

Web Application Development

Introduction to the Internet and the WWW

Contents

- History of the Internet
- Some concepts related to the Internet
- Applications on the Internet
- Introduction to the World Wide Web

History of the Internet

- **1945**

Vannevar Bush wrote in *Atlantic Monthly* about a memory extension — **Memex** — which was a photo-electrical-mechanical device that linked documents on microfiche.

- **1958**

In response to the launch of Sputnik, the U.S. Defense Department established Advanced Research Projects Agency (ARPA), which eventually would focus on **computer networking** and **communications technology**.

History of the Internet

- **1962**

Doug Engelbart devised NLS — "**oNLine System**" — for browsing and editing information. In the process, he invented the computer mouse.

- **1965**

Ted Nelson coined the name ***hypertext*** for a complex, changing, indeterminate file structure.

Donald Davies at the UK National Physical Laboratory coined the terms ***packet*** and ***packet switching***.

History of the Internet

- **1969**

ARPA started what would become the Internet when it created **ARPANET** connecting the University of California at Los Angeles (UCLA) with SRI International at Menlo Park, California, and then the University of California at Santa Barbara and the University of Utah.

History of the Internet

- **1971**

File Transfer Protocol (**FTP**) is established.
Fifteen sites were connected to ARPANET.

- **1974**

TCP/IP becomes the Internet Protocol Suite.

The term ***Internet*** was coined to describe a single global TCP/IP network.

History of the Internet

- **1978**

Amateur radio operators began experimenting with packet radio transmitting **ASCII encoded data** over Very High Frequency (**VHF**) amateur radio frequencies using homebuilt equipment.

- **1980**

Tim Berners-Lee, at CERN in Switzerland, wrote a notebook program called **ENQUIRE** — "Enquire-Within-Upon-Everything" — which linked computer information points.

Earlier forms of text messaging become electronic mail, commonly called **email** or e-mail.

History of the Internet

- **1983**

The Domain Name System (**DNS**) is invented.

Generic top-level domain categories are .gov, .edu, .com, .mil, .org and .net.

- **1989**

Tim Berners-Lee at CERN wrote "**Information Management: A Proposal**" and "HyperText and CERN." He proposed what was to become the World Wide Web.

History of the Internet

- **1990**

Tim Berners-Lee invented the **World Wide Web**, HTML, and a **text browser**. He used a NeXT computer to write a global hypertext system and create a hypertext graphical user interface (GUI) browser and "what you see is what you get" editor.

He established the first successful communication between an Hypertext Transfer Protocol (HTTP) client and server via the Internet.

History of the Internet

- **1993**

Marc Andreessen, Eric Bina and others at NCSA displayed first **graphical browser, Mosaic**. Other browsers were Midas, Erwise, Viola and one for Mac.

- **1994**

Two million computers connected to the Internet were used mostly by academics, scientists, and corporate researchers.

History of the Internet

- **1995**

Amazon.com bookstore appears.

Sergey Brin and Larry Page planned the **future Google**.

The **first wiki** was written.

History of the Internet

- **1996**

Microsoft Internet Explorer appeared.

Hotmail was the first Web e-mail site.

- **1998**

Netscape released its code, spawning **Mozilla open-source browser**.

Google opened and answered 10,000 search queries per day.

History of the Internet

- **2001**

Wikipedia opened.

Google answered more than 100 million searches per day.

Apple released the first iPod.

The file-sharing service Kazaa founded.

History of the Internet

- **2003**

More than **three billion** Web pages.

New browsers include Apple Computer's Safari and others including Amaya, Camino, Lynx, Opera and Phoenix.

The virtual world **Second Life** was born.

WordPress blog publishing and content management system opens.

Skype voice calling over the Internet begins.

Apple introduces the on-line music service **iTunes**.

History of the Internet

- **2004**

Newest browser is **Firefox** by Mozilla. Apple Computer's iPod pocket-sized MP3 music player are all the rage.

Facebook started collecting friends.

Podcasting commenced.

Flickr image hosting website opens.

Digg was founded.

Mass use of Voice over Internet Protocol – **VoIP** – begins.

History of the Internet

- **2005**

More than **eight billion** Web pages.

Online technology is in two-thirds of American homes. Three-quarters of Americans go online spending an average 12.5 hours there per week. Television viewing declines among Internet users.

High-speed always-on broadband access to the Internet is changing dramatically how we related to the Web – how often we go online, what we do online, how long we stay online.

YouTube began storing and retrieving videos.

Google Earth is a virtual globe, map and geographical Internet site.

History of the Internet

- **2006**

Twitter began issuing tweets.

Google has indexed more than 25 billion web pages, 400 million queries per day, 1.3 billion images.

History of the Internet

- **2007**

Apple released the iPhone multimedia and Internet smartphone.

- **2008**

Google released the Chrome web browser.

- **2009**

It's estimated that **a quarter of Earth's population** uses the Internet.

Microsoft's Bing joins Yahoo and Google as major search engines on the Internet.

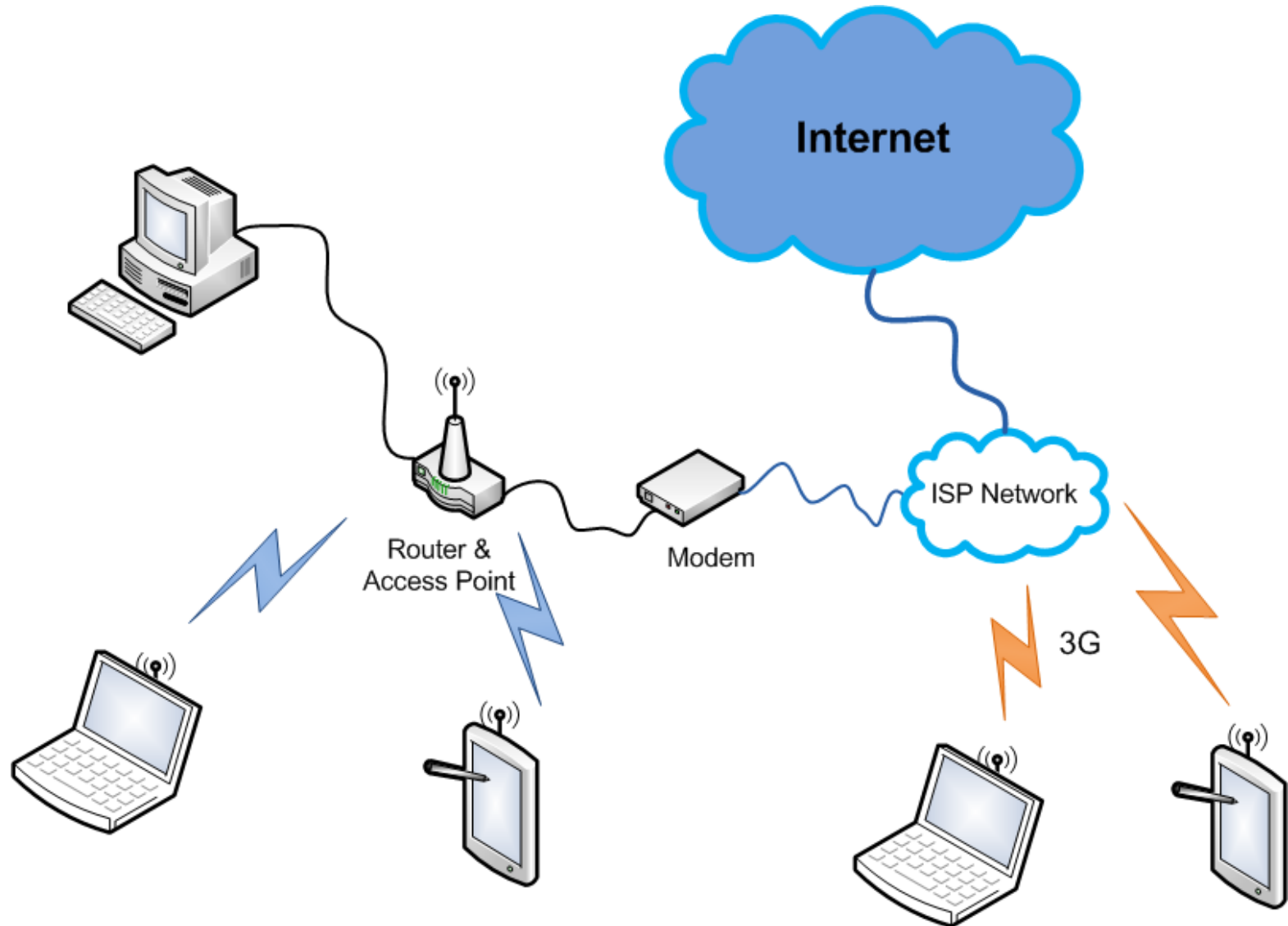
- **2010**

Apple released the iPad tablet computer.

- **2014**

HTML5

Connecting to the Internet



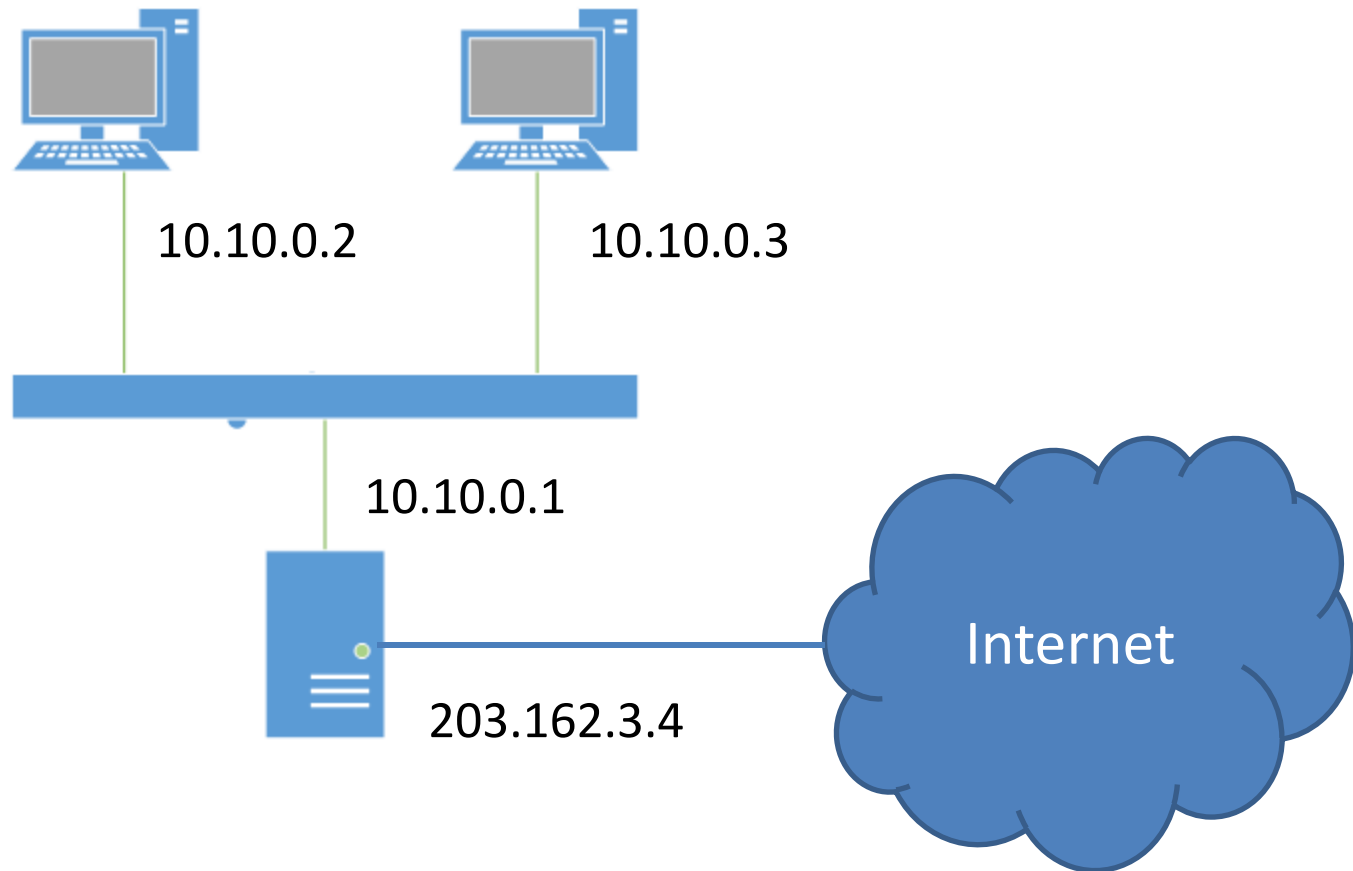
TCP/IP

- Protocol: defines formats and rules for exchanging messages between parties
- TCP/IP protocols: a set of protocols used for the Internet; two most important protocols are IP and TCP

TCP/IP

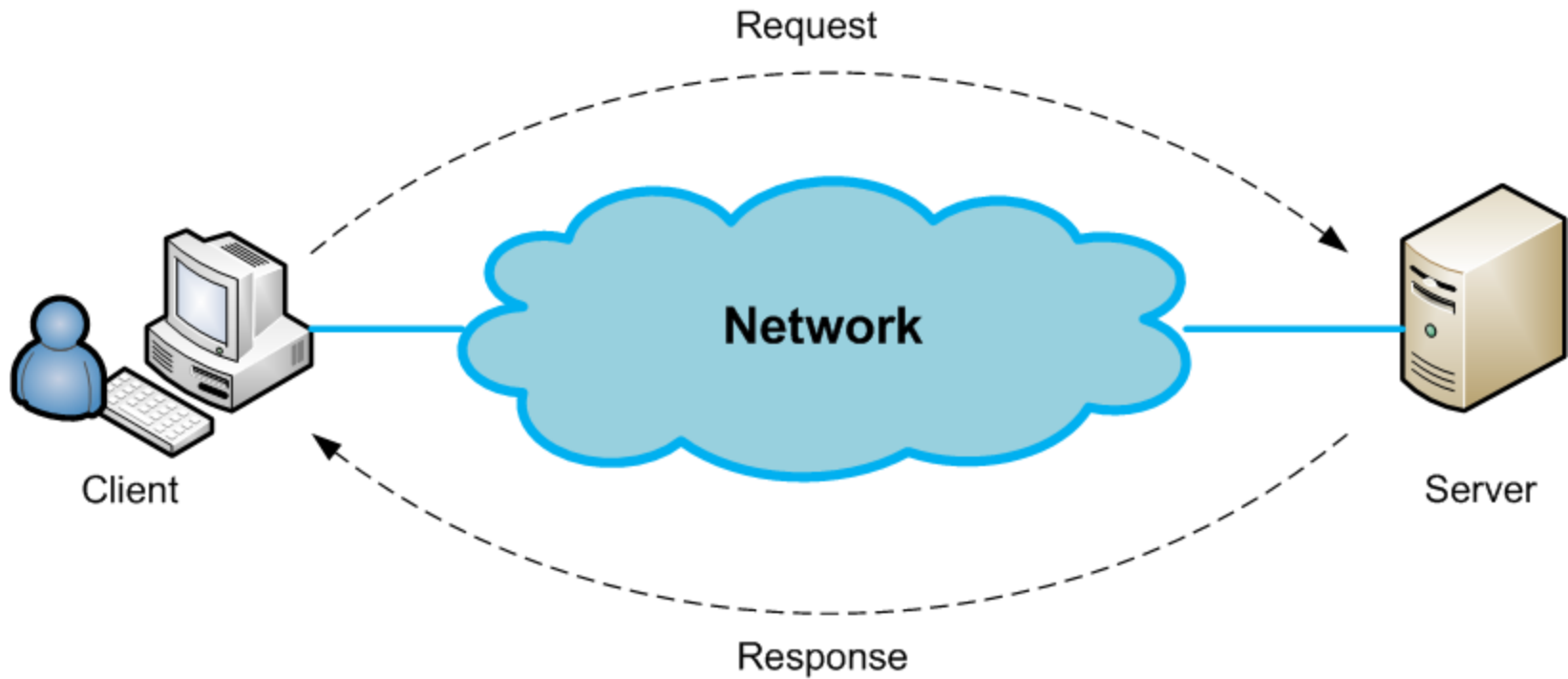
- IP address: numerical addresses of devices on the Internet;
 - example: 42.112.24.18 (USTH), 74.125.239.31 (Google VN)
- Virtual vs. real IP address

Virtual vs. real IP address



Some Concepts

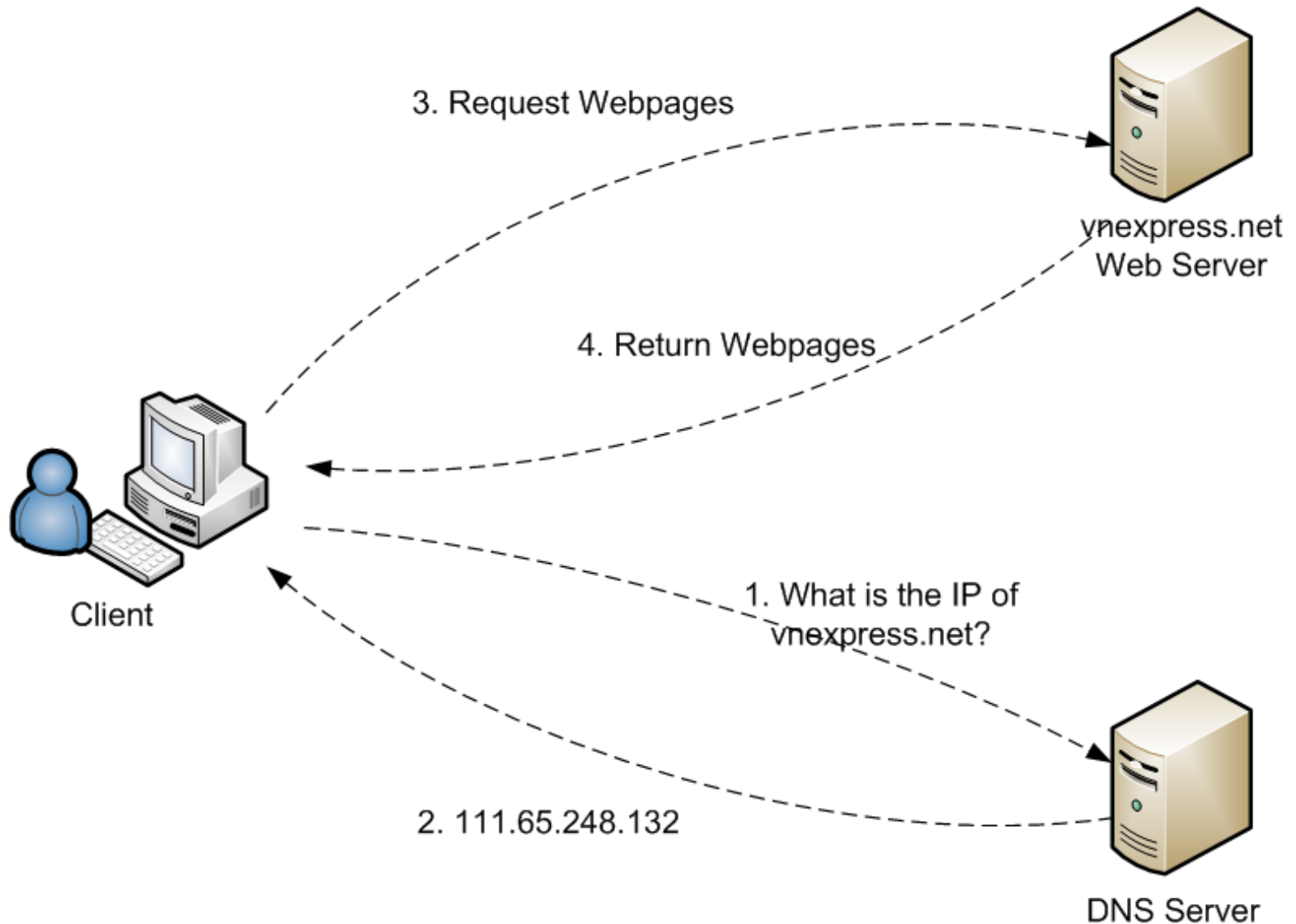
Client – Server Systems



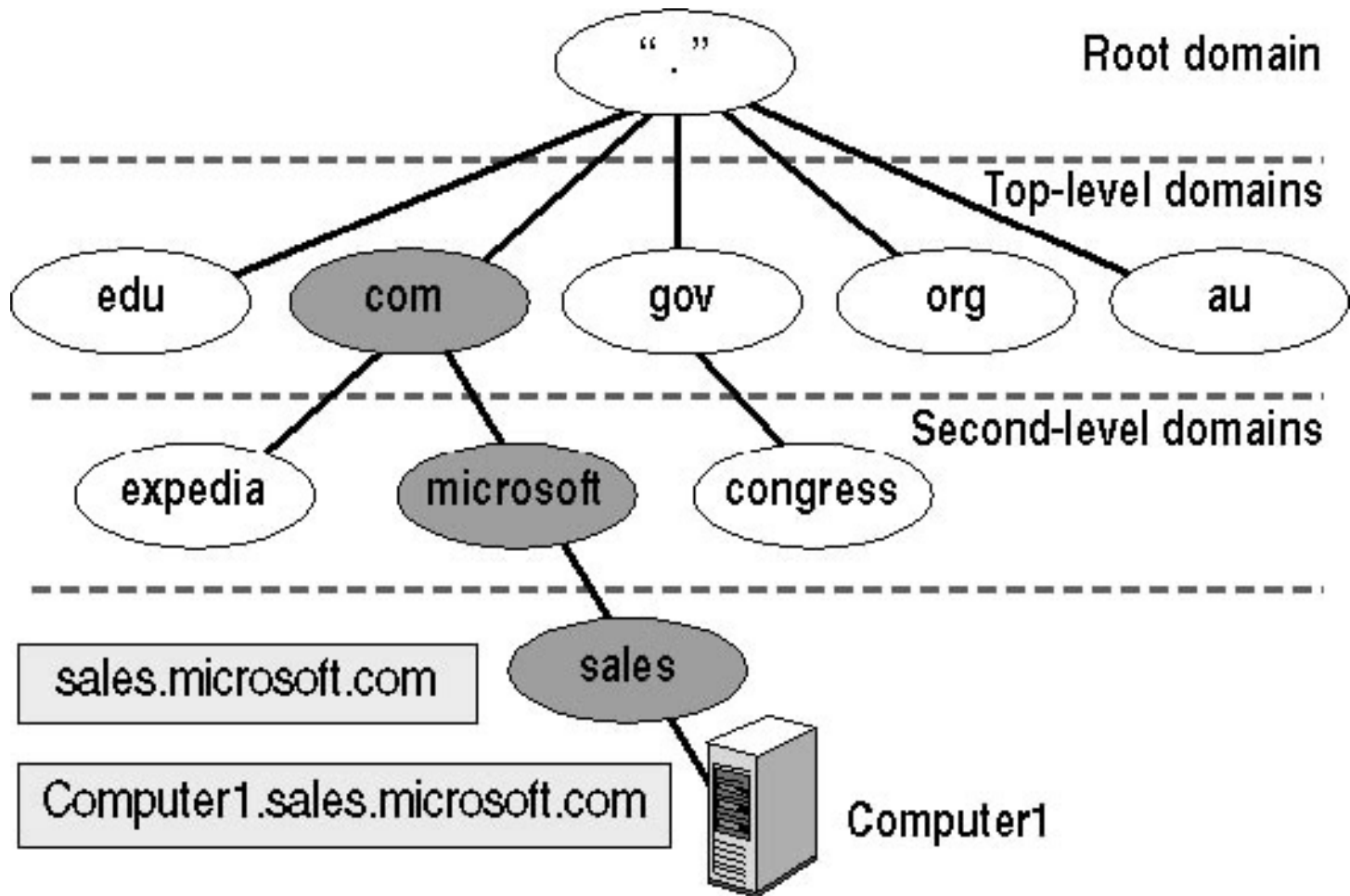
Some Concepts

- Domain name: memorable names for nodes on the Internet (instead of using IP address)
 - Example: 111.65.248.132 \Leftrightarrow vnexpress.net
- Domain name server: the server helps to map IP addresses to domain names (and vice versa)

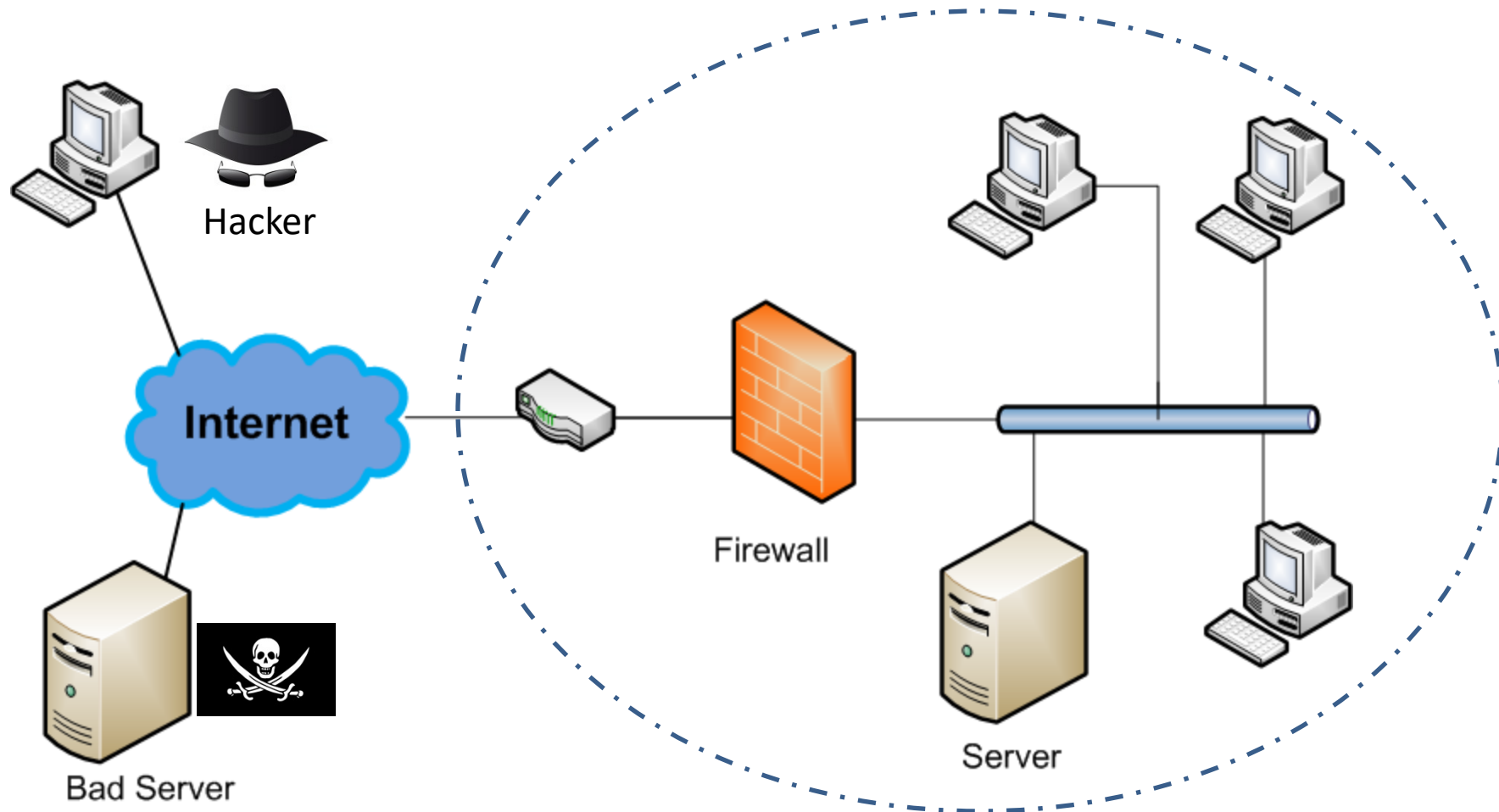
DNS Server



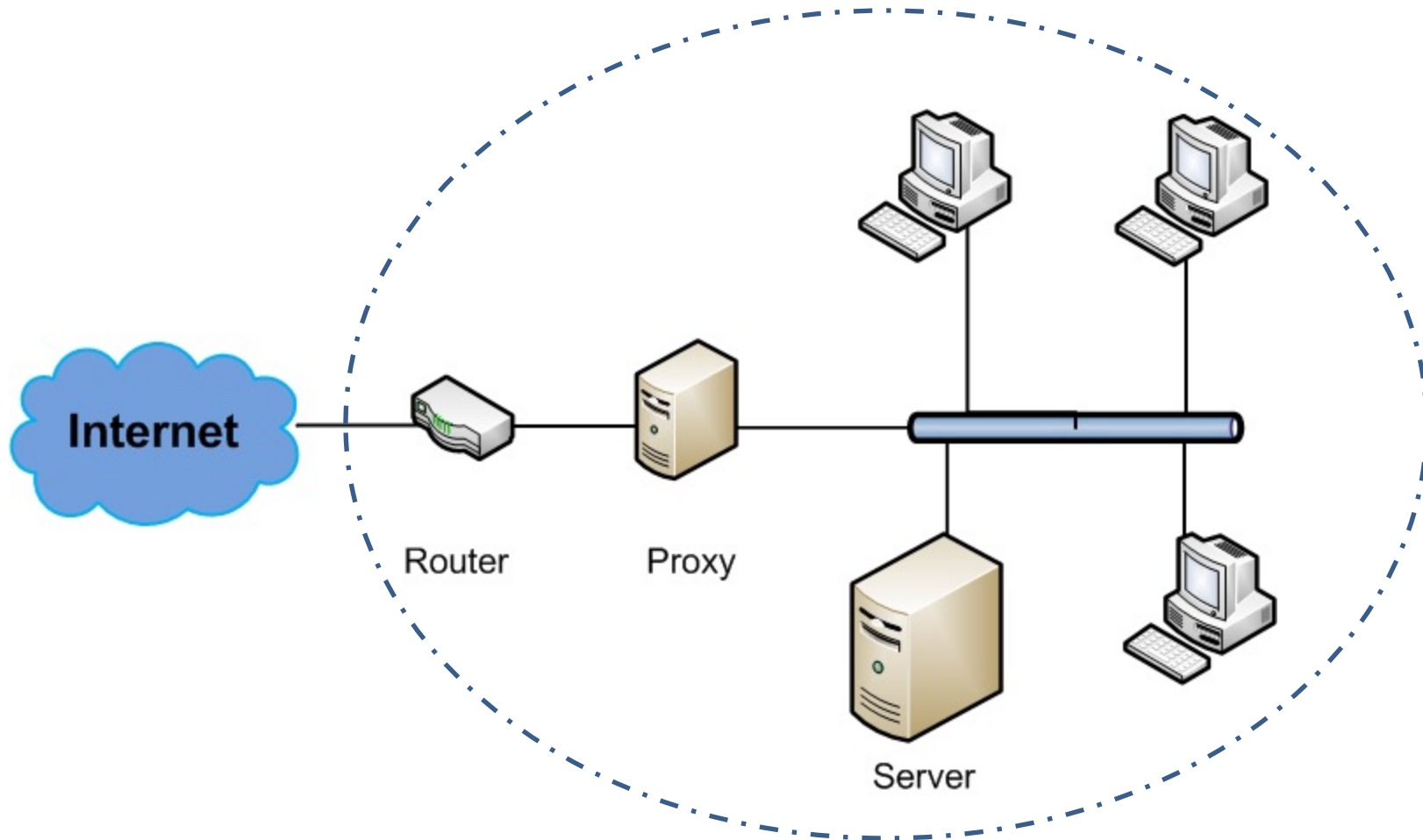
DNS



Firewall



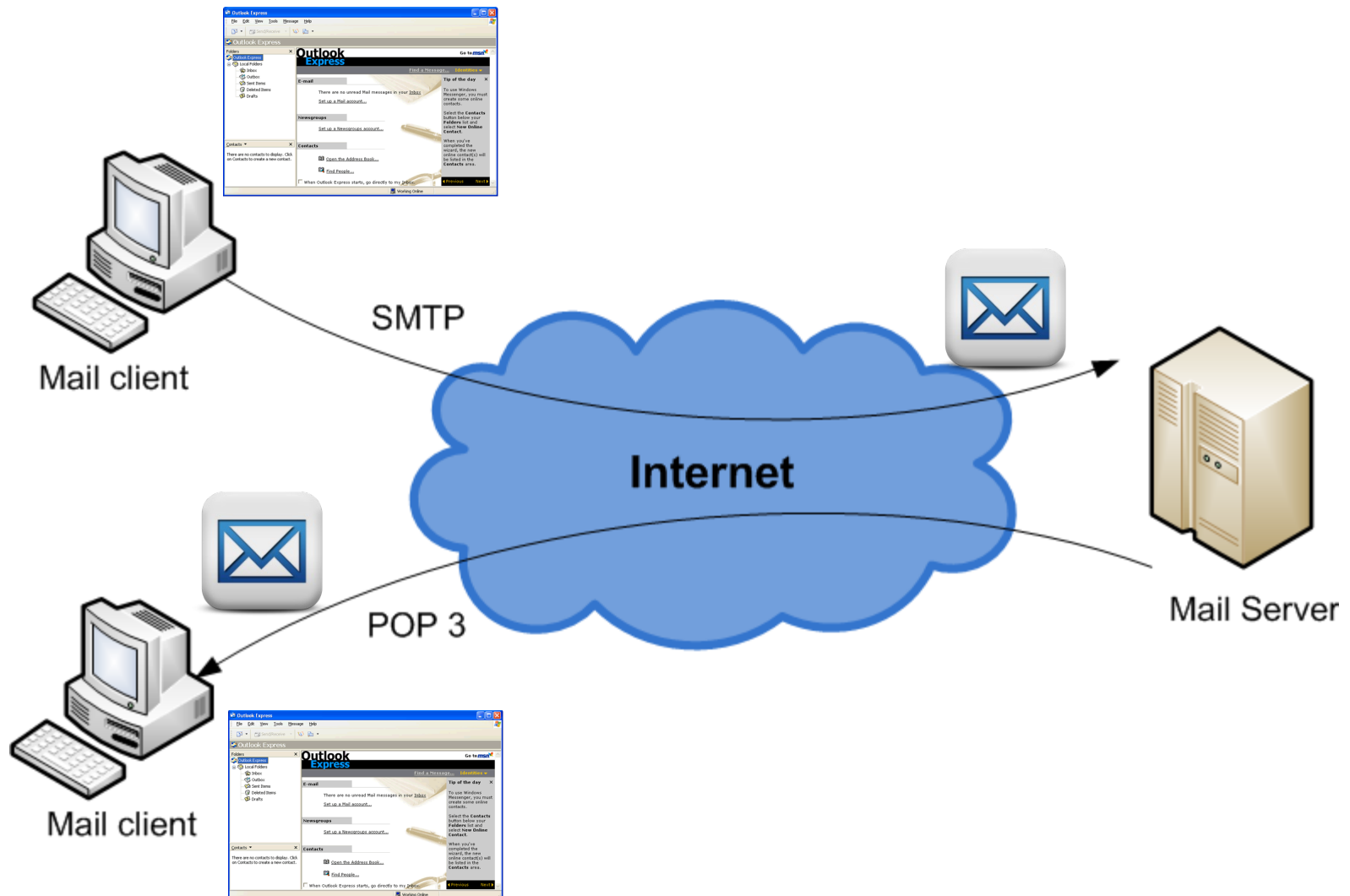
Proxy



Applications on the Internet

- Electronic mail (email)
- File server
- Web
- Instant messaging
- Video conferencing
- Social network
- P2P
- Media/file sharing

Email



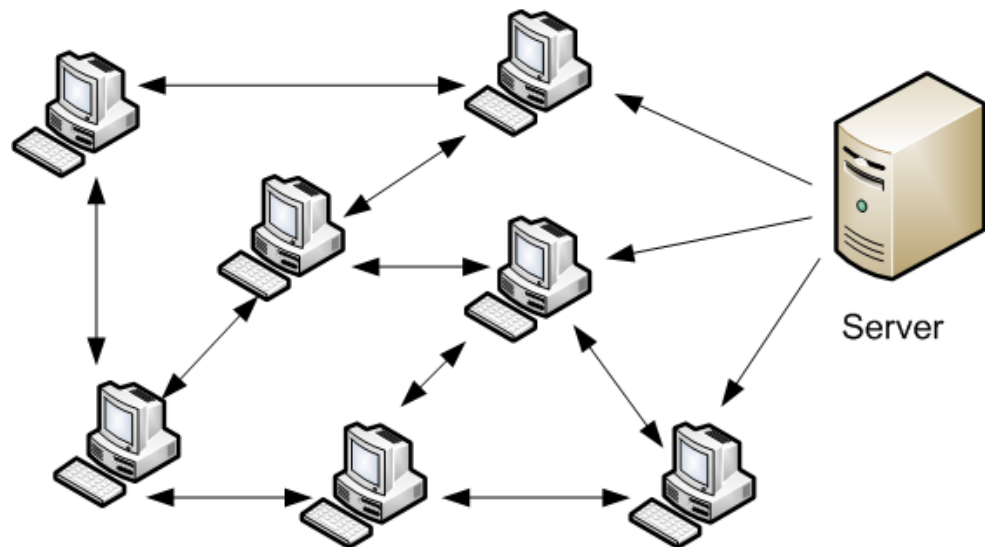
Instant Messaging



Video Conferencing



P2P



File Sharing



Google Drive

Media Sharing



Instagram



Social Networks

The Facebook logo, consisting of the word "facebook" in white lowercase letters on a dark blue rectangular background.

facebook®

The Twitter logo, featuring the word "twitter" in light blue lowercase letters followed by a light blue bird icon (the Twitter bird) facing right.

twitter

Introduction to the WWW

- The World Wide Web is a worldwide collection of electronic documents (a.k.a the Web)
- A Web page is a document on the WWW
- A Web site is a collection of related Web pages

Introduction to the WWW



Introduction to the WWW

- Protocol: HyperText Transfer Protocol (HTTP)
request

```
GET /path/file.html HTTP/1.0  
From: someuser@jmarshall.com  
User-Agent: HTTPTool/1.0 [blank line here]
```

response

```
HTTP/1.0 200 OK  
Date: Fri, 31 Dec 1999 23:59:59 GMT  
Content-Type: text/html  
Content-Length: 1354  
<html> <body> <h1>Happy New Millennium!</h1> (more  
file contents) . . . </body> </html>
```

- Language used to create Web pages: HyperText Markup Language (HTML)

HTTP vs HTML

- HTML: hypertext markup language
 - Definitions of tags that are added to Web documents to control their appearance
- HTTP: hypertext transfer protocol
 - The rules governing the conversation between a Web client and a Web server

Both were invented at the same time by the same person

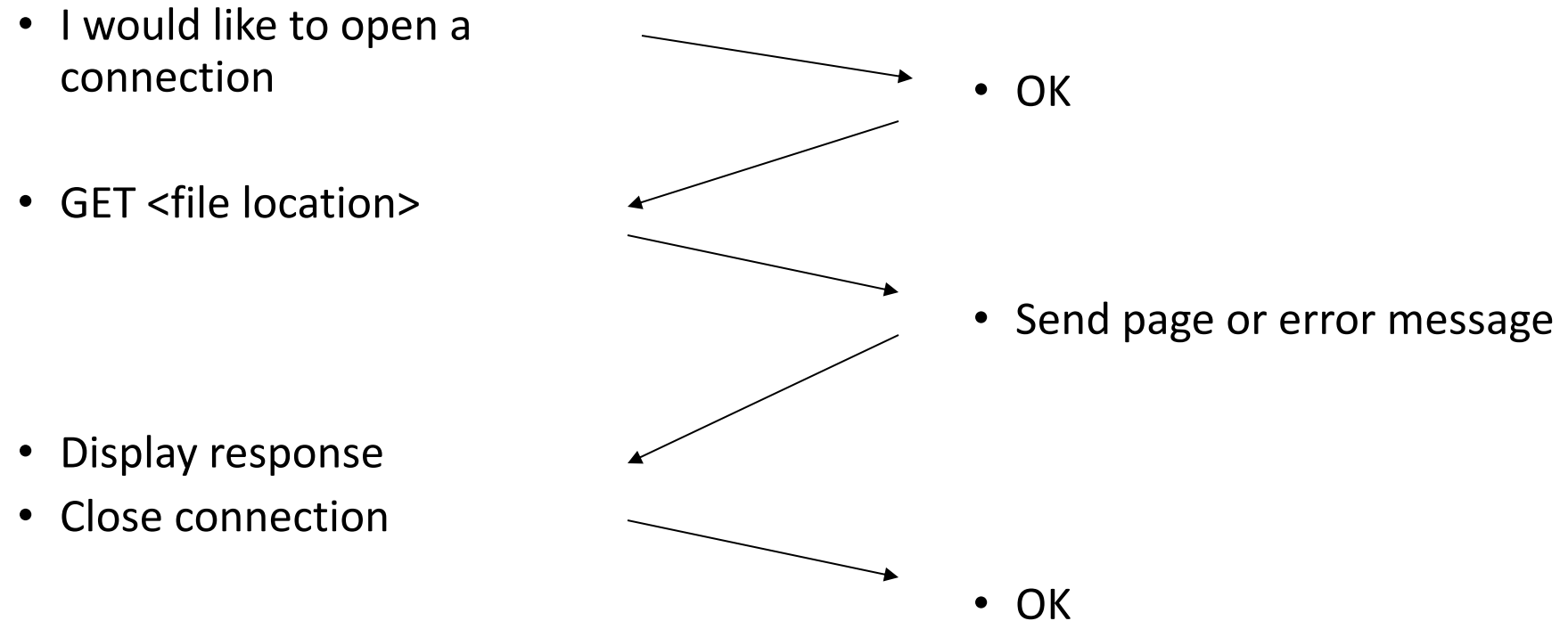
What is a protocol?

- In diplomatic circles, a protocol is the set of rules governing a conversation between people
- We have seen that the client and server carry on a machine-to-machine conversation
- A network protocol is the set of rules governing a conversation between a client and a server
- There are many protocols, HTTP is just one

An HTTP conversation

Client

Server



HTTP is the set of rules governing the format and content of the conversation between a Web client and server

An HTTP example

- The message requesting a Web page must begin with the word “GET” and be followed by a space and the location of a file on the server, like this:

`GET /fac/lpress/shortbio.htm`

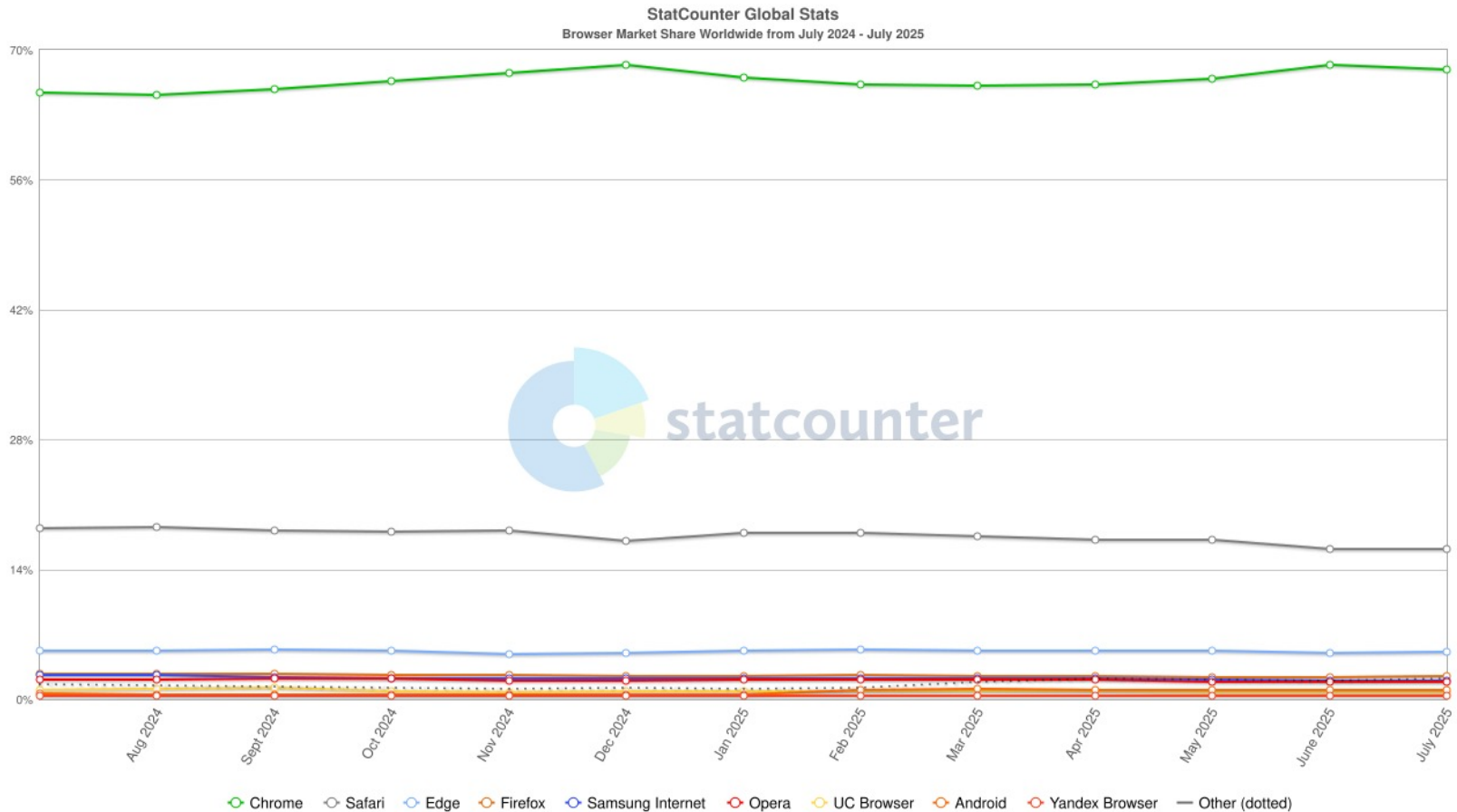
The protocol spells out the exact message format, so any Web client can retrieve pages from any Web server.

Web Client

- Usually mentioned as Web browser
 - Firefox
 - Internet Explorer
 - Chrome

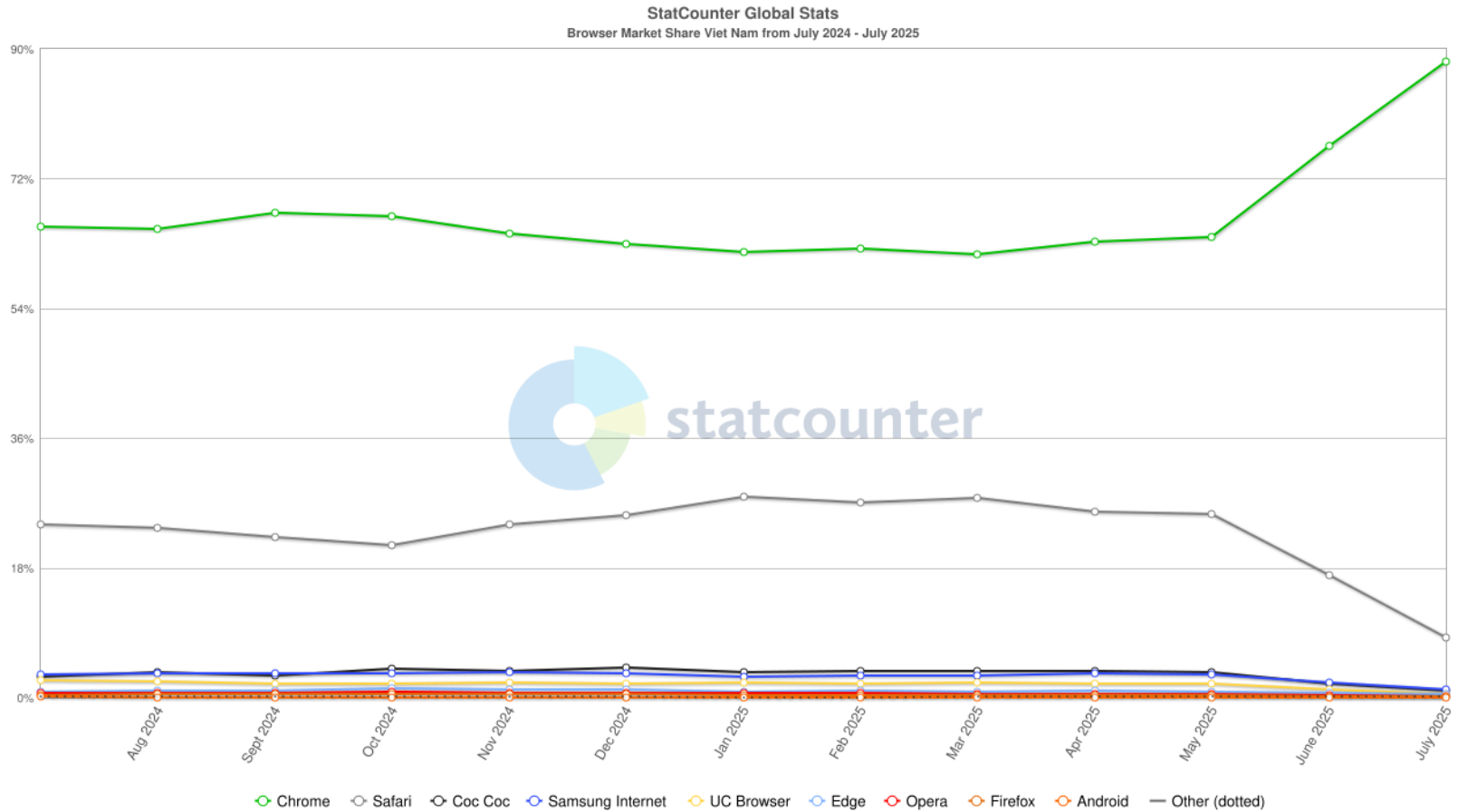


Web browsers



(source: StatCounter)

Web browsers



(source: StatCounter)

Web Server

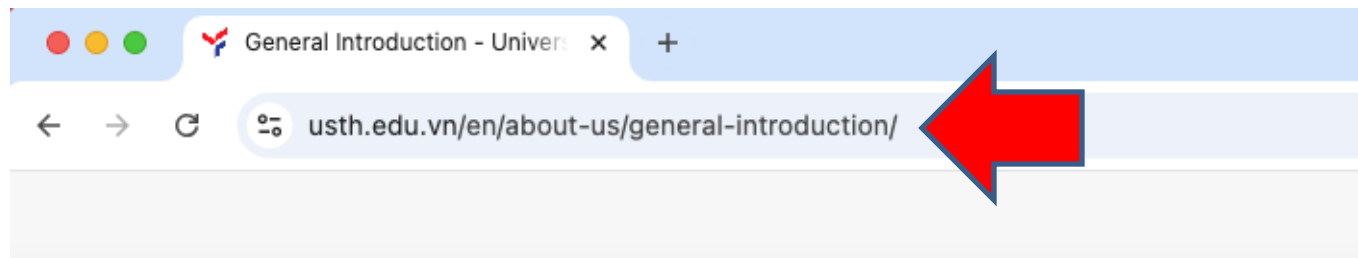


Popular servers

- Apache HTTP server
- Internet Information Service (IIS)
- lighttpd

Some Concepts

URL (Uniform Resource Locator): a string representing the location of a Web page



Introduction

Training

QA & Examination

General Introduction



Some Concepts

- Home page: the Web page considered as the “start point” for a Web site
- Hyperlink: the pointer from a Web page to another

News



Admissions announcement for master's program in...

The Master's Program in Applied Mathematics at the University of Science and Technology of Hanoi (USTH) has been ...

✓ read more



USTH signs MoU with USTH Consortium



A French Intern at USTH: An unexpected love for salted coffee and a passion for clean energy



A Tribute to Dr. Yannick Giraud-Héraud, former Director of the Department of Space and Applications, USTH

✓ See all

Events



8
19

Seminar "Rethinking Robotic Intelligence: From More Control to Better Design"

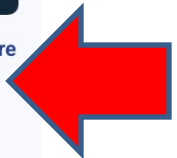
May
18

Postgraduate Day 2025: Unlock your future with global-class education

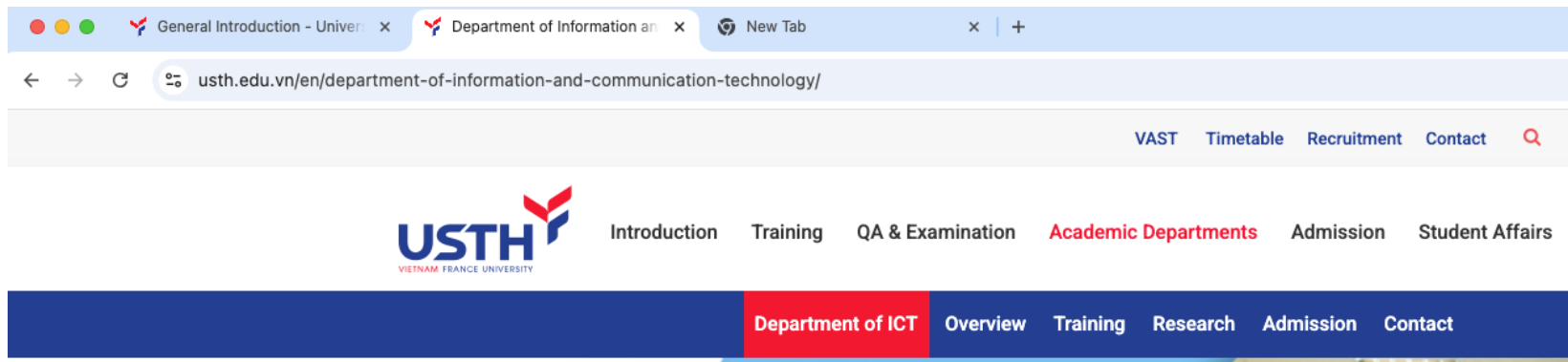
February
21

Seminar: "Chemistry for Advanced Materials"

✓ See all



Tab Browsing



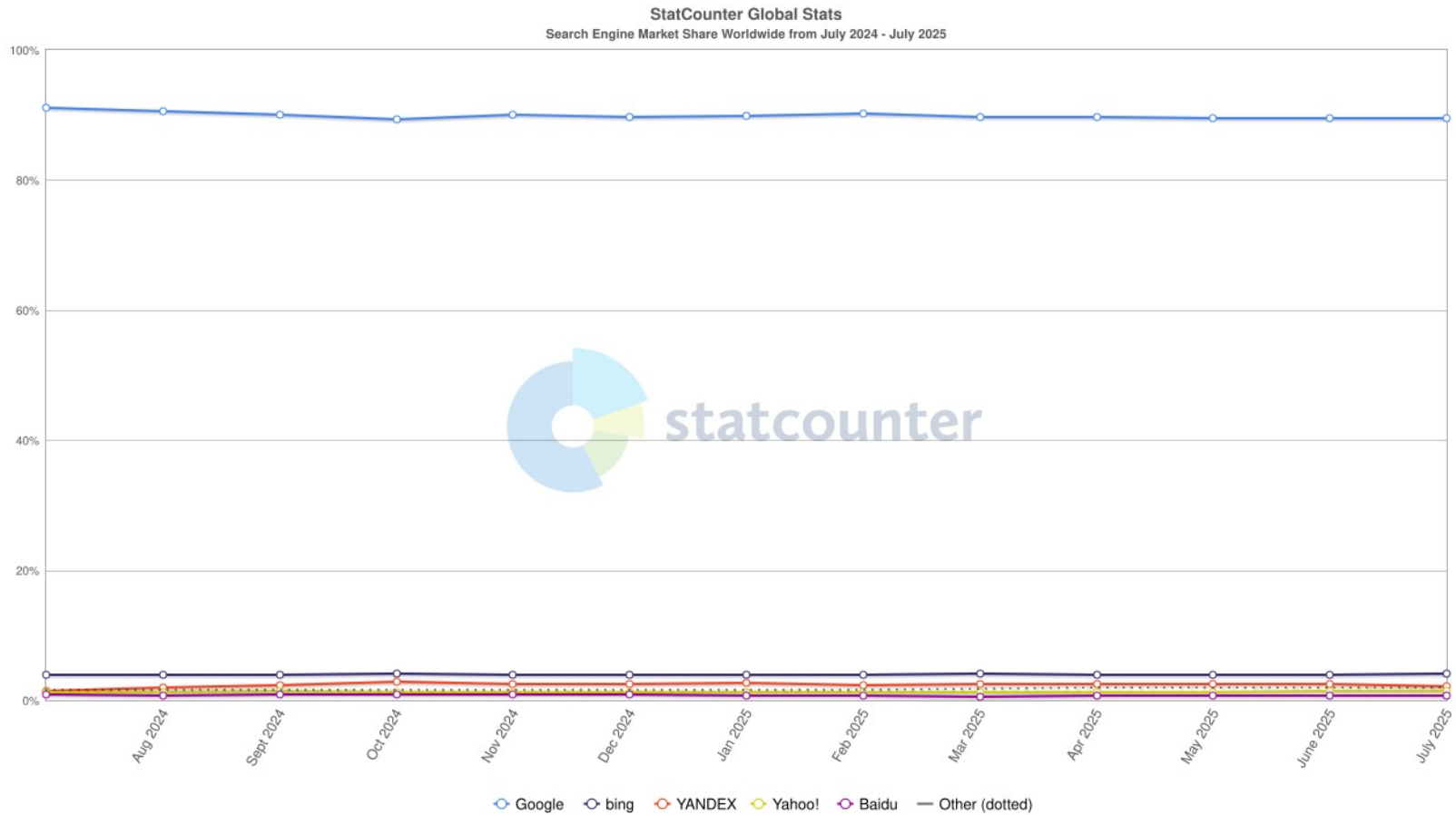
Web Multimedia

- Audio
- Video
- Animation
- 3D

Search Engines

- A search engine is a system designed to search information on the WWW
- Popular search engines
 - Yahoo! (<http://www.yahoo.com>)
 - Bing (<http://www.bing.com>)
 - Google (<http://www.google.com>)
 - Coccoc (<http://coccoc.com>)











Search Engines



(source: StatCounter)











Top Sites

Most Visited Websites in the World, Updated July 2025

Position	Website	Change	Visits	Pages / Visit	Bounce rate
1	 google.com	–	101,348,173,032	5.3	37.6%
2	 youtube.com	–	47,122,481,920	8.69	31.55%
3	 facebook.com	–	9,943,581,521	7.29	48.75%
4	 instagram.com	–	5,708,807,142	8.66	51.41%
5	 chatgpt.com	–	5,244,855,278	4.23	41.67%
6	 wikipedia.org	↑ 1	4,763,296,955	3.03	58.83%
7	 reddit.com	↓ 1	4,656,570,719	3.53	59.99%
8	 x.com	–	3,961,040,983	8.22	48.88%
9	 yahoo.com	–	3,832,539,122	3.58	50.49%
10	 whatsapp.com	↑ 1	2,823,170,747	5.9	60.29%

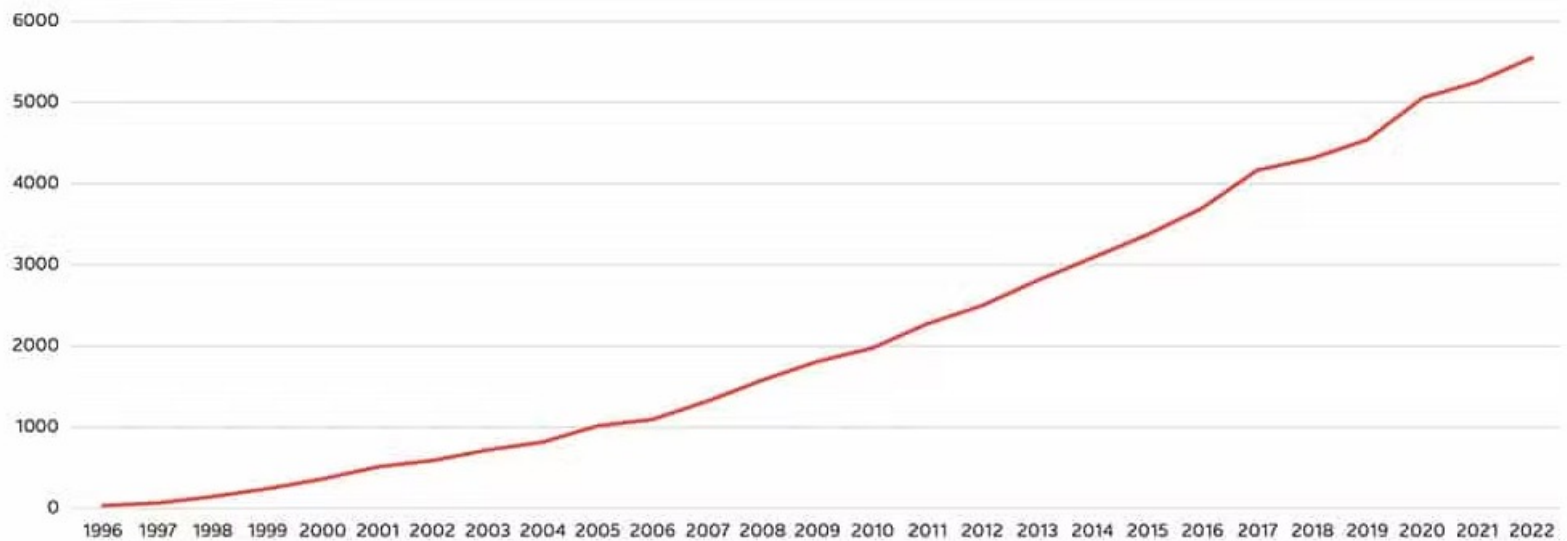
Top Sites

Most Visited Websites in Vietnam, Updated July 2025

Position	Website	Change	Visits	Pages / Visit	Bounce rate
1	 google.com	–	1,343,988,840	6.34	33.71%
2	 youtube.com	–	615,177,170	9.16	28.54%
3	 facebook.com	–	316,874,917	12.12	34.24%
4	 chatgpt.com	–	120,595,836	4.0	33.28%
5	 vnexpress.net	–	106,729,848	2.73	45.13%
6	 yahoo.com	↑ 3	74,244,605	2.21	57.76%
7	 shopee.vn	↑ 1	73,950,379	4.56	55.92%
8	 search.yahoo.com	↑ 2	72,403,160	2.13	58.23%
9	 zalo.me	↓ 3	66,220,053	3.43	68.39%
10	 searchingcoffee.com	–	55,034,733	1.26	81.71%

Growth of the Internet

Million Internet users from 1995 to 2022



Web 2.0

- Web 1.0: users access contents
- Web 2.0: users create, organize, remix contents
- Websites
 - Search
 - User-generated content
 - Blogging
 - Social network
 - Social media
 - Location-based services

Mobile Web

- Websites for mobile devices
- Considerations
 - Screen
 - Computation power
 - Connection



Summary

- History of the Internet
- Some concepts related to the Internet
- Applications on the Internet
- Introduction to the World Wide Web
- Web browsers

