



COMP 4021

Internet Computing

The Internet - Some Context for the Course

Dr. Kenneth LEUNG

This Presentation

- What is Internet Computing? Is it just a buzzword?
- What is the Internet – how big is the Internet?
- What is Web and Web 2.0?

Getting a Sense of “Internet Computing”

- Internet Computing = Internet + Computing
- Internet = Network (of two or more computers) implemented on TCP/IP network protocol
- Contrast with “Desktop computing”: Office, Calendar, which only run on one machine (What about Office 365?)
- Internet Computing = Applications running on internet to accomplish a task

What is an Internet Application?

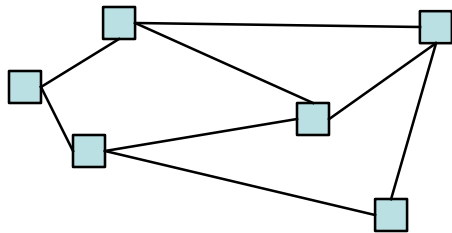
- Today, it is hard to imagine applications that do not involve a “network” or “internet”: Emails, file transfer, web, etc.
- Internet must adhere to the “Internet” protocol: TCP/IP
- Internet applications must adhere to the corresponding protocol defined over TCP/IP protocols
 - Web: HTTP (Hypertext Transfer Protocol)
 - Email: POP and SMTP

What is Internet?

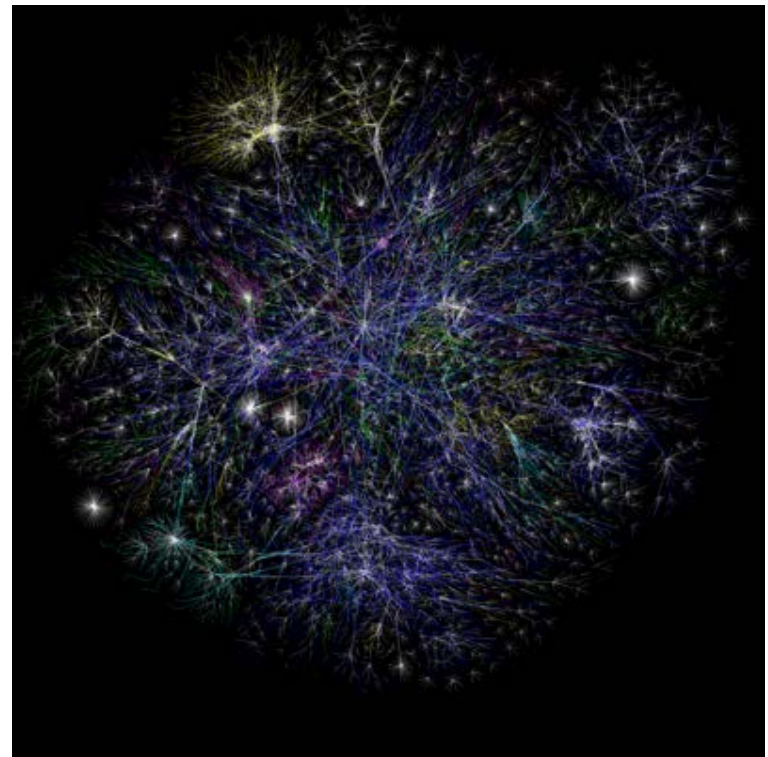
- What is the difference between a “network” and the “internet”?
- A **network** could have different architectures:
 - Star/Tree shape: One master computer is connected to many other computers by direct links
 - Ring shape: One computer is connected to two neighbors to form a ring
 - Bus shape: Every computers connected to the same wire (Ethernet)
 - Graph shape: A computer can connect to **any** other computers
- Internet must be scalable; hence Internet is a graph (although a particular segment can take any shape)

What does the Internet look like?

- A network of computers connected like a graph
- How is it compared to other topologies: Star, Ring, Bus, etc.,?



- Blue: North America
- Yellow: Asia
- White: Unknown



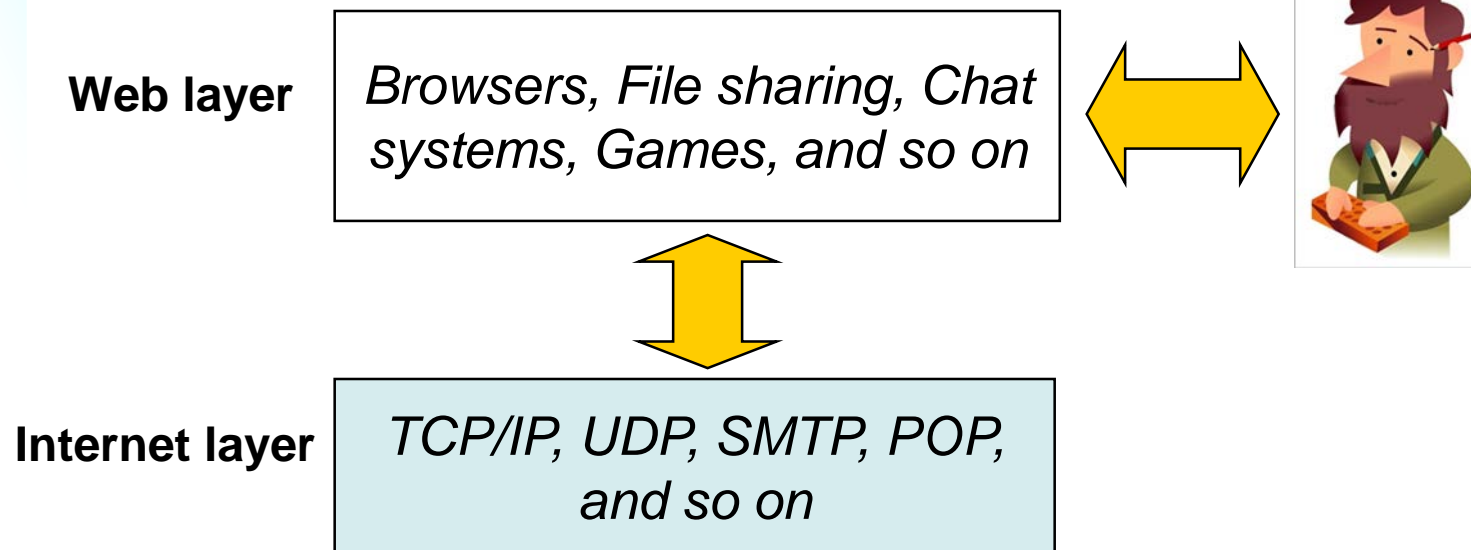
What is the Internet good for?

- Fast?
 - Traverse multiple hoops to deliver a message
- Flexible/Reliable?
 - It is not easy to partition the Internet
- Low cost?
 - Hoop-by-hoop vs direct connections between every pair of nodes
- Universal?
 - Adhere to international standards
- Accessible?
 - Available (almost) everywhere, including mobile internet/phones
- Distributed?
 - Ten of millions of computers on the Internet
- Expandable?
 - A new node just attaches to an existing node

What is the Web?

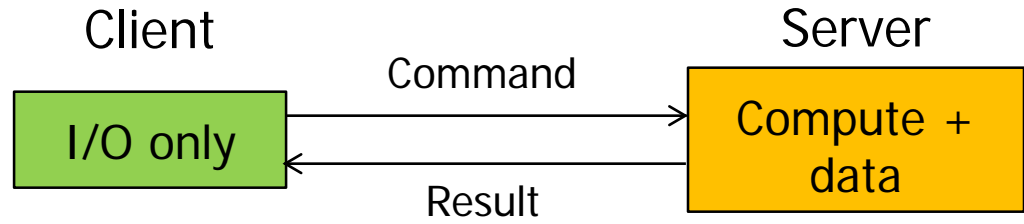
- The web is the 'layer' above the Internet
- Users typically interact with the web layer, not directly with the Internet layer

User

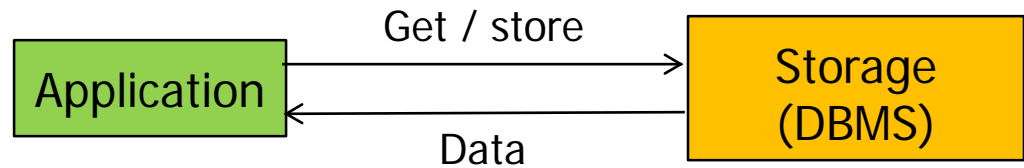


Architecture Involving Two Parties

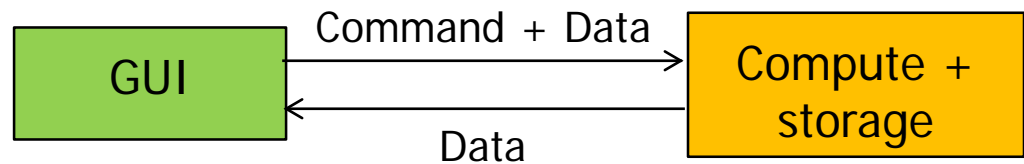
Dumb Client: Client does almost nothing (e.g., ssh terminal)



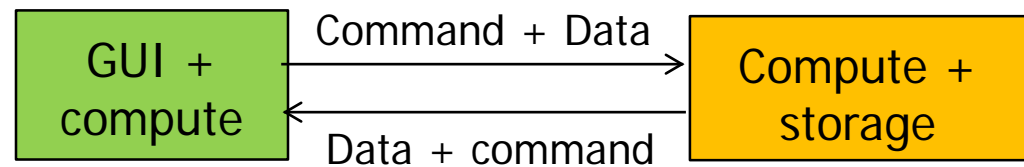
Desktop: Client does almost everything (e.g., Office editing a file on network drive)



Client-server (Thin client): Client does GUI only (e.g., control mouse and windows)

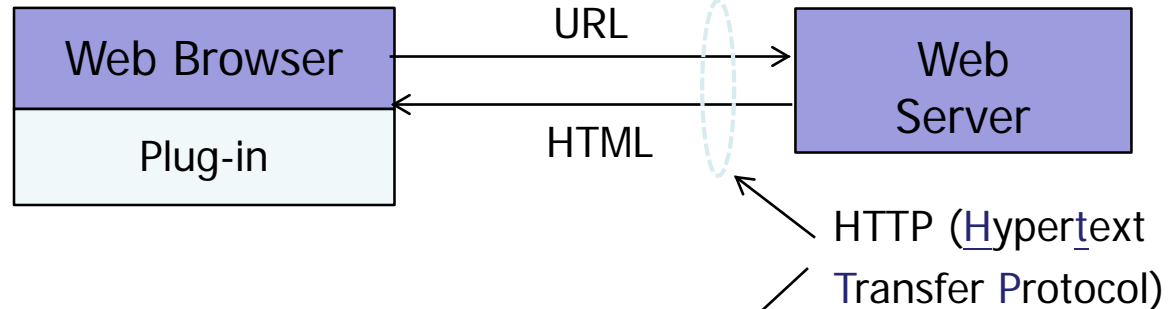


Client-server (Thick client): Intelligent partitioning of work between client and server

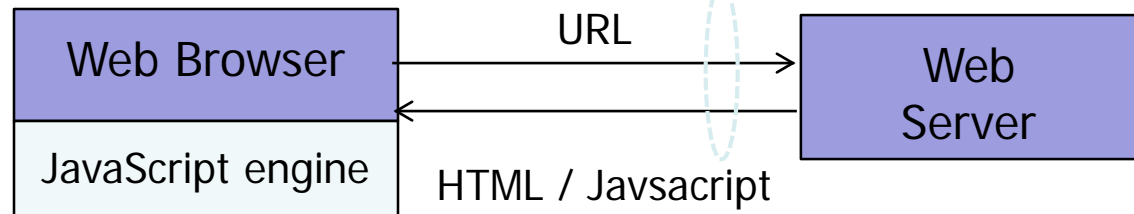


Rich Internet Applications (RIAs)

Web 1.0



Web 2.0



Web 1.0	Web 2.0
Simple browser	Smart browser
Static web pages	Smart web pages
Simple interaction	Smart interaction

- Web browsers become very powerful (Javascript, HTML5, Ajax, etc.)
- Web browsers shield the users from the underlying operating systems

Web 2.0 Timeline

Web 1.0

1980's

- Web pages
- Email
- 'Individual'

2000's

• Web 2.0

- Blogging
- Podcasting
- Wikis
- Stronger use of multimedia
- 'Social' - sharing

These days most people don't use the term 'Web 2.0', because almost everything is 'Web 2.0'

Take Home Message

- Web is one of the most applications developed on Internet
- Internet Computing
 - = Web programming
 - = Browser programming + Server programming
 - + Communication