

THE INTERNET

EGCO342 INFORMATION TECHNOLOGY IN DAILY LIFE

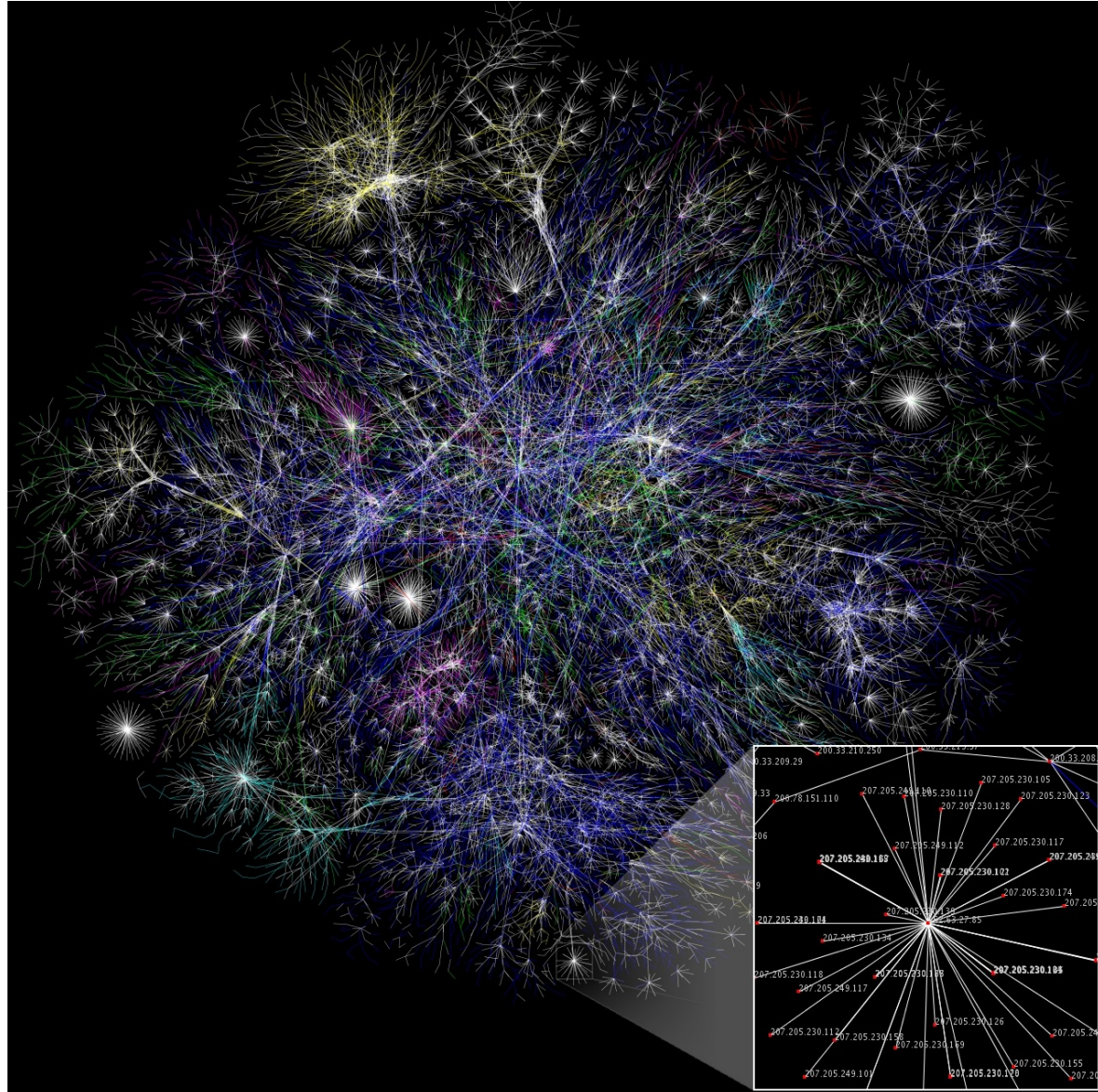


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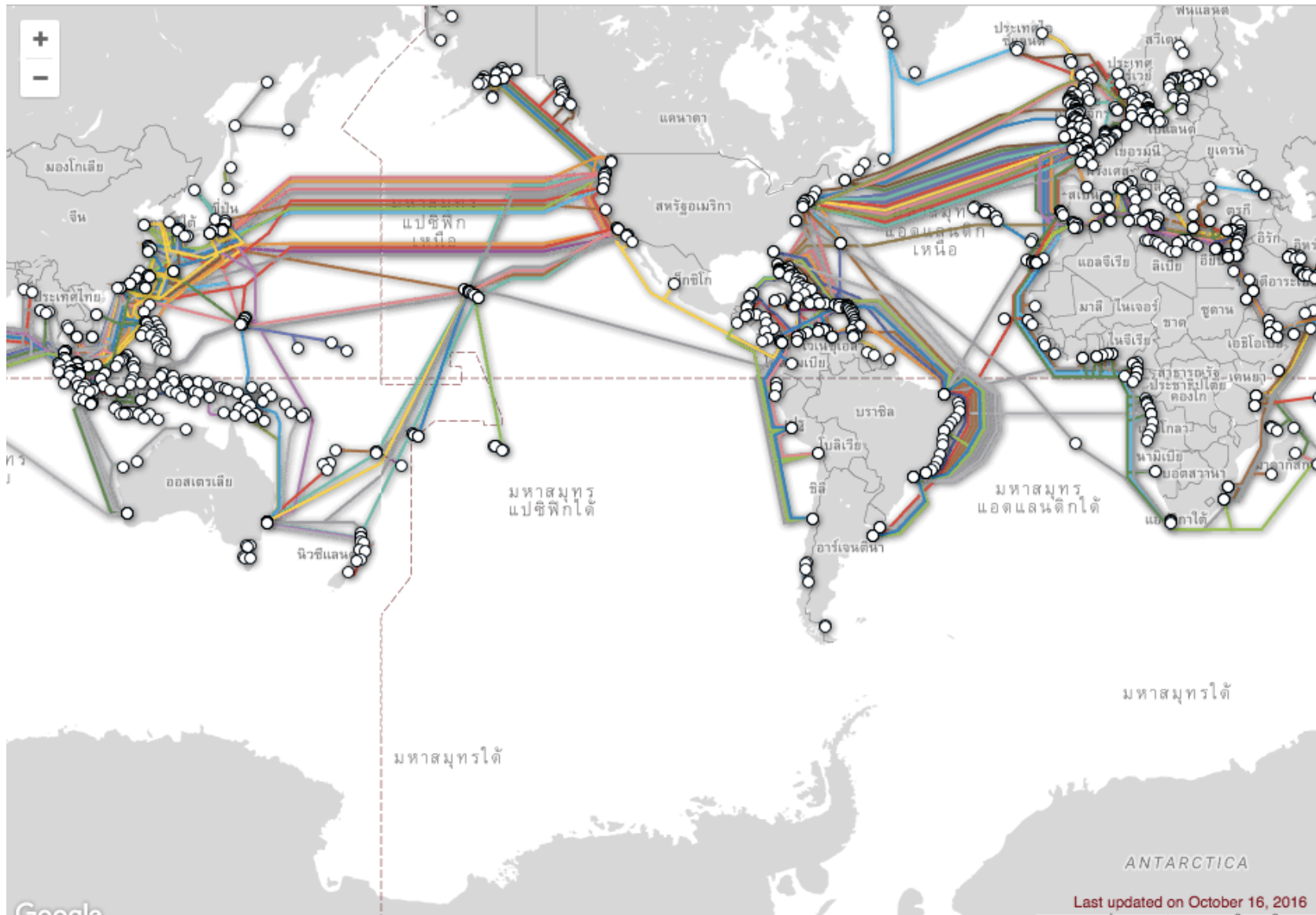
Origin of the Internet

- Developed while U.S. was in midst of Cold War with Soviet Union
- Created to respond to two concerns:
 - Establishing a secure form of military communications
 - Creating a means by which all computers could communicate
- Evolved from Advanced Research Projects Agency Network (ARPANET)
 - Vinton Cerf & Robert Kahn
- First communication occurred in 1969
- World Wide Web is subset of the Internet
 - Common protocols enable computers to talk to each other
 - Special links enable navigation

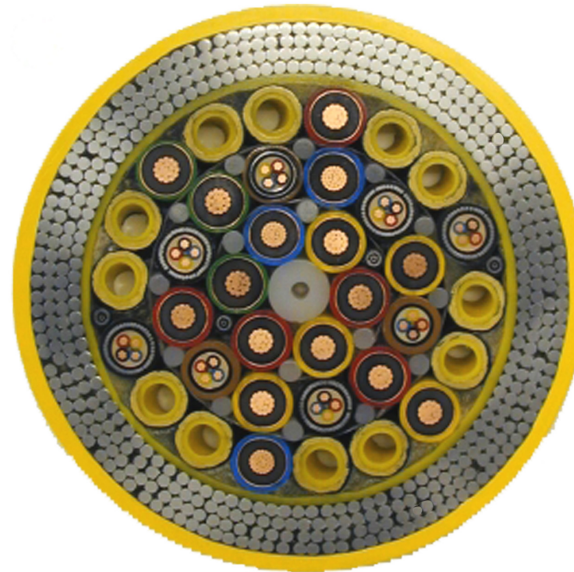
Internet Map



The physical side of the internet (1)



The physical side of the internet (2)



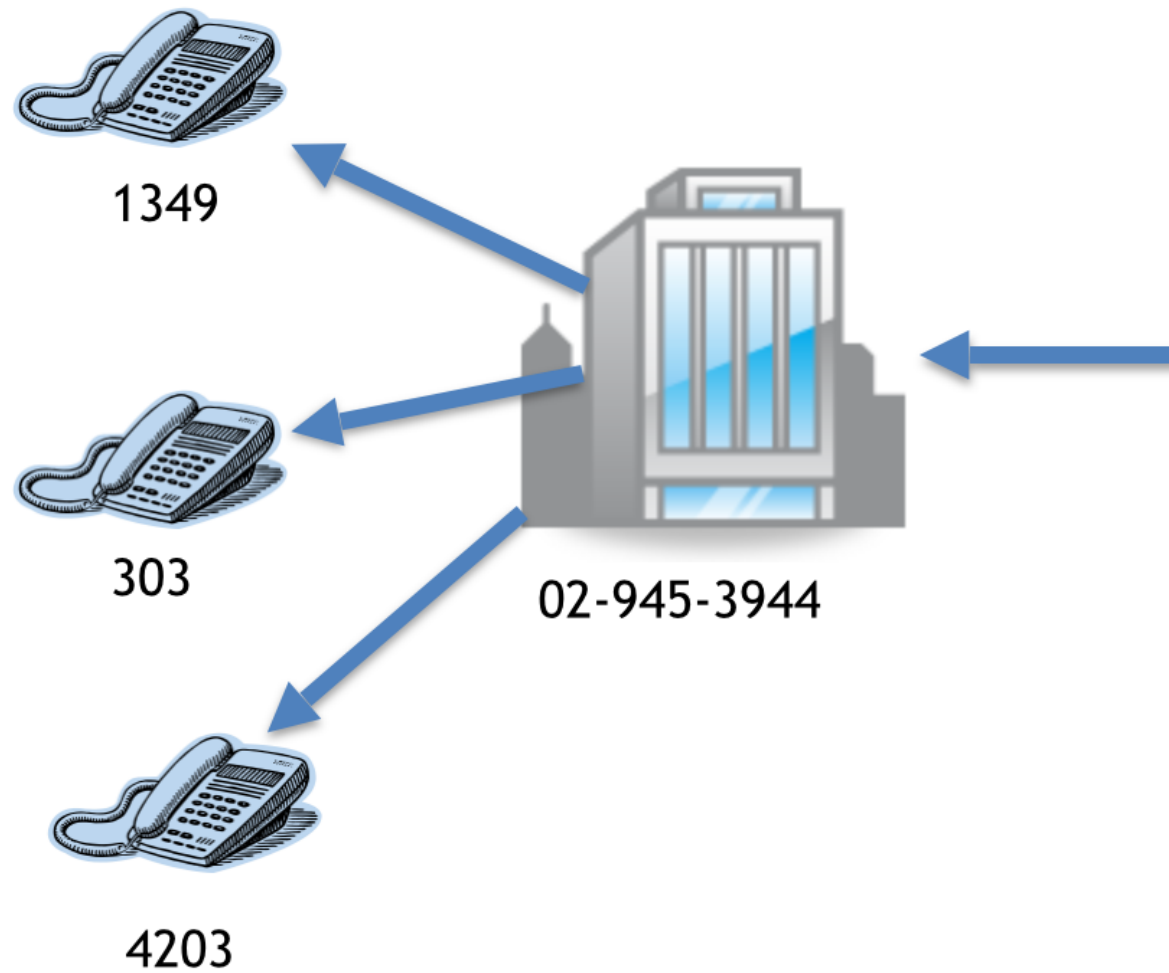
The Internet

- Computer Network
- Use IP (Internet Protocol) to communicate
 - Mostly through TCP/IP
- Connect world wide
 - <http://internet-map.net/>
- To go some where we need address
- Where does it come from?
 - ISP -> How did they get theirs?
- IP address is handed out by Internet Assigned Numbers Authority (IANA)
 - <http://www.iana.org>

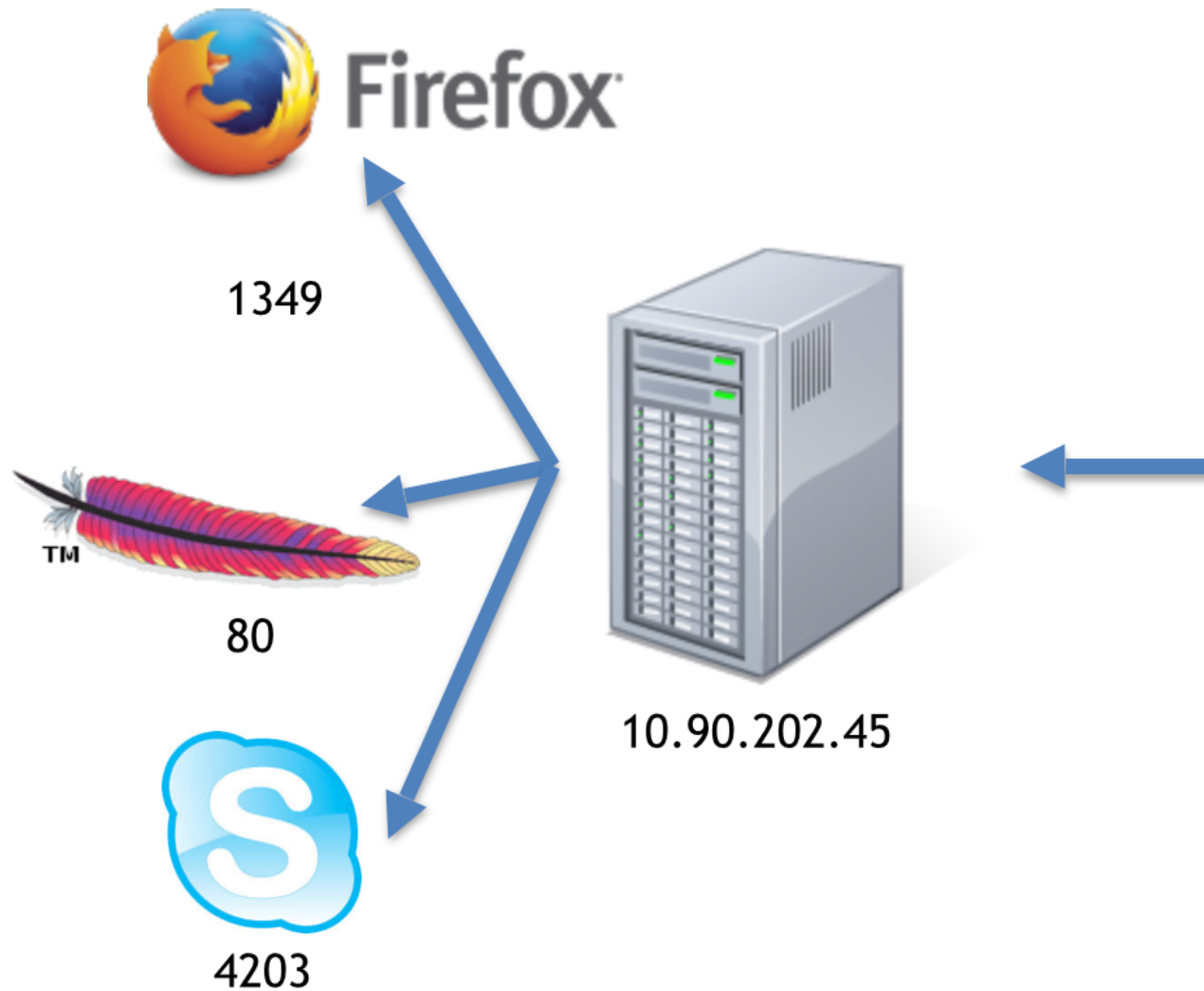
Private IP

- Some IPs are reserved for private use. (Can't be used to talk with others on the Internet)
- Class A: 10.0.0.0 - 10.255.255.255
- Class B: 172.16.0.0 - 172.31.255.255
- Class C: 192.168.0.0 - 192.168.255.255

Port Number (1)



Port Number (2)



Port Number (3)

- IP:Port e.g. 10.90.203.45:6830
- Each program can send and receive data. How does a computer knows whose data it is receiving?
- Each communication is done through a “port”
- Works like an extension number on the phone.
- Sending to a wrong port = talking to a wrong person.
- How do we know what port we should connect to?
 - Task -> Protocol for the task -> Official port for protocol
- Example
 - Get a webpage -> Protocol http -> port 80

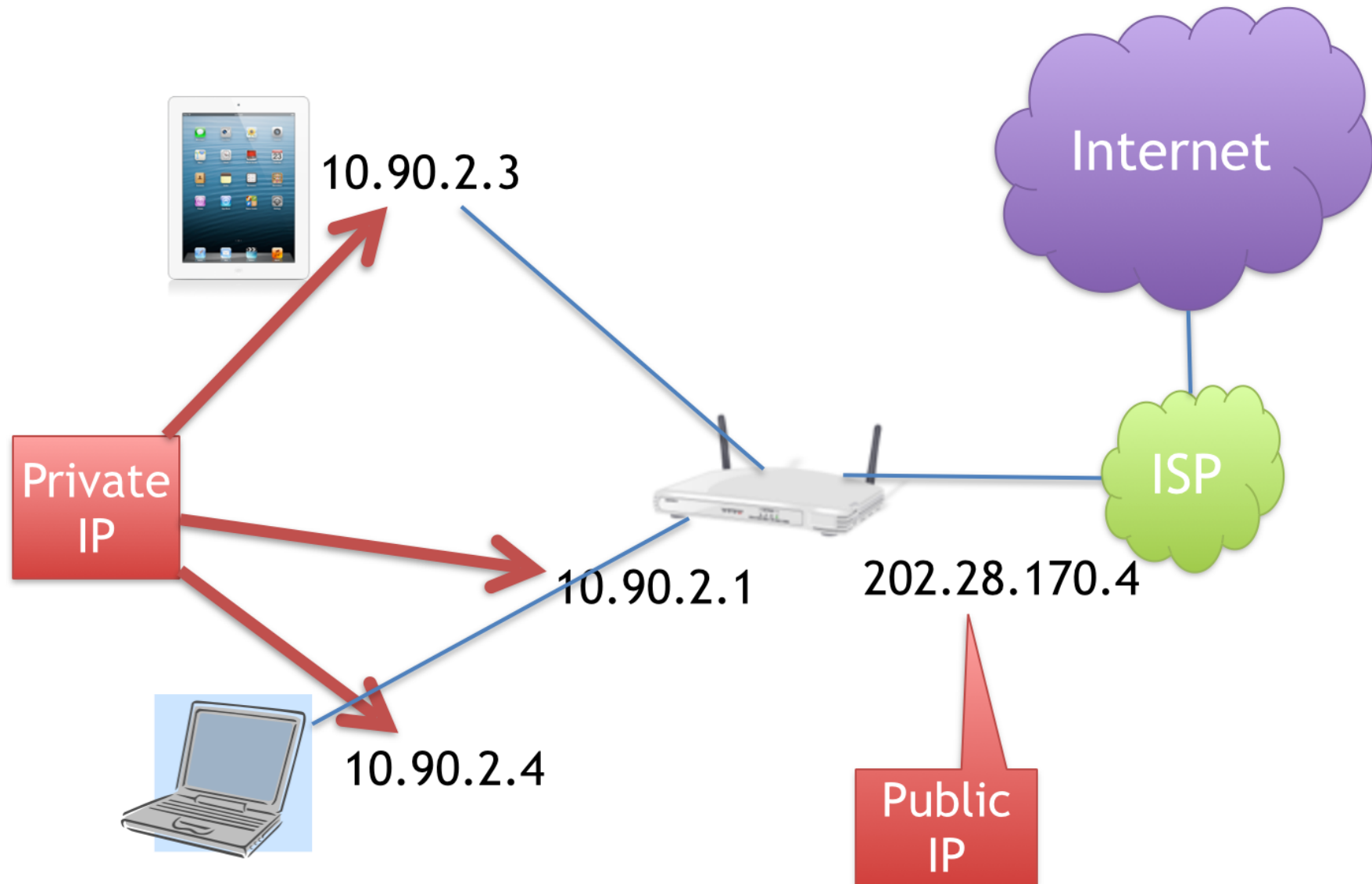
Port Number (4)

- Total possible ports = 65,535
- Official ports for protocols
 - [http://www.iana.org/assignments/service-names-port-numbers/
service-names-port-numbers.xml](http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml)

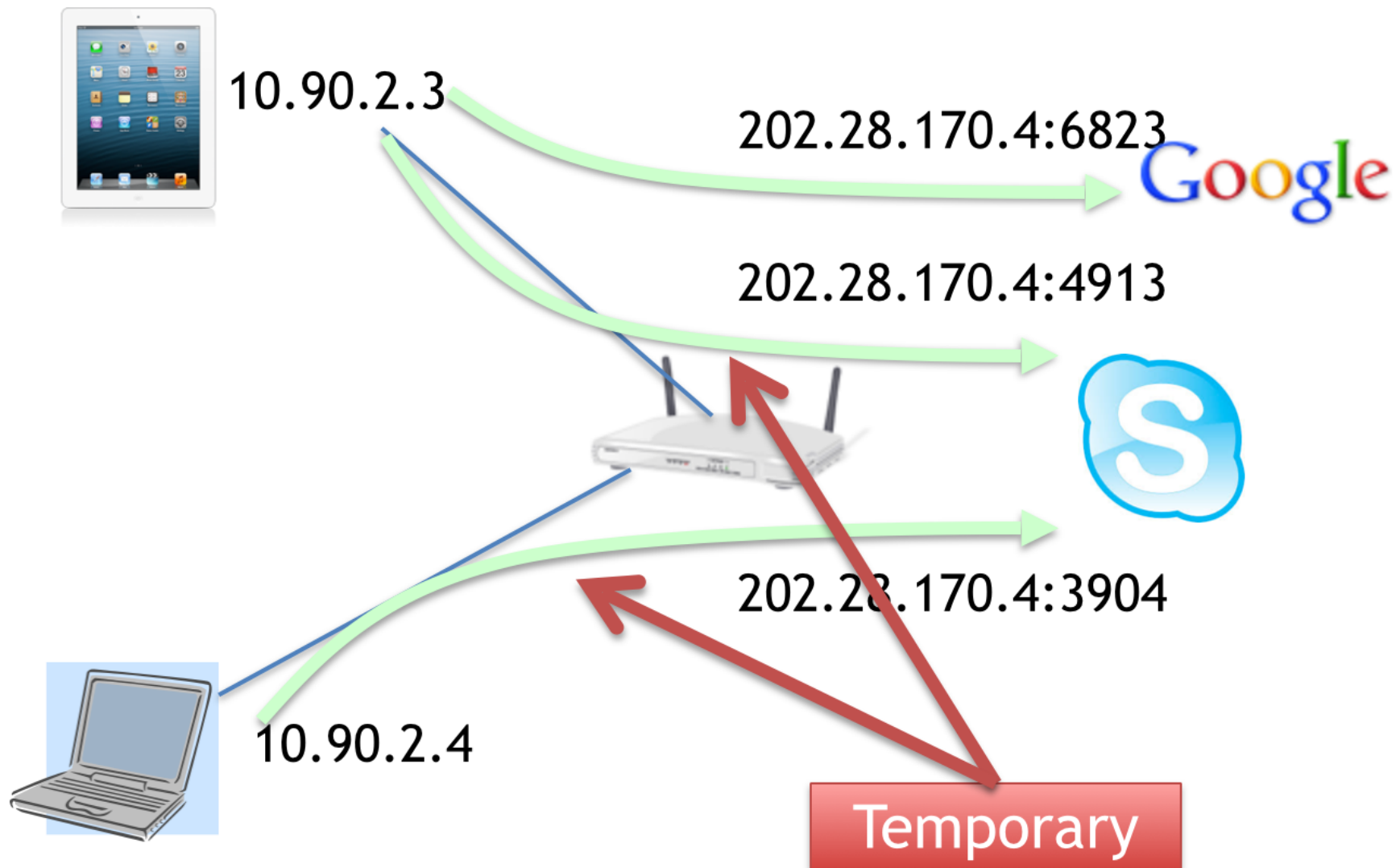
Network Address Translation (1)

- Less than 4,228,250,625 IP addresses for use
- Only get 1 real IP from ISP.
- Network Address Translation (NAT) can help
 - Router replaces your local IP address and port with the real IP address and port for outgoing packet
 - Vice versa for the incoming packet

Network Address Translation (2)



Network Address Translation (3)



Network Address Translation (4)

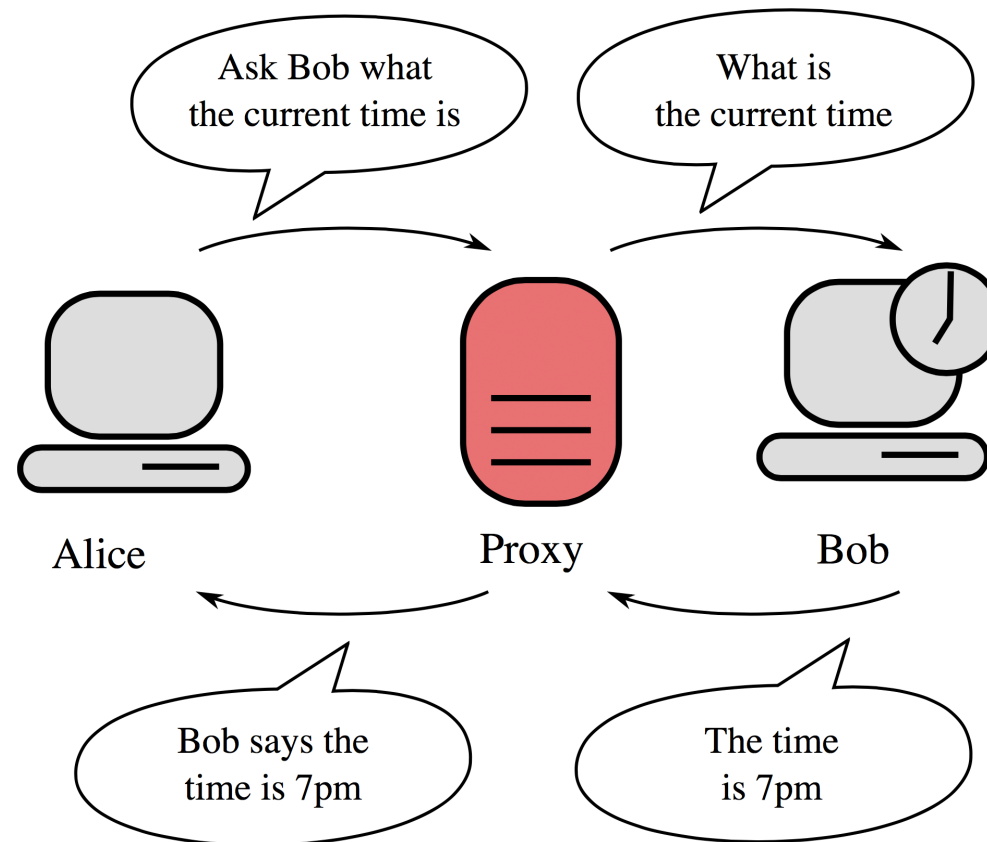
- Help protect your computer network
 - Outside cannot come inside
- Difficult for outside to reach your computer

How My Computer Get an IP?

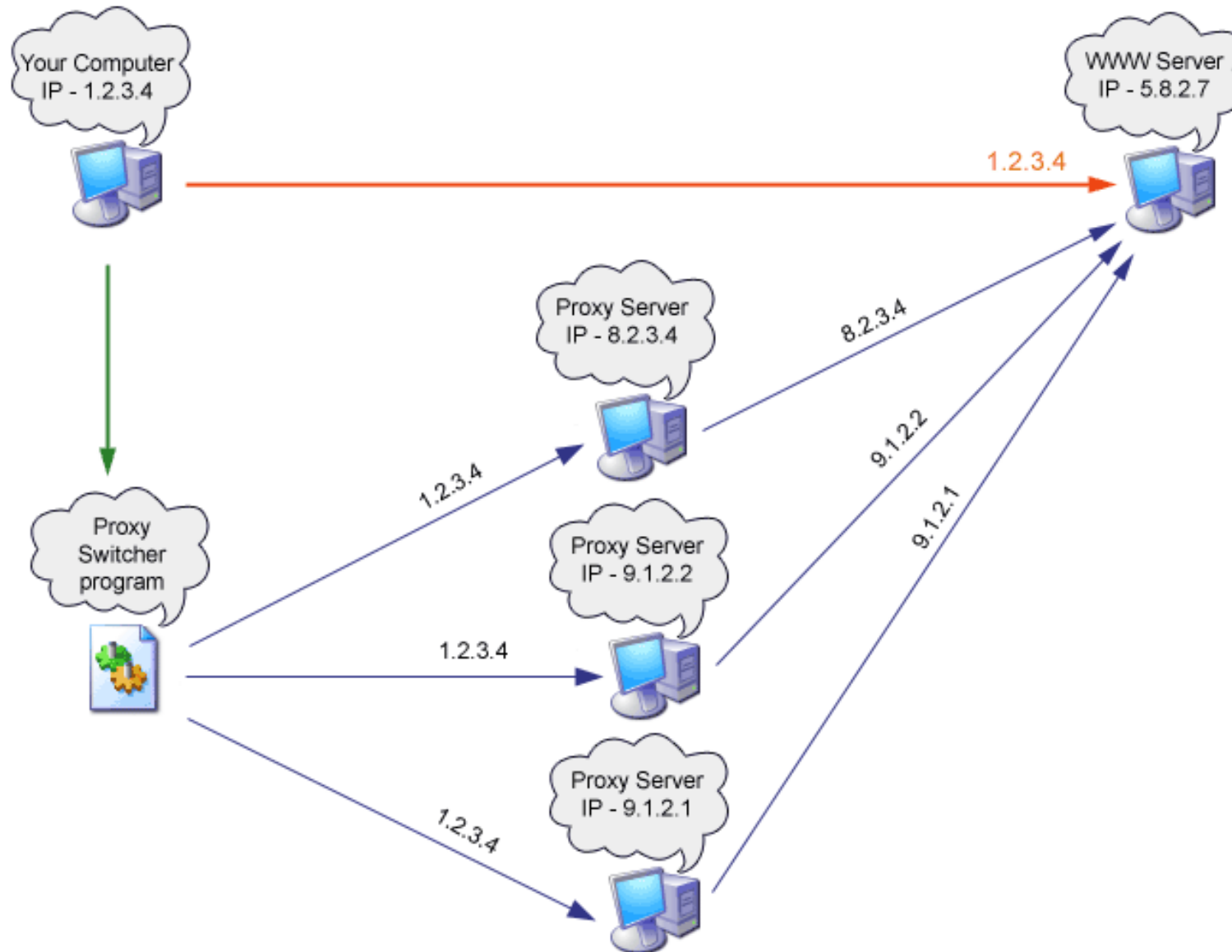
- Dynamic Host Configuration Protocol (DHCP)
- When you connect your computer yell “Who can give me IP”
- If there is a DHCP server listening, it will give your IP... Temporary.

Proxy (1)

- Sit between your computer and the internet
- Cache previously visited contents to increase loading speed
- Transparent Proxy



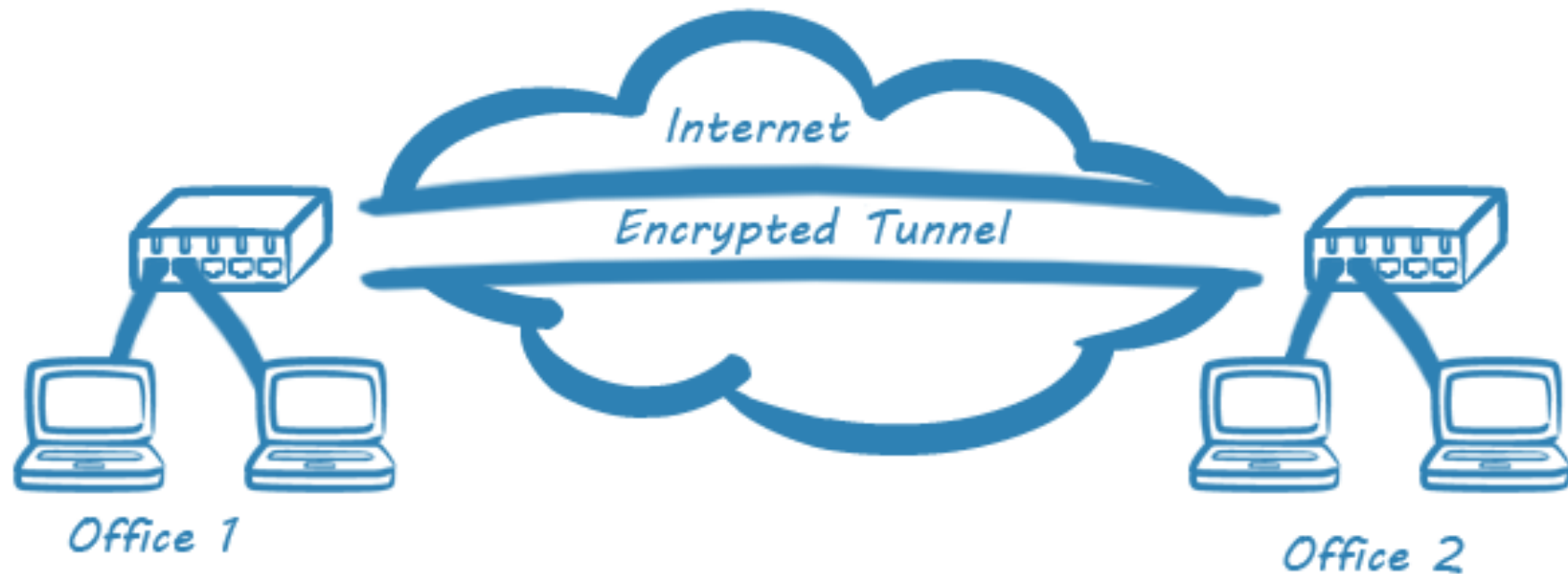
Proxy (2)



Firewall

- Block incoming connection by port and address
- Block any incoming is usually a good idea for most user.
- Behind NAT doesn't mean safe. Your friend can be your worst nightmare.

Virtual Private Network (VPN)



- Mahidol VPN: <https://vpn.mahidol.ac.th>

Getting Around the Web:

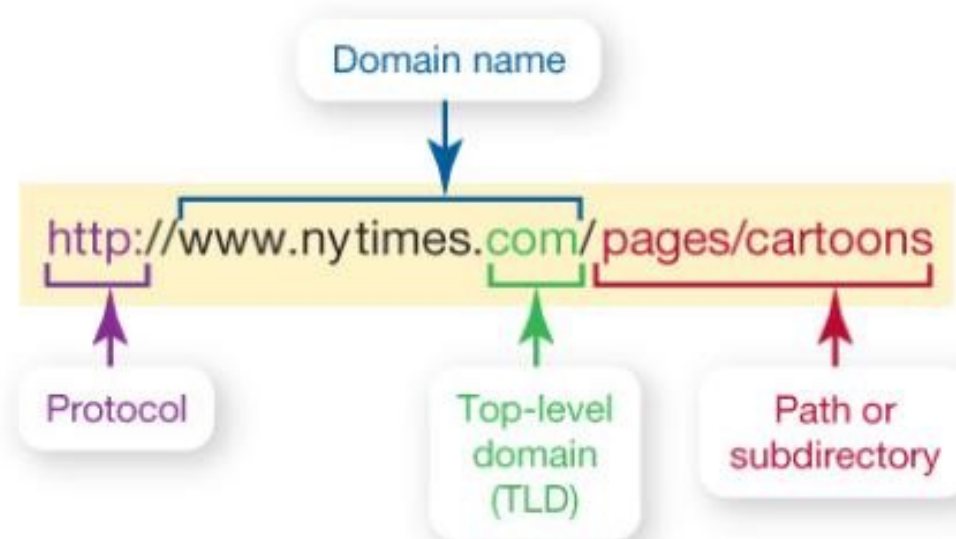
URLs, Hyperlinks, and Other Tools (1)

- How do we find anything in the Internet
- IP address?
 - Too hard to remember something like 113.21.241.54 (Do you know whose IP is this?)
- Name is easier for human but bad for computer
- Solution: Map a name to an IP

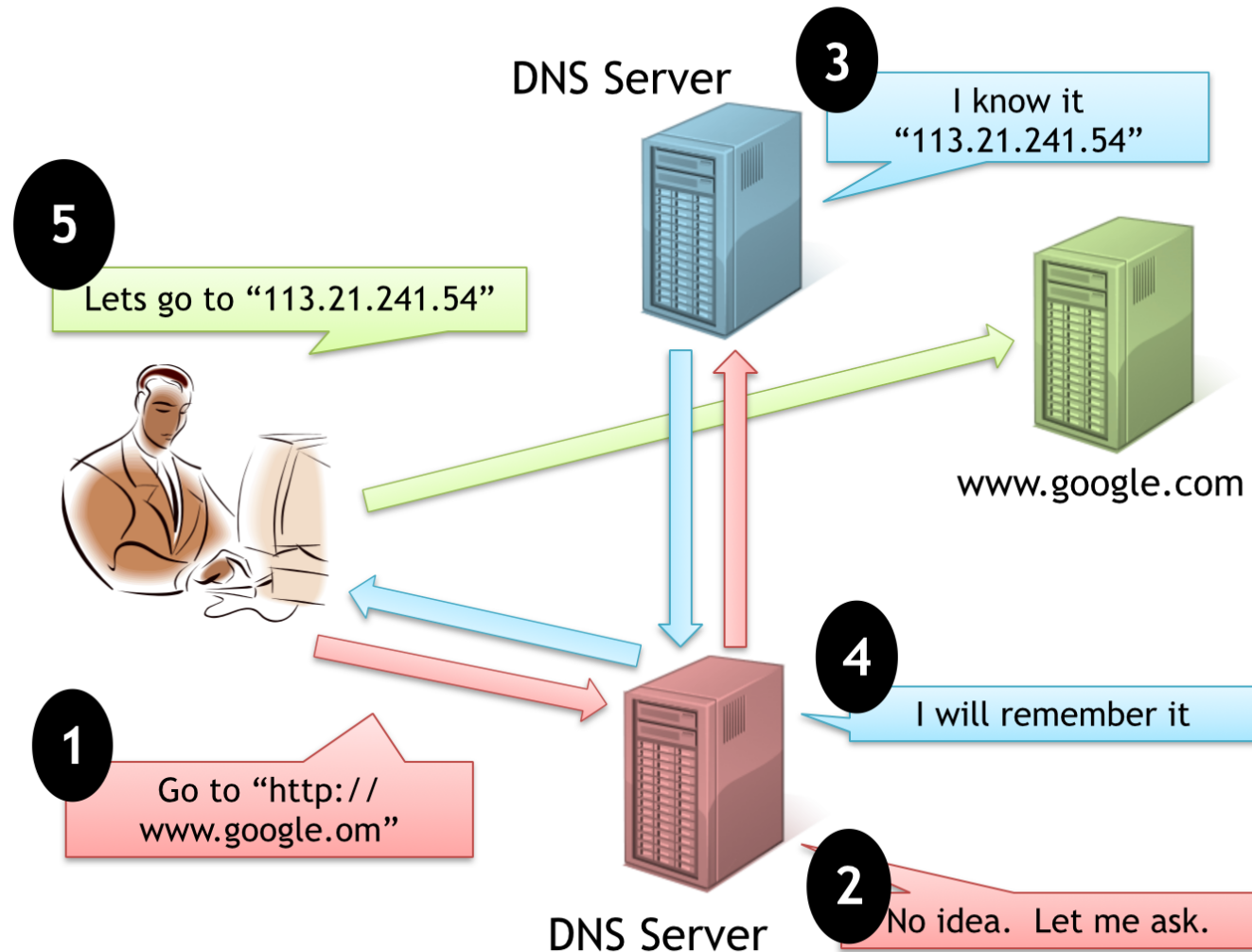
Getting Around the Web:

URLs, Hyperlinks, and Other Tools (2)

- Every Web site has a unique address
- Uniform Resource Locator (URL)
- Type URL in browser to connect to home page
- Move around site using hyperlinks



Getting Around the Web: URLs, Hyperlinks, and Other Tools (3)



Getting Around the Web:

URLs, Hyperlinks, and Other Tools (4)

- Who controls DNS?
 - <http://www.icann.org> controls the top
 - .com, .th, .org, ...

www.mahidol.ac.th

The diagram shows the URL 'www.mahidol.ac.th' with blue arrows pointing to its parts. One arrow points from the text 'Host Name' below to 'www'. Three arrows point from the text 'Domain Name' below to 'mahidol', 'ac', and 'th' respectively.

Host Name Domain Name

- You can register your own domain – Pay

Getting Around the Web:

URLs, Hyperlinks, and Other Tools (5)

Domain Name		Who Can Use the Domain Name
.com	.co.th	Originally for commercial sites but can be used
.edu	.ac.th	Degree-granting institutions
.gov	.go.th	Local, state, and United States government
.name	.in.th	Individuals
.mil	.mi.th	United States military
.org	.or.th	Organizations (often nonprofits)
.net	.net.th	Originally for networking organizations, no longer
.biz	-	Businesses
.info	-	Information service providers

What is E-Mail ?

- Electronic mail (E-Mail) is an electronic form of the traditional postal mail.
- An e-mail message can reach the recipient's e-mail account within a few seconds.
- You can also send pictures, data files, audio, and even video clips with your e-mail messages.

How e-mail works ? (1)

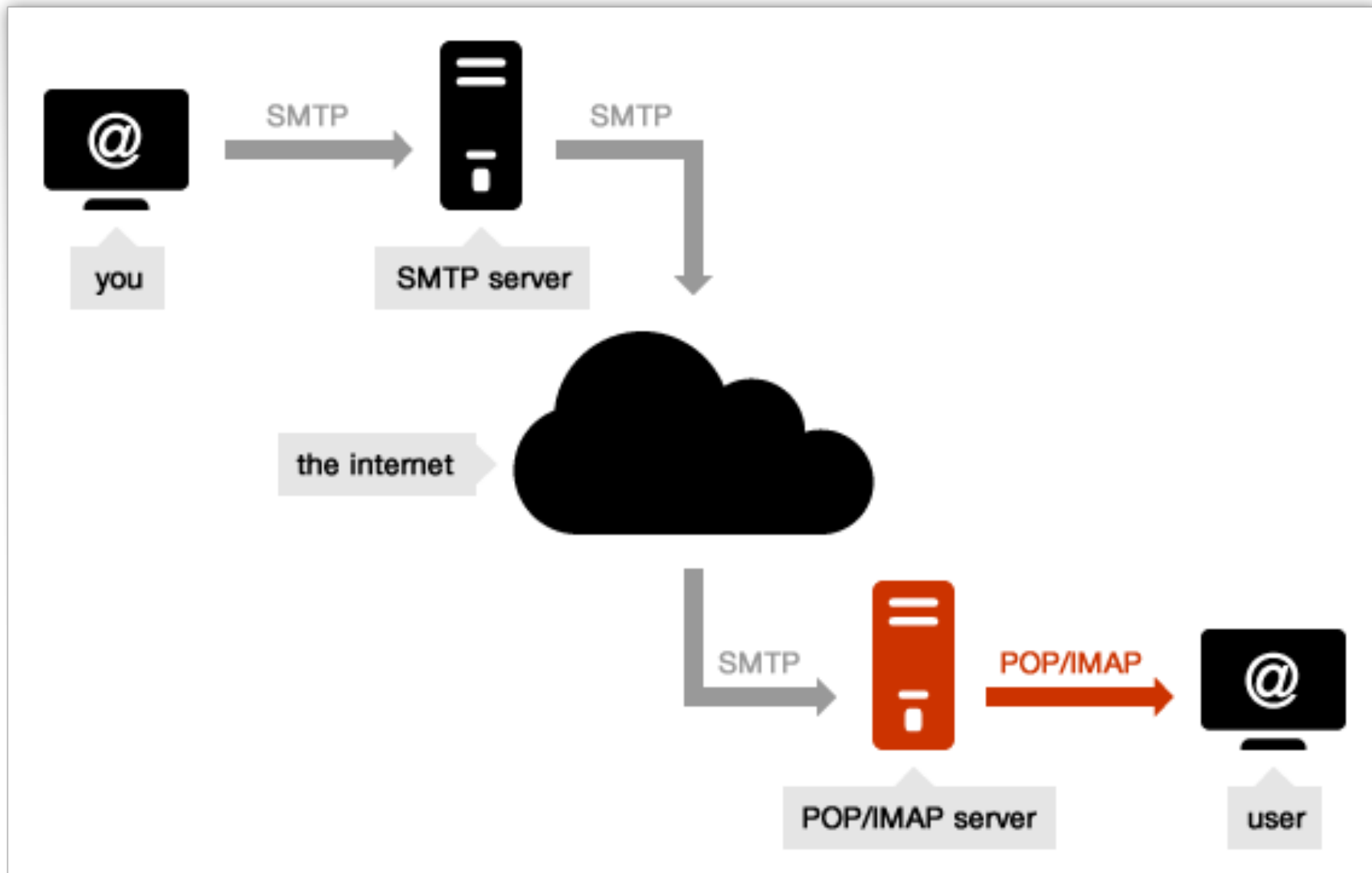
- To exchange e-mail messages with other people, you need to have an e-mail address for yourself.
- You can obtain an e-mail address by opening an account with an e-mail service provider.
- You need to know the e-mail address of the person to whom you want to send the e-mail message.

How e-mail works ? (2)

- An e-mail address has two parts separated by the @ symbol:
johndoe@example.com

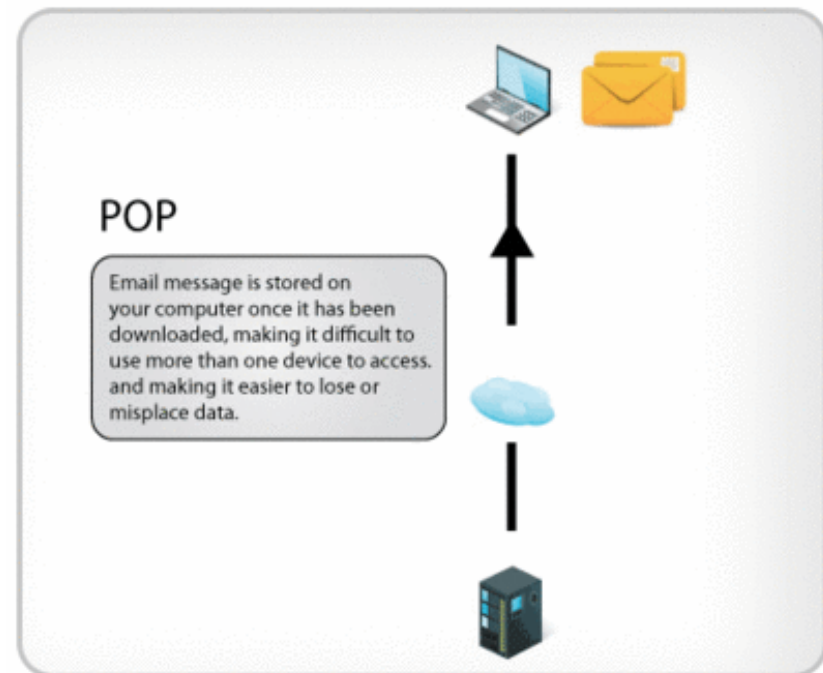
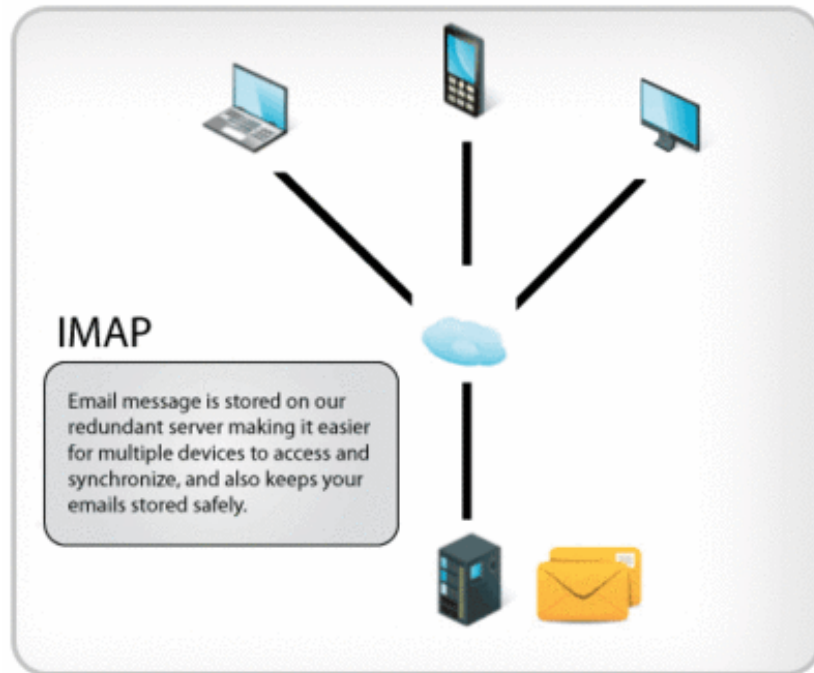
Information	Description
someone	This is the name you use to create your e-mail address. People recognize the e-mail address with the help of the user name. When you open an account with an e-mail service provider, you can specify your user name. The user name that you specify should be unique. The e-mail service provider checks if the user name you provide already exists. If it exists, you need to provide another user name.
@	The @ symbol separates the user name from the remaining part of the e-mail address.
example.com	This represents the domain name of the mail server, where all your e-mail messages are stored.

How e-mail works ? (3)



POP3 vs. IMAP

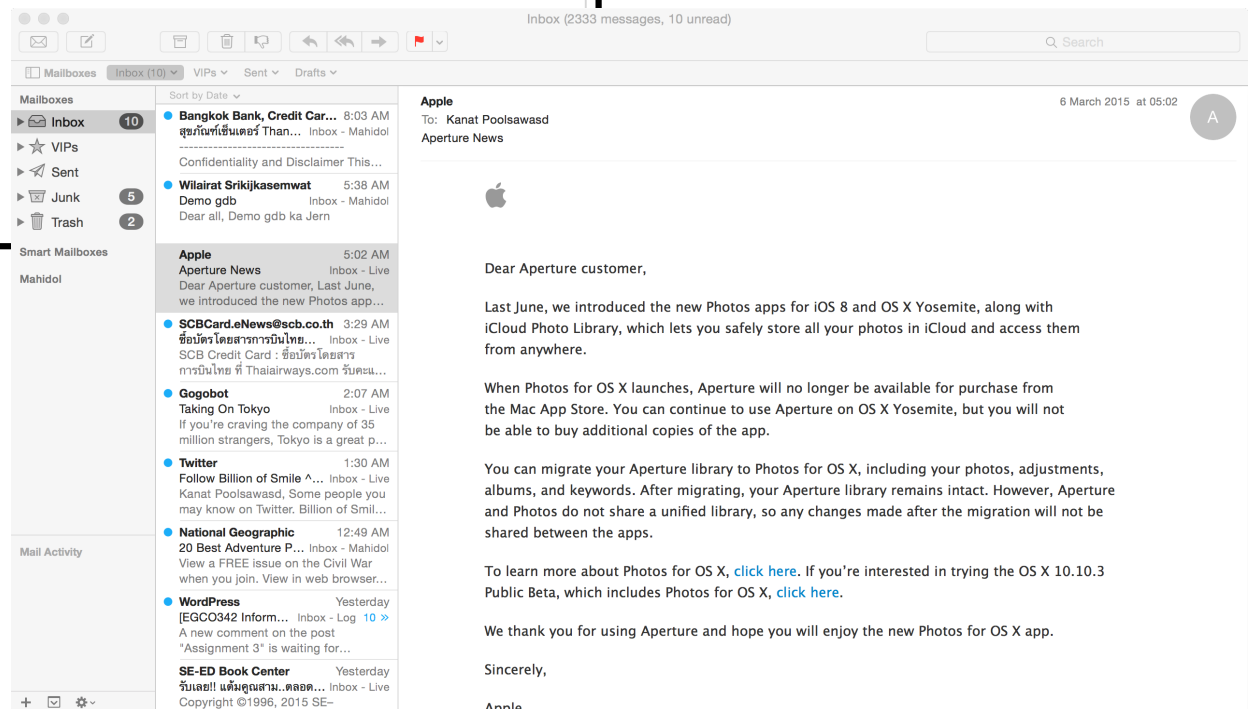
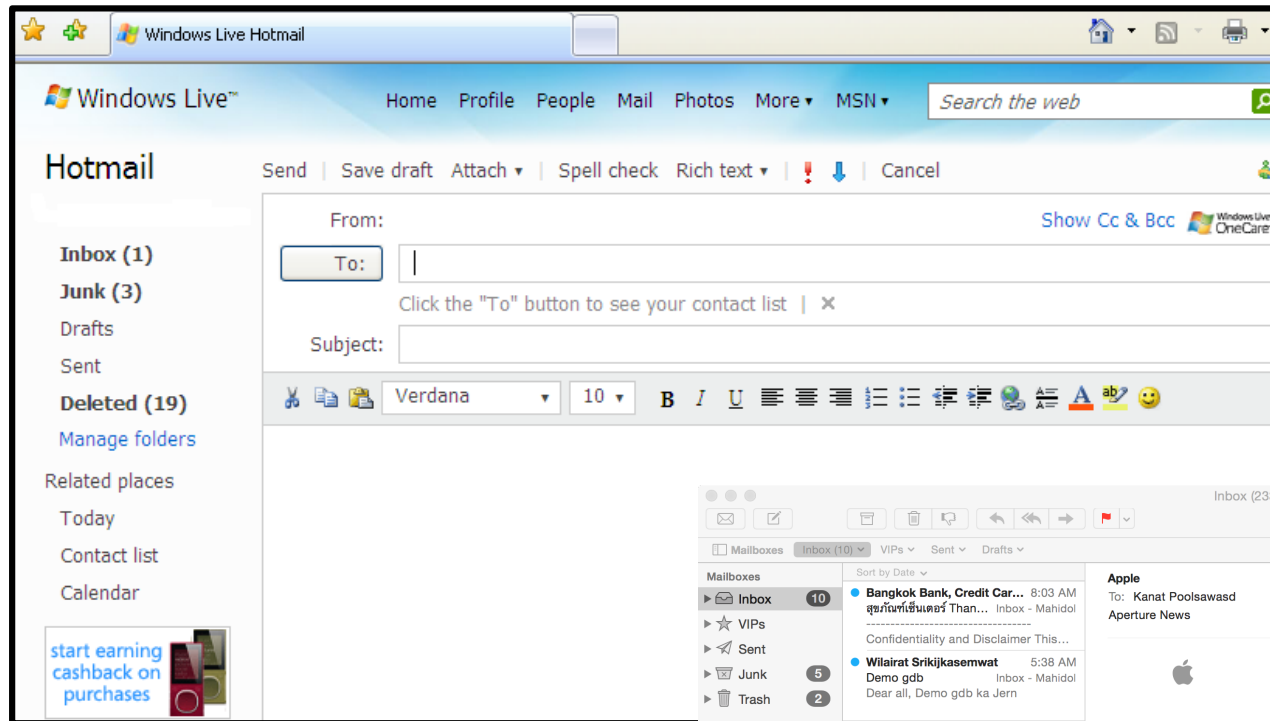
- Post Office Protocol v.3 (POP3)
- Internet Message Access Protocol (IMAP)



E-Mail Client (1)

- There are two types of e-mail clients, local and Web-based.
 - Local e-mail clients are installed on your computer, and you can use them to save e-mail messages to your hard disk. Microsoft Outlook® Express is an example of a local e-mail client.
 - Web-based e-mail clients : You can send and open e-mail messages by using the Web-based e-mail client. MSN Hotmail® is an example of a Web-based e-mail client.

E-Mail Client (2)



The Parts of an E-Mail

- To : enter the exact email address of your recipient (remember: name@provider.domain)
 - For multiple recipients, separate each address with a comma
- CC : Carbon Copy
- BCC : Blind Carbon Copy
- Subject : the topic of your email – very important
- Body : the message of your email
- Attachments : the paperclip symbol - files or photos

Replying to an E-Mail

- Reply vs Reply All
- When you click on Reply, your message will automatically be sent to the person who sent you the email (FROM field in header.)
- When you click on Reply All, your message will automatically be sent to the person who sent you the email AND everyone in the TO and CC fields in the header.

Forwarding an E-Mail

- When you click on FORWARD, you may share the email you've received by sending it to others.
- You may add your own message before sending.

Opening Attachments

- Usually photos or documents
- If you don't know the sender, do NOT open the attachment
- SAVE vs OPEN file dialog box

Deleting E-Mail & Trash Can

- Once you've read an email, you must decide if you want to save it or delete it.
- Click on delete to send the email to the TRASH CAN
- The message disappears from your list of messages but is not truly deleted yet, so if you make a mistake you can get the message back.
- Just look in the Trash folder. However, once you exit the program, the messages are usually deleted for good.

Emoticons

Facebook Emoticon	Meaning	Shortcut
	Smile	:-) :) :] =)
	Sad	:-(:(:[=(
	Tongue	:-P :-p :-p :p =P
	Wink	i-) i)
	Big Smile	:-D :D =D
	Surprised	:-O :O :-o :o
	Cry	:'(
	Geek	8-) 8) B-) B)
	Cool	8- 8 B- B
	Mad	>:(>:-(
	Very Angry	>:O >:-O >:o >:-o
	Thinking	:/ :-/ :\ :-\
	Confused	o.O O.o
	Kiss	:-* :*
	Devil	3:) 3:-)
	Angel	O:) O:-)
	Heart	<3
	Very happy	^_^
	Moody One	^-^
	Pacman	:v
	Curly Lips	:3
	Robot	:]
	Chris Putnam	:putnam:
	Shark	(^^^)
	Penguin	<(")

Searching the Web Effectively

- Narrow down the vast quantity of Web information by using:
 - Search engine: a set of programs that searches the Web for keywords
 - Subject directory: a structured outline of Web sites organized by topics
 - Metasearch engine: searches other search engines rather than individual Web sites

How Google Works

- Google takes
 - The phrase hits (the Xs),
 - The adjacency hits (the Ys),
 - The weights hits (the Zs), and
 - About 100 other secret variables
- Throws out everything but the top 2,000
- Multiplies each remaining page's individual score by its "PageRank"
- And, finally, displays the top 1,000 in order.

Search Strategies

- Boolean operators (AND, NOT, OR)
- Advanced search page
- Search for a phrase using quotation marks
- Search within a specific Web site
- Use a wild card
- Click on Timeline feature

Other Feature in Google

- Google Maps, Google Earth
- Google Drive
- Google Mail (GMail)
- Youtube (Google bought it in 2006)
- Calculator and Unit Converter
- WebGL
 - Try: $\sqrt{x^2+y^2}+3\cos(\sqrt{x^2+y^2})+5$ or
 - Try: [https://www.google.co.th/search?client=safari&rls=en&q=5+%2B+\(-sqrt\(1-x%5E2-\(y-abs\(x\)\)%5E2\)\)*cos\(30*\(\(1-x%5E2-\(y-abs\(x\)\)%5E2\)\)\),+x+is+from+-1+to+1,+y+is+from+-1+to+1.5,+z+is+from+1+to+6&ie=UTF-8&oe=UTF-8&gws_rd=cr&ei=s7YtV_3EJ8O40AS8nrTwCw](https://www.google.co.th/search?client=safari&rls=en&q=5+%2B+(-sqrt(1-x%5E2-(y-abs(x))%5E2))*cos(30*((1-x%5E2-(y-abs(x))%5E2))),+x+is+from+-1+to+1,+y+is+from+-1+to+1.5,+z+is+from+1+to+6&ie=UTF-8&oe=UTF-8&gws_rd=cr&ei=s7YtV_3EJ8O40AS8nrTwCw)
 - Visit: <http://www.webgl.com/2012/03/webgl-demo-google-search-3d-graph/>

Interesting Things

Electronic Tattoos



Massive-Scale Online Collaboration



Assignment 4

- Answer the following questions:
 - What is the age of the oldest living person? What are your sources?
 - For writing a research paper, find 3 methods for detecting fake images? What are your sources? (Note: You don't have to understand how they do it.)
 - If you get an email saying that you will get 1 cent for each person you forward the email to. Can this be true? Why?
 - Find out about dangers of Dihydrogen Monoxide. What are your sources?