Internet - 204100

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Overview

- Computer Network

- Internet

- TCP/IP

- Domain Names

- Internet Services

Computer Network

- Telecommunication network that allows computers to exchange data.

- The physical connection established using either cable media or wireless media.

- The best-known computer network is the Internet.

Computer Network

Pros

- Facilitates interpersonal communications

- Allows sharing of files, data, and other types of information

- Allows sharing of network and computing resources

Cons

- May be insecure

- May interfere with other technologies

- May be difficult to set up

Computer Network

- Computer network types by spatial scope

  - LAN (Local Area Network) – limited area such as a home, school, computer laboratory, or office building

  - MAN (Metropolitan Area Network) –geographically separated but in same metropolitan city (5-40km)

  - WAN (Wide Area Network) – across metropolitan, regional, or national boundaries -- WWAN

Internet

- The Internet is a global system of interconnected computer networks.

- Uses the standard Internet protocol suite (TCP/IP) to serve several billion users worldwide

- Communications protocol is a system of digital rules for message exchange within or between computers.

- https://www.youtube.com/watch?v=Dxcc6ycZ73M

- https://www.youtube.com/watch?v=ZhEf7e4kopM

video source: code.org

History of Internet

- The public was first introduced to the concepts with ARPANET (Advanced Research Projects Agency NETwork) within the U.S. Department of Defense in 1969

ARPANET LOGICAL MAP, MARCH 1977

O IMP   △ PLURIBUS IMP
□ TIP   ∿ SATELLITE CIRCUIT
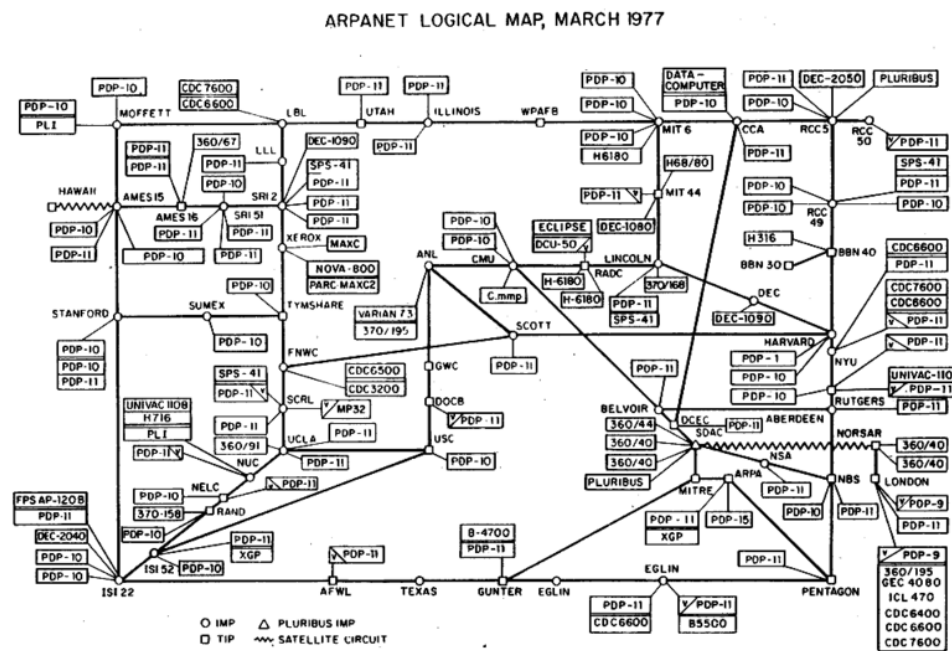
(PLEASE NOTE THAT WHILE THIS MAP SHOWS THE HOST POPULATION OF THE NETWORK ACCORDING TO THE BEST INFORMATION OBTAINABLE, NO CLAIM CAN BE MADE FOR ITS ACCURACY)

NAMES SHOWN ARE IMP NAMES, NOT (NECESSARILY) HOST NAMES

Internet in Thailand

- Thailand obtained internet access in 1996 as the third country in South East Asia.

- About 8.6 million people use the internet every day in Thailand, according to Google Thailand's 2012 figures

- 24 million people have regular access, representing over one-third the population

TCP/IP

- Main protocol for the Internet

- https://www.youtube.com/watch?v=AYdF7b3nMto

- Consists of

  ○ TCP (Transmission Control Protocol)

    • Breaks data down into packets

    • Combined received packets back into usable data

    • Error Checking/ Request for Resending

  ○ IP (Internet Protocol)

    • Use IP address to relay datagram across networks

    • Decide/Change datagram path (Routing)

video source: code.org

Internet Protocol

- The Internet Protocol (IP) is the principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries.

IP Address

- IP address (Internet Protocol address) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network.

- Originally defined as a 32-bit number and this system, known as Internet Protocol Version 4 (IPv4)

- Newer system called IPv6 but the term IP address typically still refers to the addresses defined by IPv4.

IP(v4) Address

- Consists of four decimal numbers (one byte each), each ranging from 0 to 255 (1 byte = 8 bit -> 2^8 = 256) separated by dots. For example 172.16.254.1

Public vs Private IP

- **Public IP**

  ○ Can be referenced across networks

  ○ Managed/Assigned by governing organizations

    • Network Information Center (NIC)

    • Internet Assigned Numbers Authority (IANA)

- **Private IP**

  ○ Within LAN

  ○ Managed by system administrators

Checking IP Address

Windows

- Open terminal

  ○ Press +

  ○ You will get run command windows

  ○ Type in cmd.exe
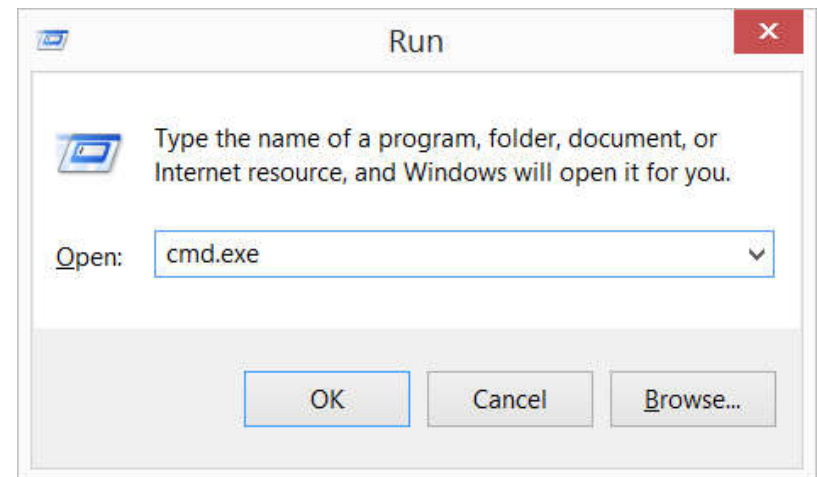
Checking IP Address [2]

- You will terminal

- Enter ipconfig

```
>ipconfig
```

- You will get the following:

```
Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::d858:5a39:d8f0:f781%3
    IPv4 Address. . . . . . . . . . . : 172.16.0.143
    Subnet Mask . . . . . . . . . . . : 255.255.255.0
    Default Gateway . . . . . . . . . : 172.16.0.254
```

Domain Name

- Provides recognizable and memorizable names to numerically addressed Internet resources (IP address)

- Translated by Domain Name System (DNS) server to IP address (Name Resolution)

  ○ This is called DNS lookup

- https://www.youtube.com/watch?v=5o8CwafCxnU

Domain Name →	DNS Server	IP address →

www.cs.science.cmu.ac.th · 202.28.248.60

video source: code.org
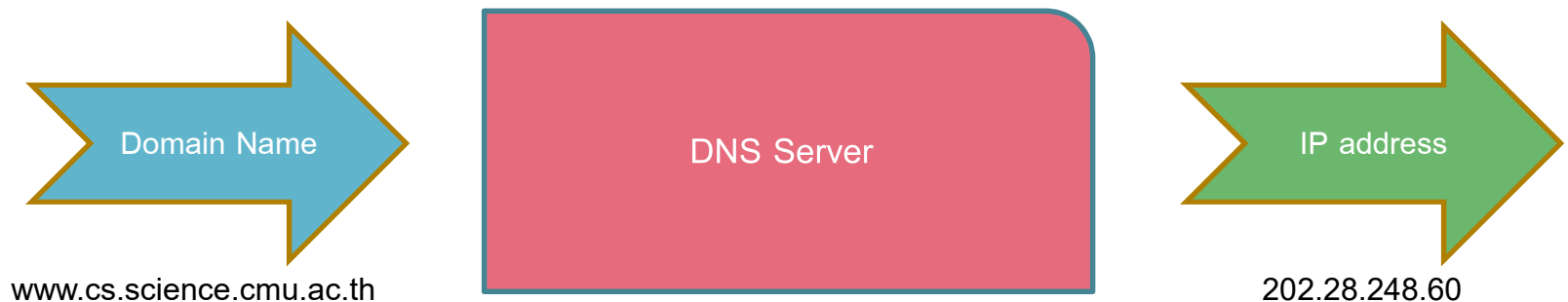
Top Level of Domain Name

- **Rightmost Section**

- Can be:

  - Entity Type

    - .com, .gov, .mil, etc.

  - Country Code

    - .th, .jp, .uk, .cn, .mm

TLD	Intended Use (Original)
.com	Commercial
.net	Network Infrastructure
.org	Organization
.gov	Government (US)
.edu	Educational Organization
.mil	Military (US)
.int	International Organization (Treaty)
.biz	Business
.info	Informational Site

Lower Levels of Domain Name

- **Second-level Domain**

  - Subdomain of TLD

    - .go.th,   .ac.uk

  - Not Subdomain of TLD

    - www.google.com

- **Other Subdomains**

  - www.cs.science.cmu.ac.th

- **The leftmost characters (like 'www') indicate <u>service</u>.**

Bandwidth vs. Latency

- Bandwidth

  - Amount of data that can be transfer during a second

  - Usually measure in (kilo, mega)bytes/second

  - Affect how long it takes to download a file

- Latency

  - Measure delay (seconds)

  - Time it takes for data to reach you

  - Affect real-time communication/ online gaming

Services on the Internet

- E-mail

- WWW

- FTP, sFTP

- Telnet, ssh

- Web search engine

- Conversation

- Social Media

- Web Application

E-mail

- A method of exchanging digital messages from an author to one or more recipients.

- An email address identifies an email box to which email messages are delivered

E-mail Client

- is a computer program used to access and manage a user's email.

- Popular email clients application include Microsoft Outlook, Mozilla's Thunderbird, Apple Inc.'s Mail.

- Popular web-based email clients include: Gmail, Yahoo! Mail, mail.com, Lycos mail, and Outlook.com.

E-mail for CMU students

- The university mail server for student can be accessed at http://portal.cmu.ac.th then click *Student Email*

- Type in your e-mail address and password.

- You'll be taken to Office 365 page.

- Then select *Mail*.
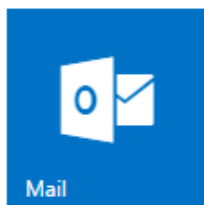
E-mail addresses for new students from the academic year of 2015 on is firstname_l@cmu.ac.th

Send   Discard   Attach   Add-ins   •••

To:

Cc:

Subject:

B   I   U   Aa   A   ab   A   ⋮≡   ⋮≡   ⋮≡   ⋮≡   ⌄

To	**The message's primary recipient(s)**
Cc	**The receiver of a copy of a message addressed primarily to other recipient(s)**
Bcc	**addresses added to delivery list but remaining invisible to other recipients.**
Subject	**A brief summary of the topic of the message**

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WWW

- A system of interlinked documents accessed via the Internet with a web browser.

- Data are held at web server

- Web pages may contain text, images, videos, and other multimedia.

- Navigation via hyperlinks.

- Pages are accessed using Web Address

The Browser War ー Desktop Version
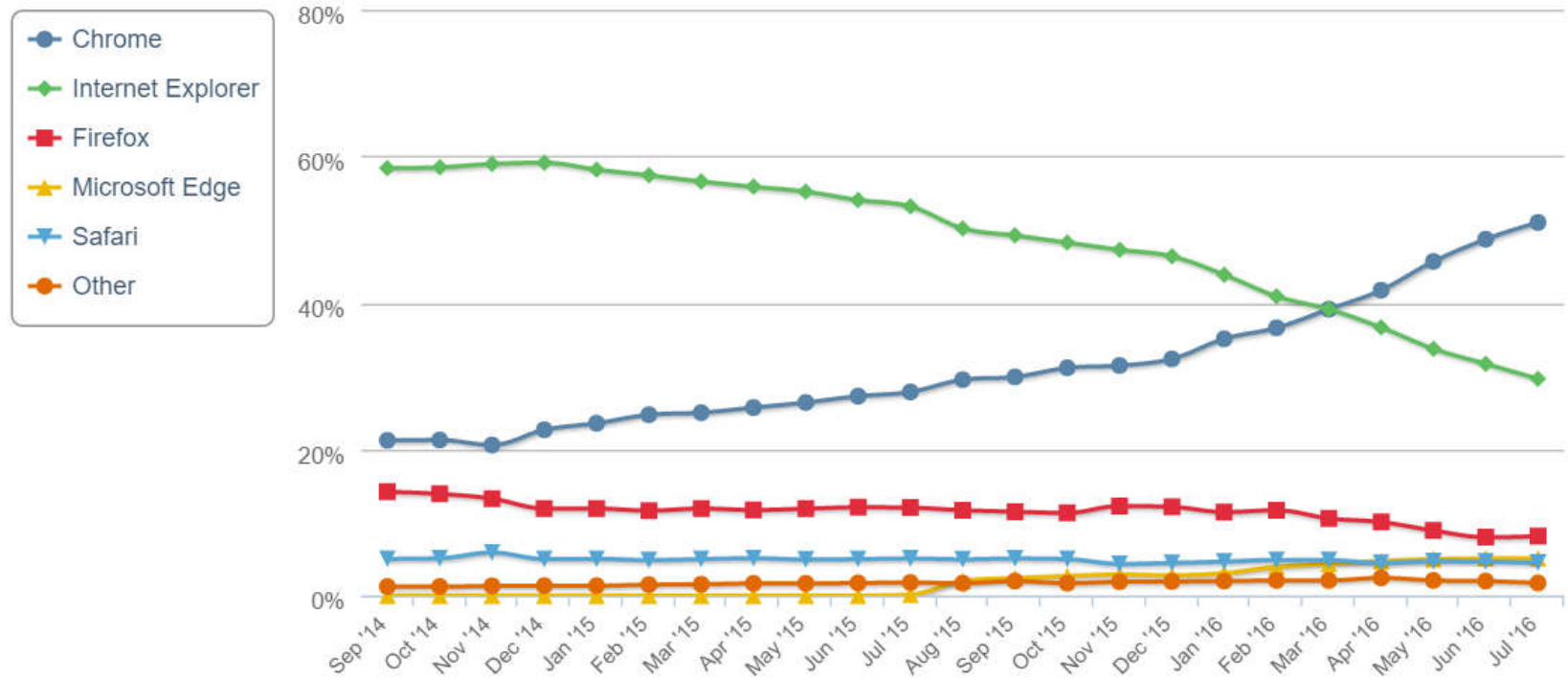
September, 2014 to July, 2016. Source: netmarketshare.com

The Browser War 一 Mobile Version
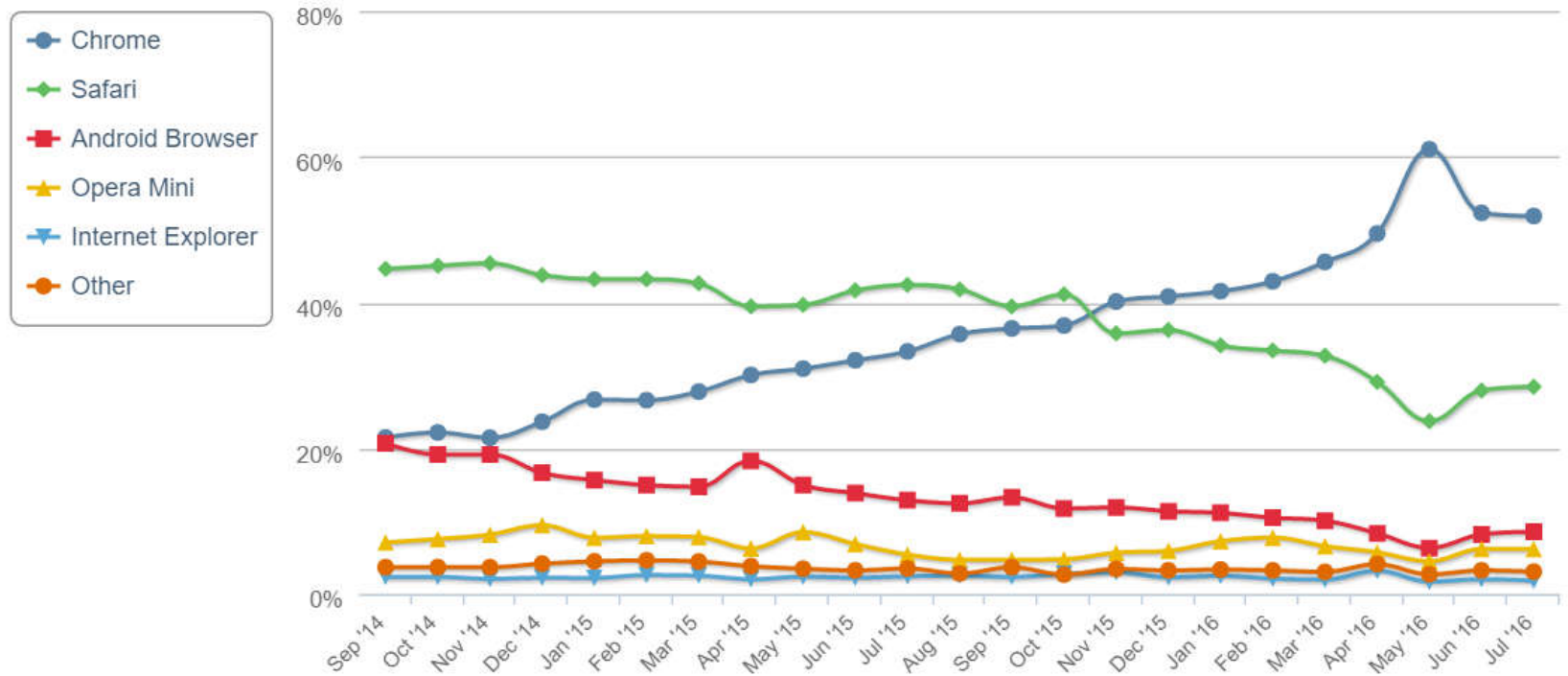
September, 2014 to July, 2016. Source: netmarketshare.com

URL

- A **uniform resource locator**, abbreviated URL, also known as web address

- In most web browsers, the URL of a web page is displayed on top inside an address bar

- The format is protocol://domain/path/file e.g.

  http://www.cs.science.cmu.ac.th/matinee/picture/mypic.jpg

Some Terminology

- Web Page

  ○ Document file used to display information

  ○ Contains text, images, sound, etc.

- Website

  ○ Series of web pages hosted on a single domain

- Home Page

  ○ Default page of a website

More Terminology

- **Web Hosting**

  - Host website on server, making it available on the WWW

- **Internet Service Provider (ISP)**

  - Provide access to the Internet

  - 3BB, AIS, TrueNet, ToT

WWW Protocol

- http://   HyperText Transfer Protocol

- ftp://   File transfer Protocol

- news://   UseNet News group

- gopher://   gopher   (160 servers

            worldwide)

Static vs Dynamic Webpage

- A static web page is a web page that is delivered to the user exactly as stored, in contrast to dynamic web pages which are generated by a web application.

- Static Web Page
  - Just HTML
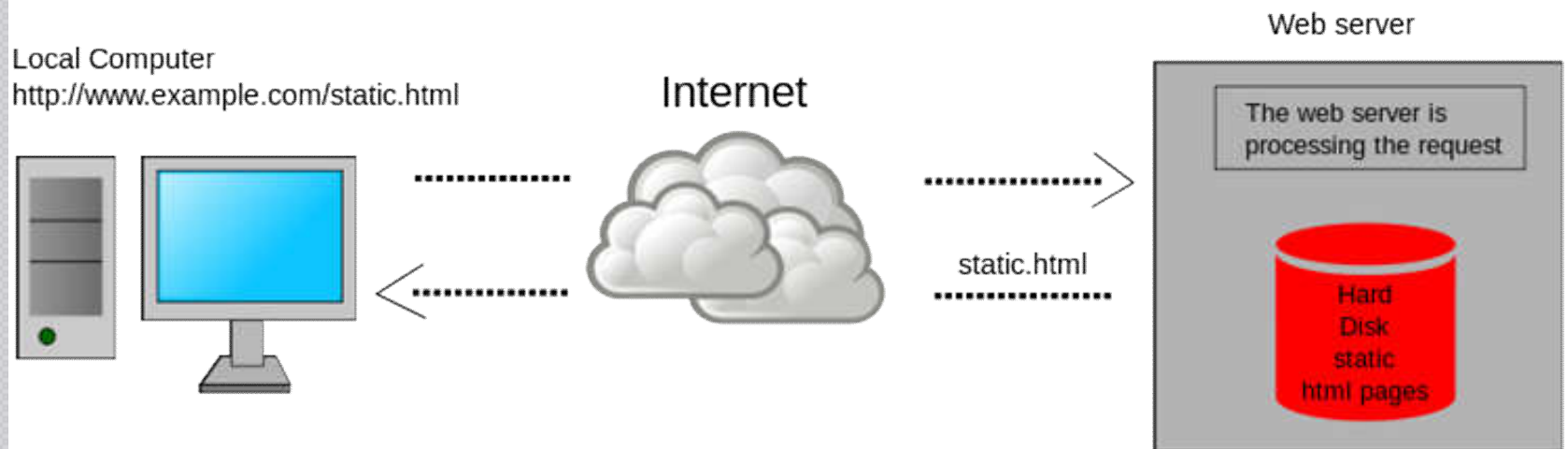
Dynamic Web Page

- Contents can change based on user's interaction

- May interact with database

Local Computer
http://www.example.com/login.php

Internet

Web server

The web server is processing the request

PHP interpreter

page in html

HARD DISK MySQL db
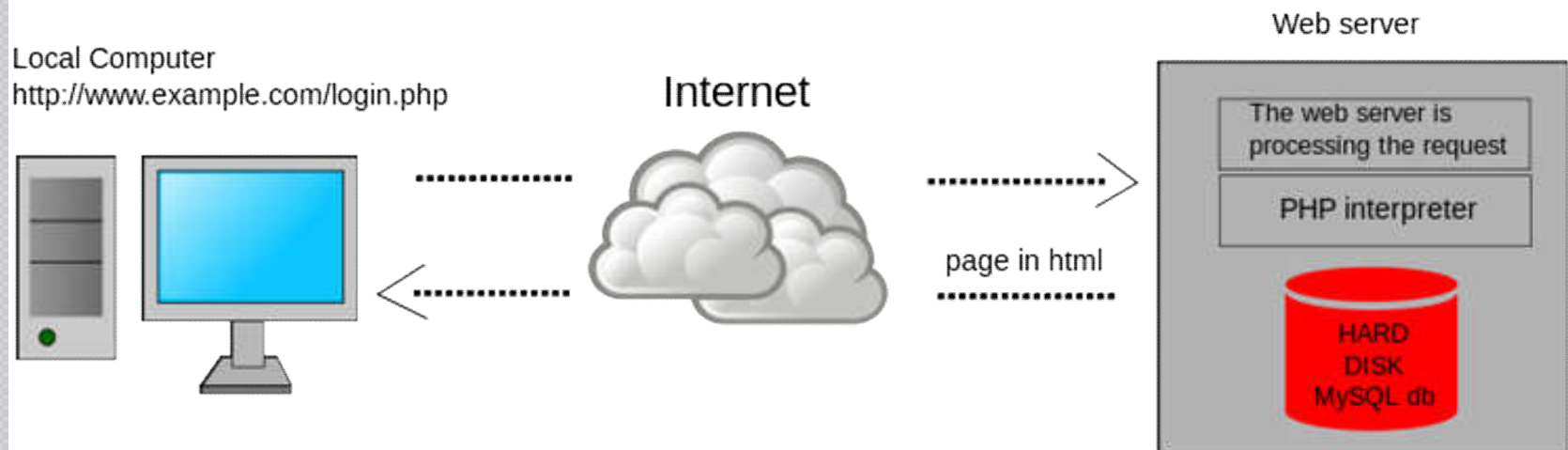
- PHP, ASP, JSP, JavaScript, VbScript

FTP
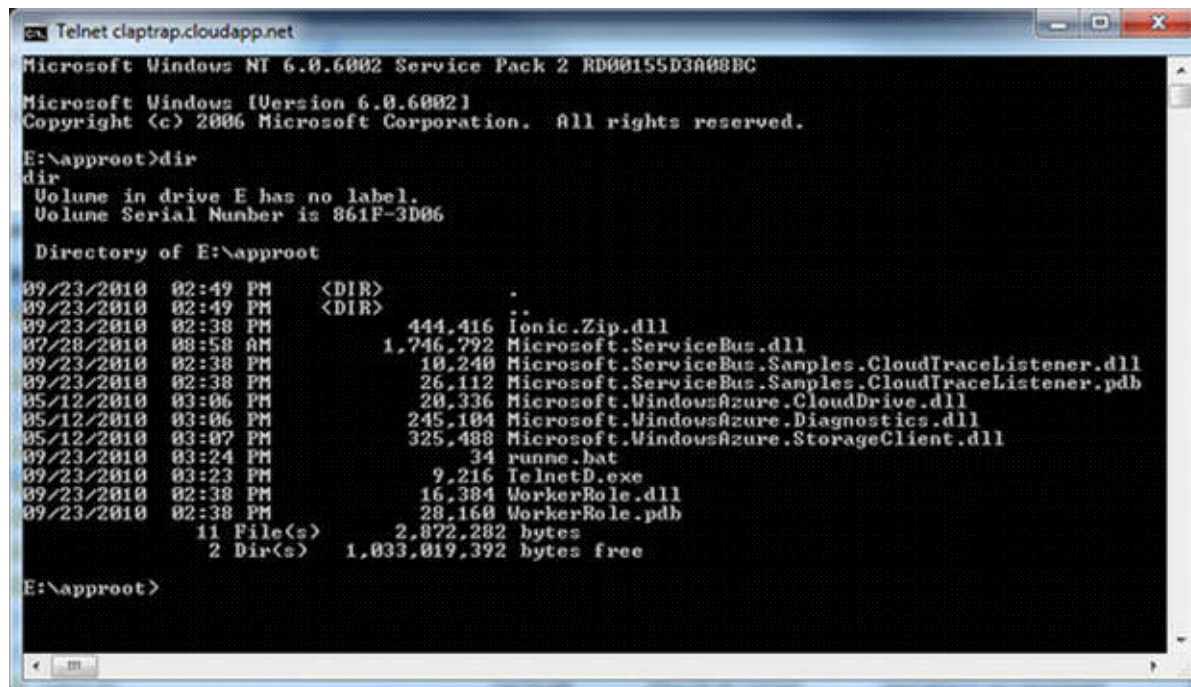
- File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over a TCP-based network, such as the Internet.

Telnet - SSH

- Provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection.

Web search engine

- A software system that is designed to search for information on the World Wide Web

- Popular search engines: Google, Yahoo, Baidu, Bing, Yandex etc.

- Google also has many specialized search engines and other products

  (http://www.google.co.th/intl/en/about/products/)

  - Google Scholar (scholar.google.com)

  - Google Finance

  - Google Trends

  - Google News

Google Search Tricks

- Put words you want to search in between quotation marks ("") and Google will search for that exact word orders.

- You can ask google question like "What day is today?"

- Or you can type in a calculation problem, and Google will solve it for you. Or search for *calculator.*

- *site:* will limit the search result to a website.

- goo.gl helps shorten a link (URL)

Google Image Search

- https://images.google.com

Search by Image

- Beside keywords, you can use image itself for searching with Google Image Search
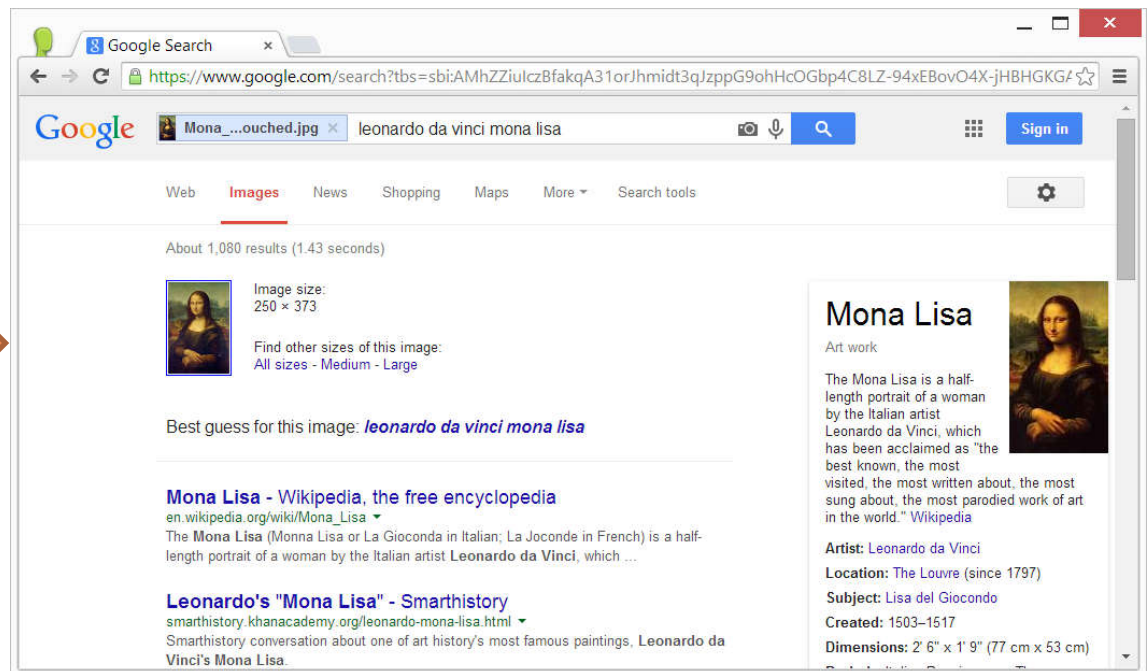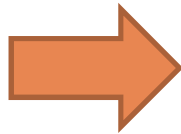
Search by Image [2]

- How to perform Search by Image

1

2

3

Download Image
Download Image As...
Copy Image URL
Save Image
Save Image As...

4

Drag and Drop	**Upload an Image**	**Copy and Paste URL for an Image**	**Right-click an Image on the Web**
• Drag and drop an image from the web or computer into the search box	• Click the camera icon • Select "Upload an image". • Choose image to upload.	• Right-click the image and copy the URL On images.google.com • Click the camera icon • Select "Paste the URL"	• Need web browser extension • Just right-click on an image to search

Conversation

- **Conversation**

  - USENET newsgroup

  - Online Chat

    - IRC

    - Instant messaging: LINE, google talk, skype, etc

  - Web board
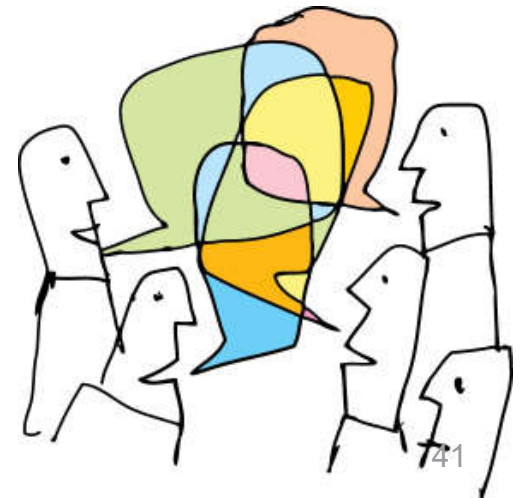
Social Media

- Means of interactions among people in virtual communities and networks

- Create

- Share

- Exchange information and ideas

Notable Social Media

- **Blog**: Blogger, Tumblr, Wordpress

- **Video Sharing**: YouTube, Vimeo, SocialCam

- **Social Networking**: Facebook, Google+, Hi5

- **Micro Blog**: Twitter

- **Picture Album**: Flickr, Shutterfly, Photobucket

- **Bookmark**: Digg, Pinterest, Stumble Upon
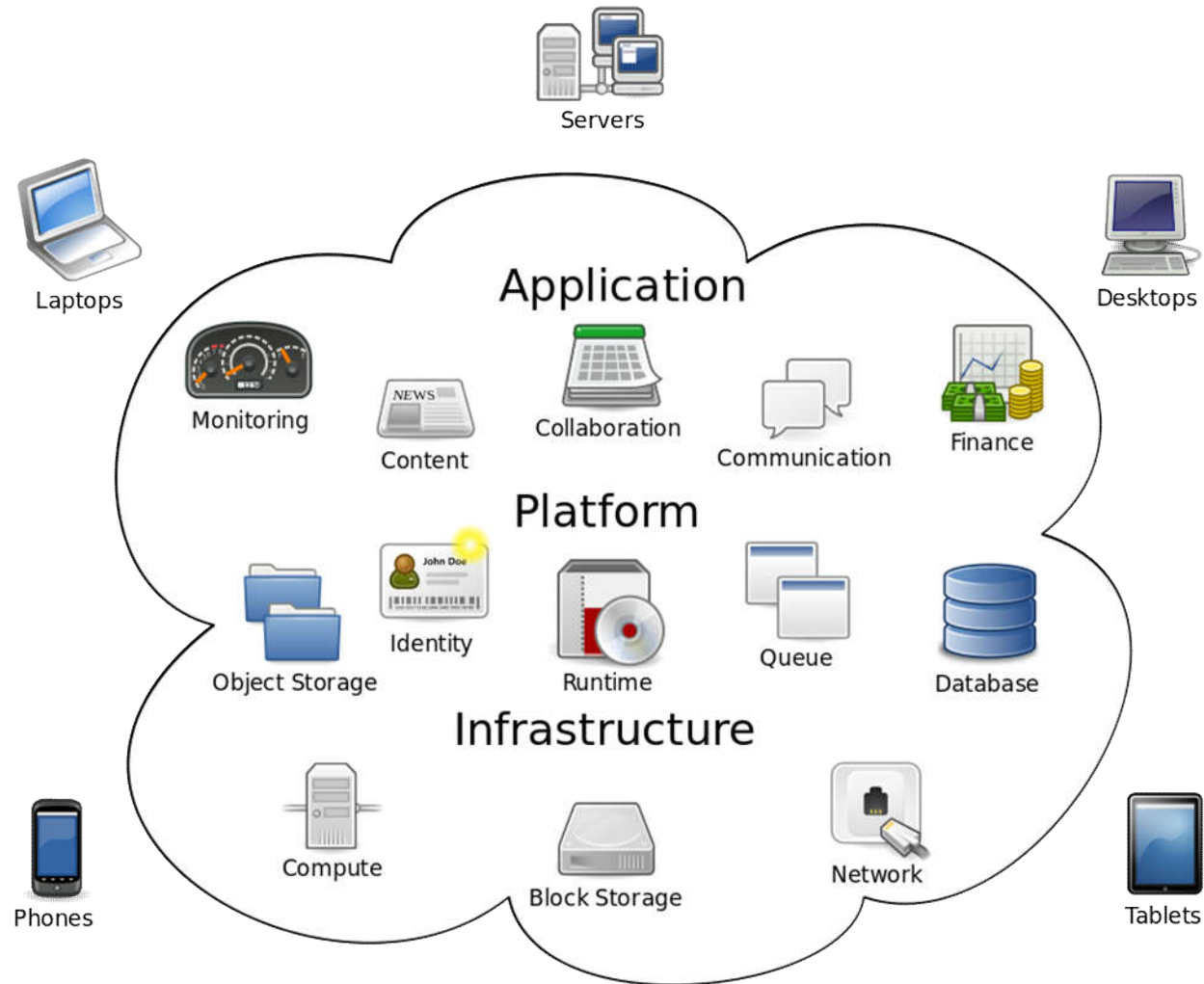
Cloud Computing

Notable Cloud Applications

- Cloud storage: Dropbox, Google Drive, Microsoft Skydrive, Apple iCloud

Notable Cloud Applications

- Office Application: Google Documents, Microsoft Office
  Web App

- Online Collaboration

Google Docs

- http://docs.google.com or https://drive.google.com

  ○ Office Suite from Google

  ○ Free to Use

Microsoft Office Online

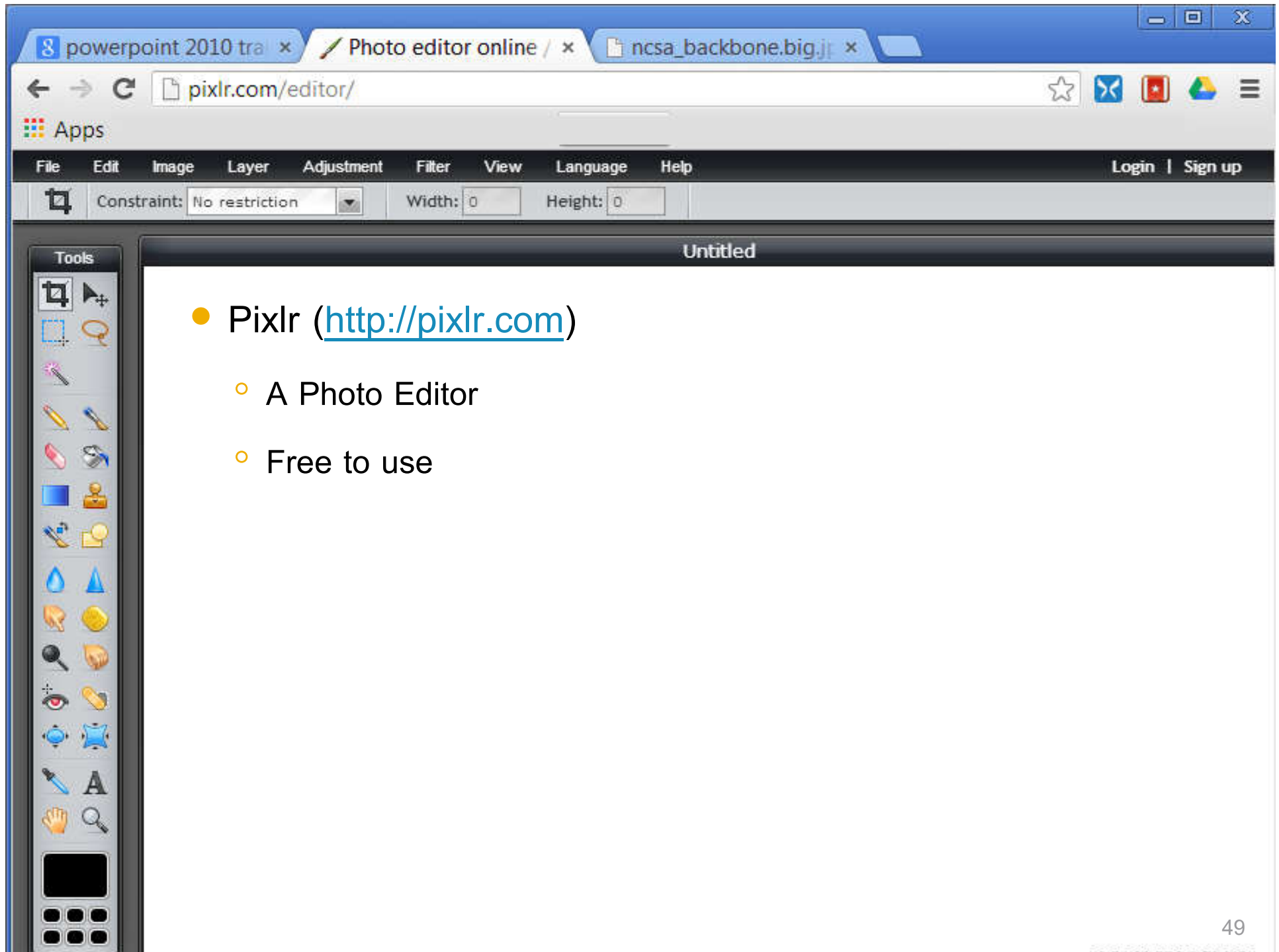- http://office.com or CMU Student e-mail login

  - Office Suite from Microsoft

  - Similar to Offline version of Microsoft Office

  - Free to Use

- Pixlr (http://pixlr.com)
    - A Photo Editor
    - Free to use

Review

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