

THE INTERNET



- Introduction
- History
- The World Wide Web
- Using and accessing
- Searching

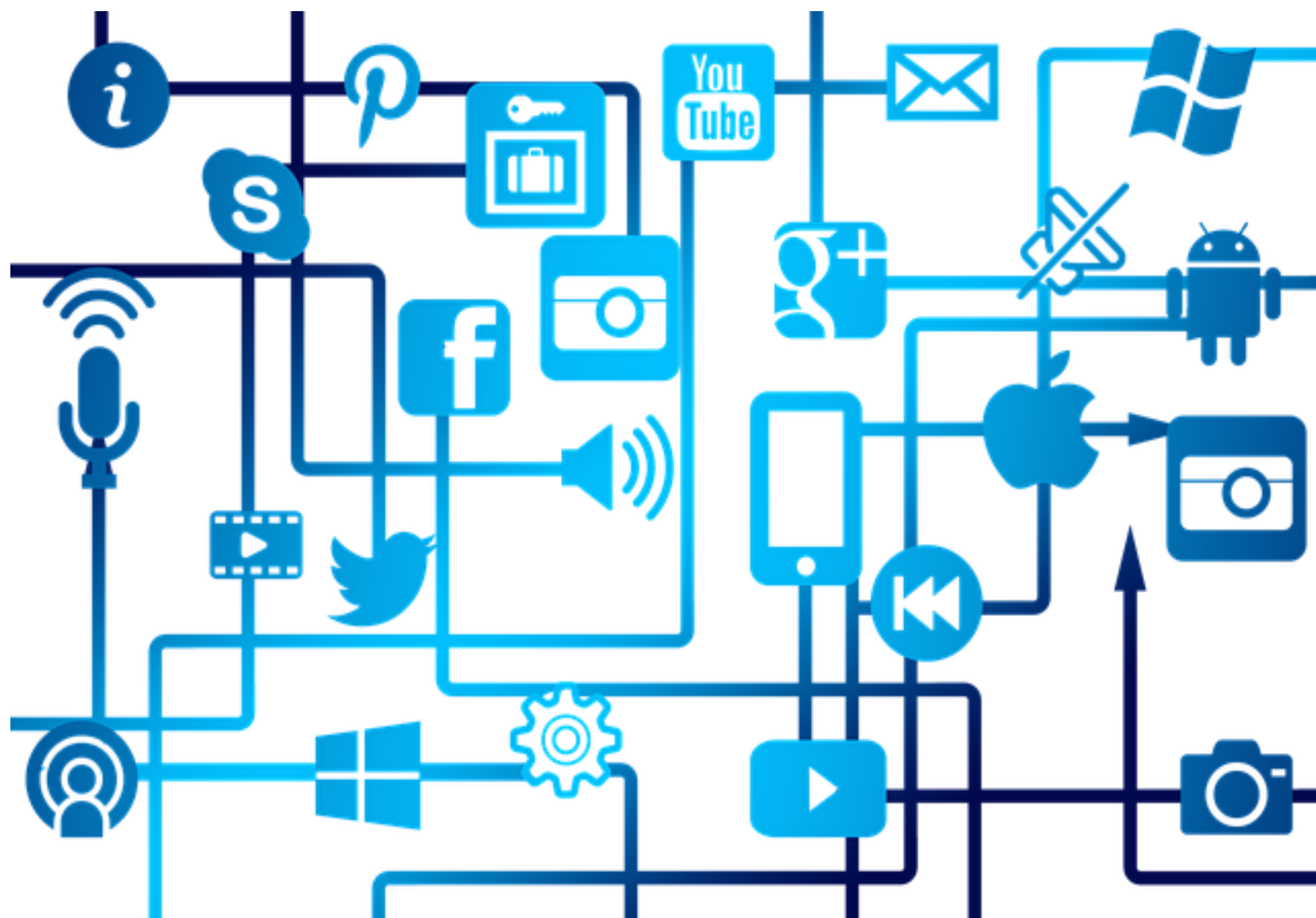
Even if you have not had a lot of experience with computers, it wouldn't be surprising to learn that you have been on the Internet. In the past few years, millions of people have gone online—and some of them probably never thought they'd use a computer. Indeed, many Internet enthusiasts buy computers just so they can go online, and for no other reason!

BUT

What exactly is the
internet?



- The Internet is a network of networks—a global communications system that links together thousands of individual networks.
- As a result, virtually any computer on any network can communicate with another on any other network.



These connections allow users to

- exchange messages,
- communicate in real time,
- share data and programs,
- access limitless stores of information.

The Beginning: A "Network of Networks"

— SATELLITE CIRCUIT
○ IMP
□ TSP
▲ PLUMBIC IMP

(NOTE: THIS MAP DOES NOT SHOW ARPANET EXPERIMENTAL
SATELLITE CONNECTIONS)

NAMES SHOWN ARE IMP NAMES, NOT NECESSARILY HOST NAMES

The seeds of the Internet were planted in

- 1969
- ADVANCED RESEARCH PROJECT AGENCY – ARPA
(U.S. Department of Defense)
- began connecting computers
- at different universities and defense contractors
- ARPANET



ARPA, 1958-1972

The **goal** of this early project was

- to create a large computer network
- with multiple paths
- in the form of telephone lines
- that could survive a **nuclear attack** or a **natural disaster** such as an earthquake.

At first, ARPANET was basically a

- large network
- serving only a handful of users,
- but it expanded rapidly.

- jumped across the Atlantic to Europe
- in 1973,
- and it never stopped growing.



After the Defense Department stopped funding the network in the mid-1980s,

- another federal agency
- the NATIONAL SCIENCE FOUNDATION - NSF
- joined the project.



**National Science
Foundation**

- NSF
 - established **five** “supercomputing centers”
 - that were available to anyone who wanted to use them
 - for academic research purposes.
- quickly discovered
 - the existing network
 - **could not handle the load**.
- created a
 - new, higher-capacity network,
 - called **NSFnet**
- The link between ARPANET, NSFnet, and other networks
 - was called the **Internet**

- The NSF did not permit private business
- therefore, several private telecommunications companies built their own network
- these private portions of the Internet
- were not limited by NSFnet as "appropriate use" restrictions,
- so it became possible to use the Internet
- to distribute business and commercial information.
- The original ARPANET was shut down in 1990,
- and government funding for NSFnet was discontinued in 1995,
- but the commercial Internet backbone services replaced them
- by the early 1990s, interest in the Internet began to expand dramatically

The system that had been created as a tool for surviving a nuclear war found its way into businesses and homes. Now, advertisements for movies are far more common online than collaborations on physics research.



Today: Still Growing

Today, the Internet connects thousands of networks and hundreds of millions of users around the world.



It is a

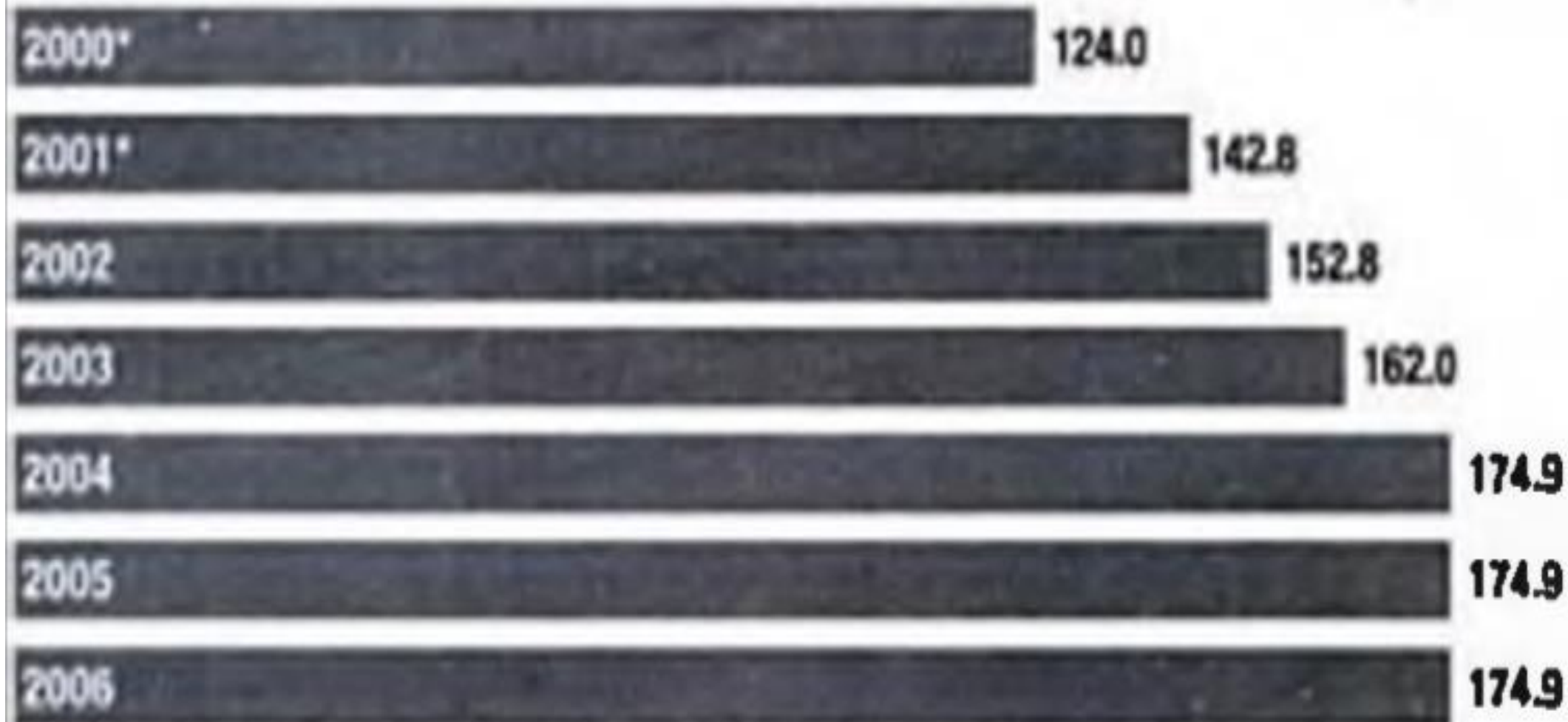
- huge, cooperative community
- with no central ownership.

This **lack of ownership** is an important feature of the Internet, because it means that no single person or group controls the network.

- The Internet is open to anyone who can access it.
- If you can use a computer
- and if the computer is connected to the Internet,
- you are free not only to use the resources posted by others, but to create resources of your own

This openness has attracted millions of users to the Internet. Internet access was available to nearly one-half billion people worldwide in 2001. The number of actual users continues to climb dramatically.

Internet Users in the US, 2000-2006 (in millions)





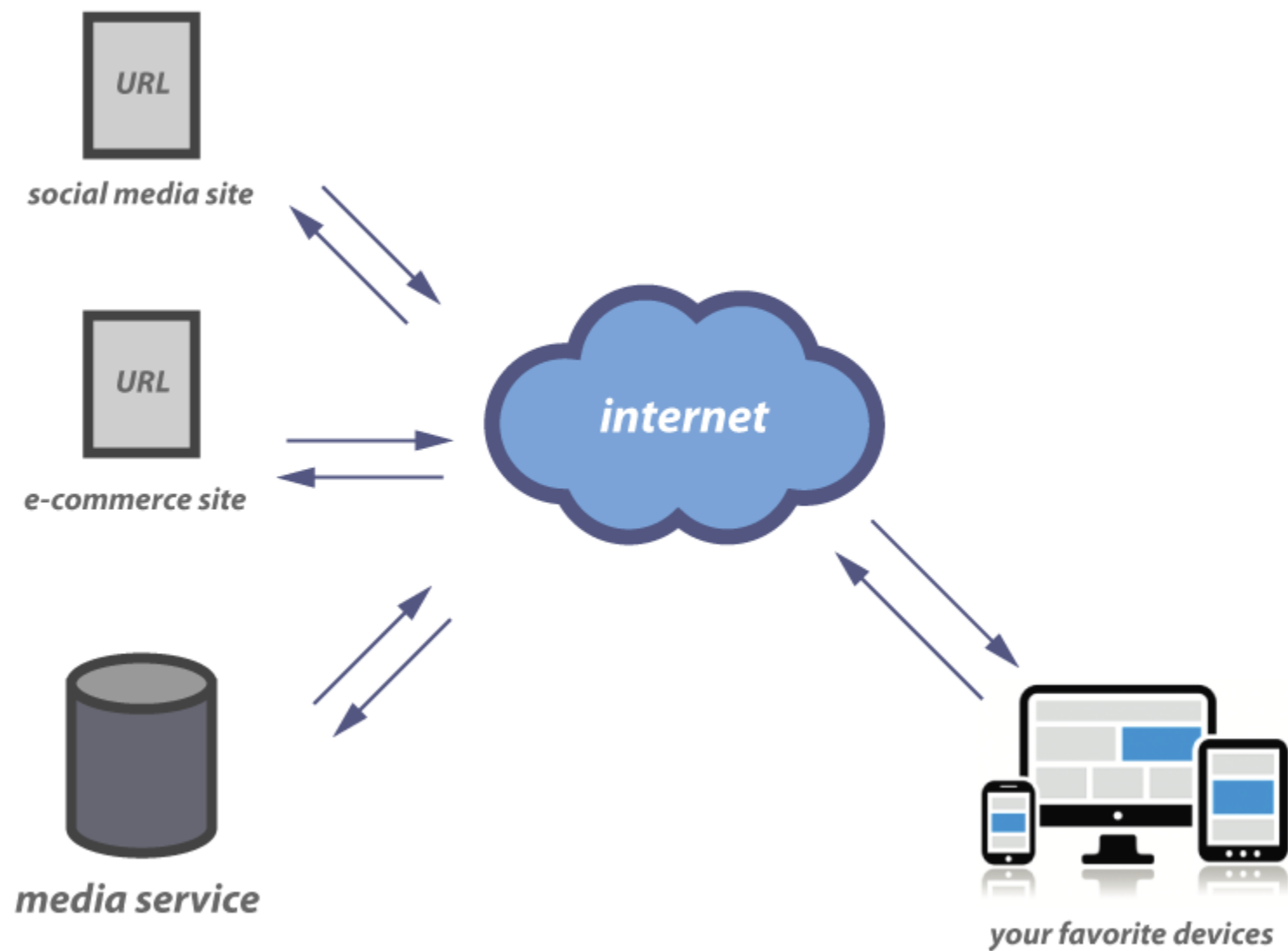
- Send e-mail messages.
- Send (upload) or receive (down load) files between computers.
- Participate in discussion groups, such as mailing lists and newsgroups.
- Surfing the web.



What is Web?

- The Web (World Wide Web) consists of information organized into Web pages containing text and graphic images.
- It contains hypertext links, or highlighted keywords and images that lead to related information.
- A collection of linked Web pages that has a common theme or focus is called a Web site.
- The main page that all of the pages on a particular Web site are organized around and link back to is called the site's home page.

How to access the
Internet?



- Many schools and businesses have direct access to the Internet using special high-speed communication lines and equipment.
- Students and employees can access through the organization's local area networks (LAN) or through their own personal computers.
- Another way to access the Internet is through Internet Service Provider (ISP).
- To access the Internet, an existing network need to pay a small registration fee and agree to certain standards based on the TCP/IP (Transmission Control Protocol/Internet Protocol) reference model.
- Each organization pays for its own networks and its own telephone bills, but those costs usually exist independent of the internet.
- The regional Internet companies' route and forward all traffic, and the cost is still only that of a local telephone call.

Internet Service Provider (ISP)

- A commercial organization with permanent connection to the Internet that sells temporary connections to subscribers.
- Examples: Prodigy, America Online, Microsoft network, AT&T Networks.





How to access
the Web?

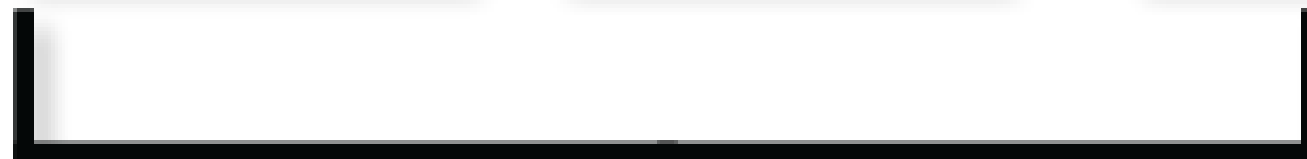
- Once you have your Internet connection, then you need special software called a **browser** to access the Web.
- Web browsers are used to **connect you to remote computers, open and transfer files, display text and images.**
- Web browsers are specialized programs.
- Examples of Web browser: Netscape Navigator (Navigator) and Internet Explorer.



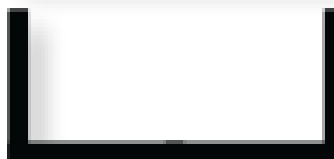
Addresses on the Web: IP Addressing

- Each computer on the internet does have a **unique identification number**, called an IP (Internet Protocol) address.
- The IP addressing system currently in use on the Internet uses a **four-part number**.
- Each part of the address is a number ranging from **0 to 255**, and each part is separated from the previous part by period,
- For example, 106.29.242.17
- The combination of the four IP address parts provides **4.2 billion possible addresses** ($256 \times 256 \times 256 \times 256$).
- This number **seemed adequate until 1998**.
- Members of various Internet task forces are working to develop an **alternate addressing system** that will accommodate the projected growth.
- However, all of their working solutions require extensive hardware and software changes throughout the Internet.

192.168.1.34



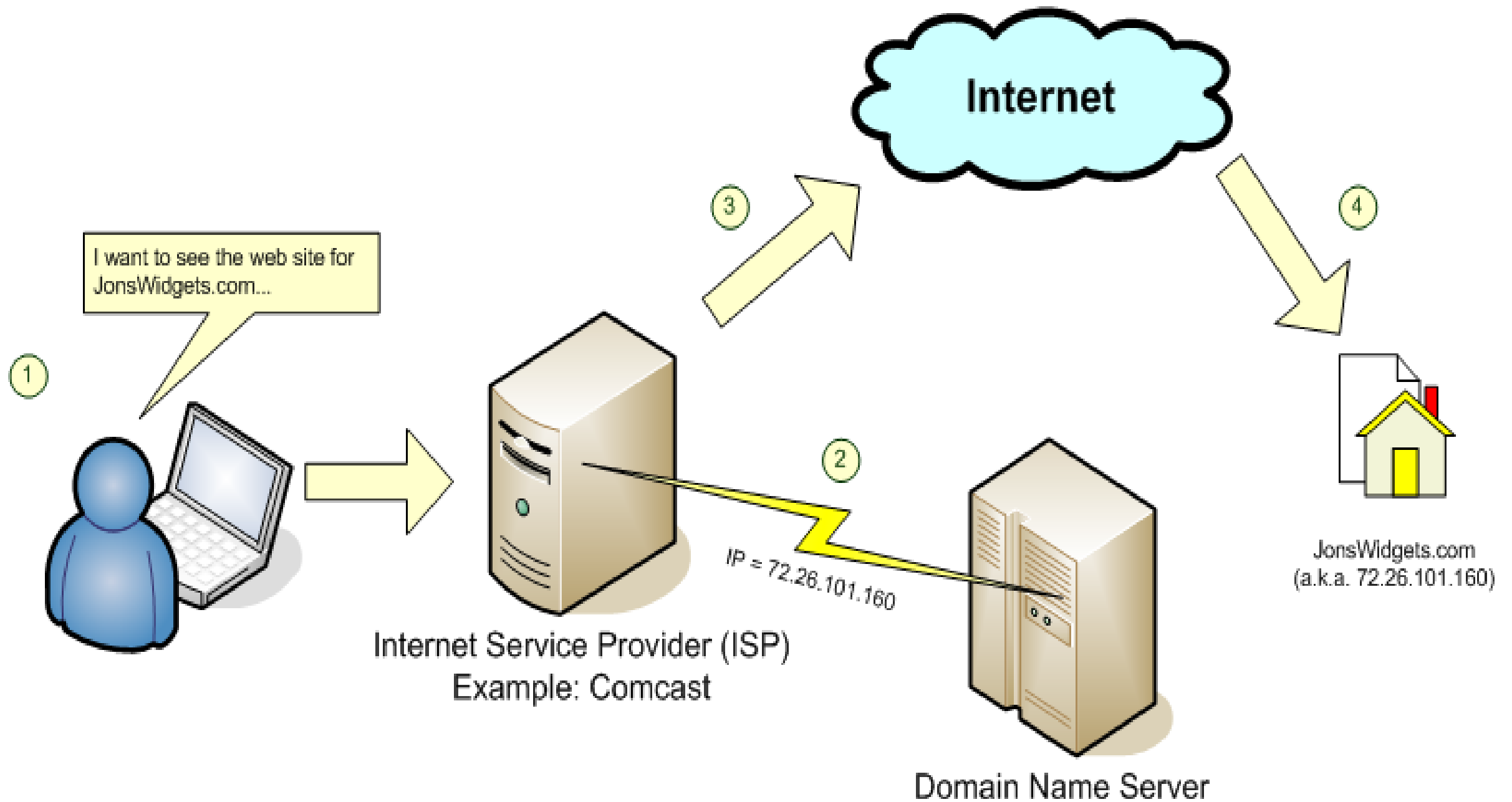
Network ID



Host ID

Domain Name Addressing

- Most web browsers **do not use the IP address** to locate Web sites and individual pages. They use domain name addressing.
- A domain name is a **unique name associated with a specific IP address** by a program that runs on an Internet host computer.
- This program, which **coordinates the IP addresses and domain names** for all computers attached to it, is called DNS (Domain Name System) software.
- The host computer that runs this software is called a **domain name server**.
- Domain names can include **any number of parts separated by periods**, however most domain names currently in use have only three or four parts.
- Domain names follow **hierarchical model** that you can follow from top to bottom if you read the name from the **right to the left**.
- For example, the domain name gsb.uchicago.edu is the computer connected to the Internet at the Graduate School of Business (gsb), which is an academic unit of the University of Chicago (uchicago), which is an educational institution (edu).
- No other computer on the Internet has the same domain name



Uniform Resource Locators

- The IP address and the domain name each identify a particular computer on the Internet.
- However, they do not indicate where a Web page's HTML document resides on that computer.
- To **identify a Web pages exact location**, Web browsers rely on Uniform Resource Locator (URL).
- URL is a **four-part addressing scheme** that tells the Web browser:
 - What transfer protocol to use for transporting the file
 - The domain name of the computer on which the file resides
 - The pathname of the folder or directory on the computer on which the file resides
 - The name of the file

ools

Help

URL: <http://www.internet.com>



Structure of a Uniform Resource Locator

The diagram illustrates the structure of a Uniform Resource Locator (URL) using the example `http://www.chicagosymphony.org/civicconcerts/index.htm`. The components are labeled as follows:

- protocol**: `http`
- Domain name**: `www.chicagosymphony.org`
- pathname**: `/civicconcerts/`
- filename**: `index.htm`

Brackets are used to group these components under their respective labels. The `http` is bracketed under 'protocol'. The `www.chicagosymphony.org` is bracketed under 'Domain name'. The `/civicconcerts/` is bracketed under 'pathname'. The `index.htm` is bracketed under 'filename'.

`http` => Hypertext Transfer Protocol

HTTP

- The **transfer protocol** is the **set of rules** that the computers use to **move files** from one computer to another on the Internet.
- The most common transfer protocol used on the Internet is the Hypertext Transfer Protocol (HTTP).
- Two other protocols that you can use on the Internet are the File Transfer Protocol (FTP) and the Telnet Protocol.



HTTP://

How to find information
on the Web?

- A number of **search tools** have been developed and available to you on certain Web sites that provide search services to help you find information.
- Examples:
 - Yahoo www.yahoo.com
 - Excite www.excite.com
 - Lycos www.lycos.com
 - AltaVista www/alta-vista.com
 - MSN Web Search www.search.msn.com

- You can find information by two basic means.
- Search **by Topic** and Search **by keywords**.
- Some search services offer both methods, others only one.
- Yahoo offers both.

➤ Search by Topic

You can navigate through topic lists

➤ Search by keywords

You can navigate by entering a keyword or phase into a search text box.

