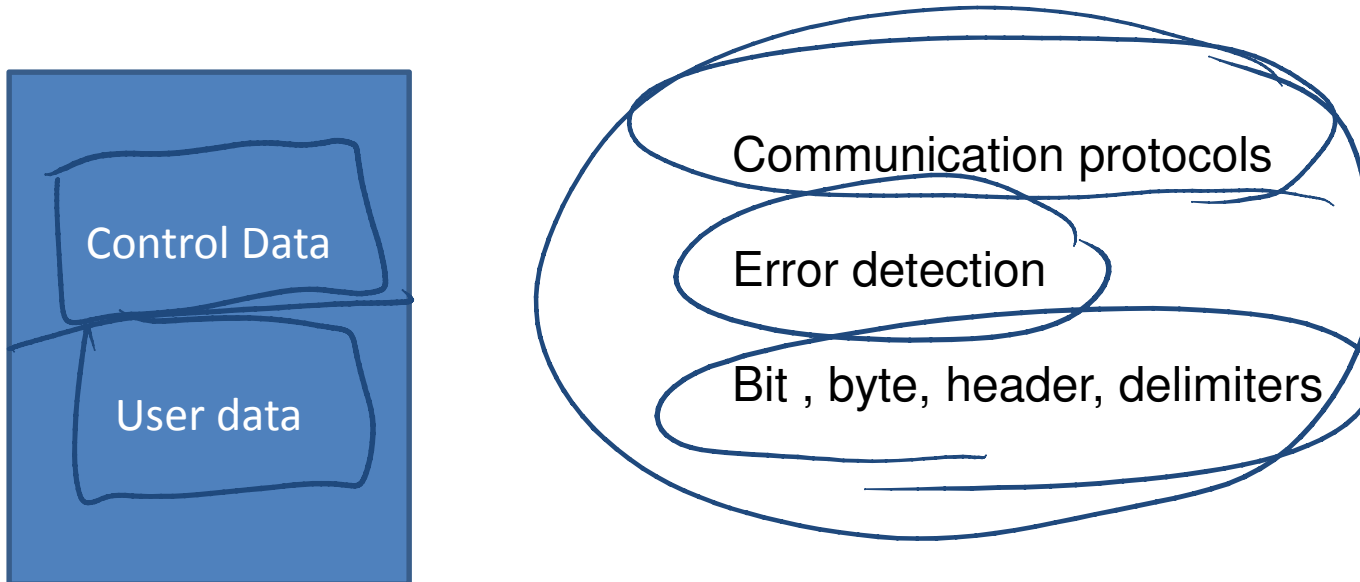
How data is sent



How packets work



Packet Framing



Communication

Communication Protocols

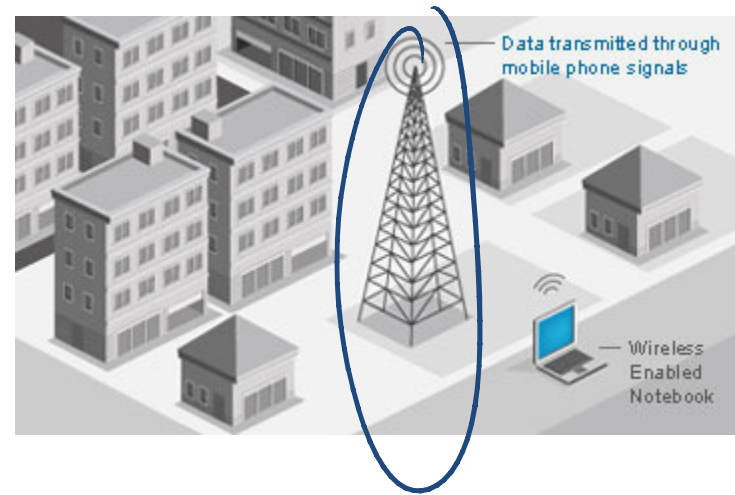
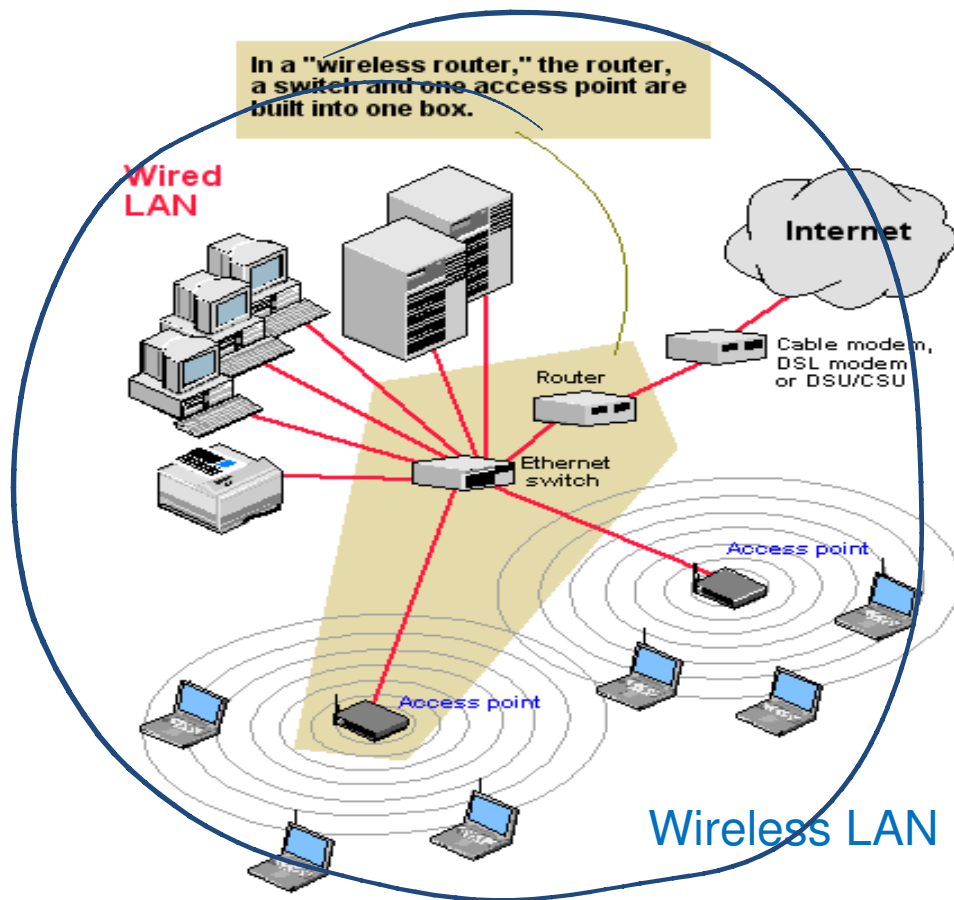
- Digital message formats and rules for exchanging those messages
 - signaling, authentication, error detection and correction capabilities.
- Protocols have to be agreed upon by the parties involved. To reach agreement a protocol may be developed into a technical standard.
- Standards Bodies
 - International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

From Computer Desktop Encyclopedia
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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

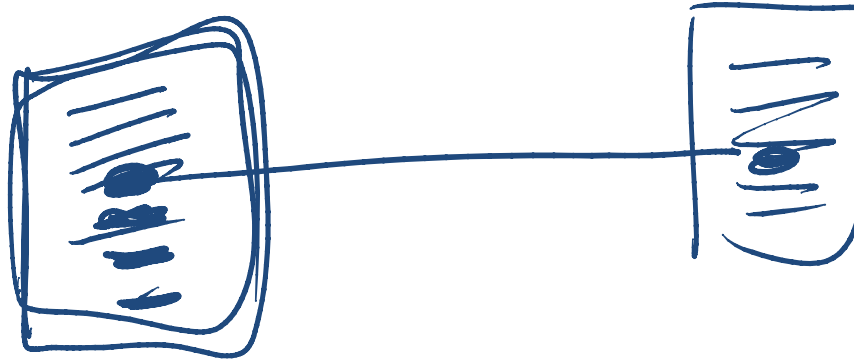


www

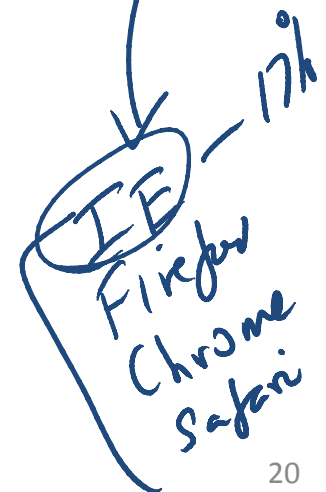
world wide web

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.

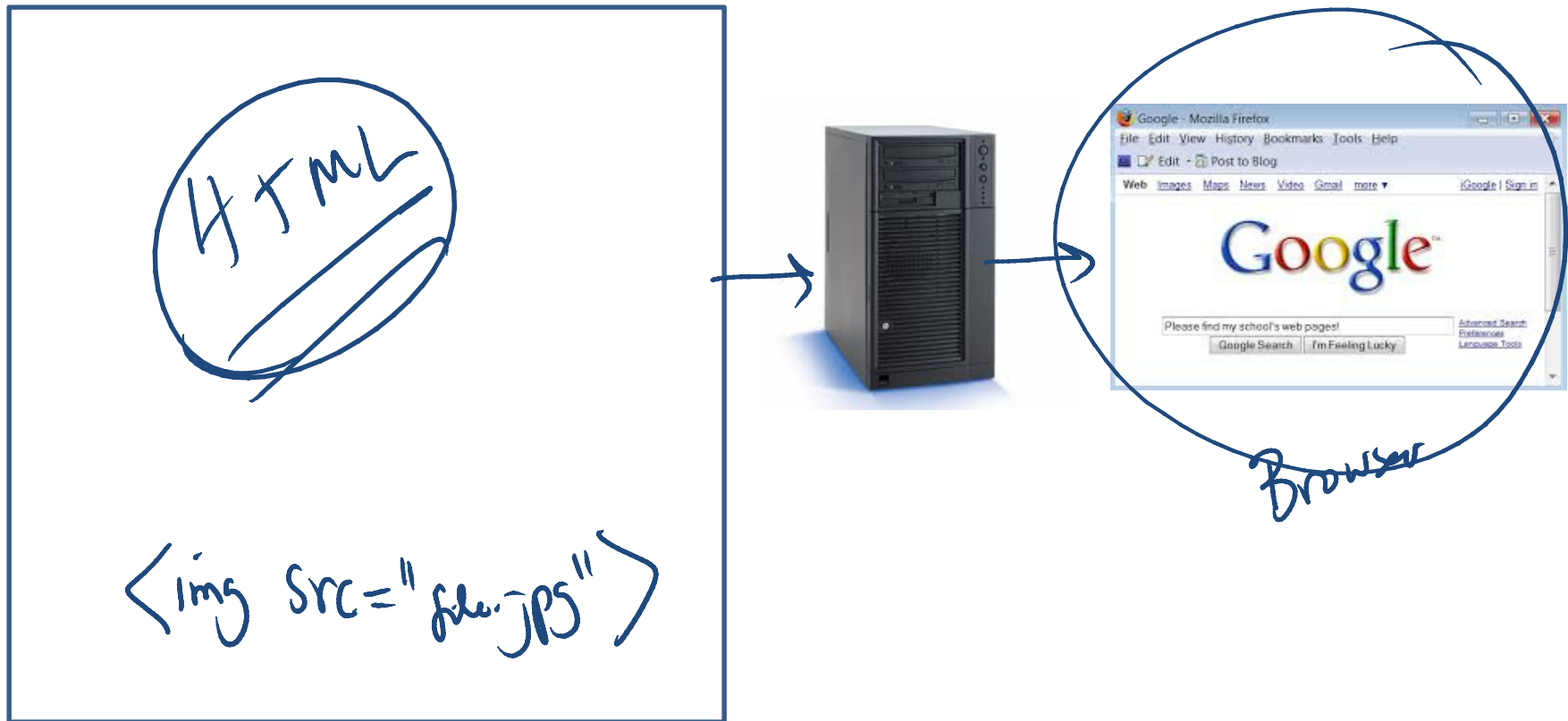
- source: wikipedia



HTML



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