

Introduction to the Internet

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Overview

- Terms
- Internet
- Uses of Internet
- Webpage/website
- Move around a webpage
- Search Engine
- TCP/IP
- Internet Protocols
- Internet Organizations

Some Common Terms

- **The Internet** is a network of computers spanning the globe.
- **World Wide Web** is an information space where documents and other web resources are identified by Uniform Resource Locators (URLs)
- An **Internet Browser** is a software program that enables you to view Web pages on your computer. Browsers connect computers to the Internet, and allow people to “surf the Web.”
- **Internet Explorer** is one of the browsers most commonly used. There are other browsers available as well, including **Mozilla, Chrome, etc...**

- A site or area on the World Wide Web that is accessed by its own Internet address is called a **Web site**.
- **A Web Page** is like a page in a book. Websites often have several pages that you can access by clicking on **links**. A Web site can be a collection of related **Web pages**.
- Each Web site contains a **home page** (this is the original starting page) and may also contain additional pages.
- Different computers will have different home pages. You can set your own webpage.

The uses of the Internet

- 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.

Internet Service Provider (ISP)

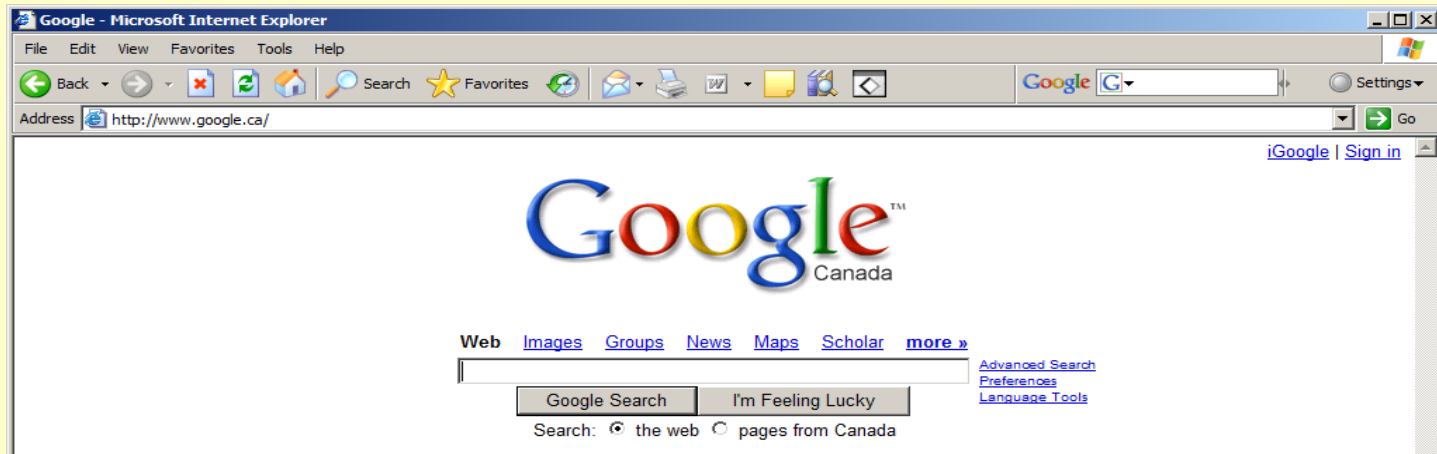
- A commercial organization with permanent connection to the Internet that sells temporary connections to subscribers.
- Examples: Prodigy, America Online, Microsoft network, AT&T Networks.
- Sify, VSNL, Relaince, AIRTEL etc..

How to access the Web?

- Web browsers are specialized programs.
- Web browsers are used to **connect you to remote computers, open and transfer files, display text and images.**
- Examples of Web browser: Chrome, Mozilla and Internet Explorer.

Layout of a Web Page

Title bar
Menu bar
Tool bar
Address bar



1. **Title bar** – tells you the name of the web page
2. **Menu bar** – has commands for moving around the webpage, printing, etc
3. **Tool bar** – short cuts to commands. Each picture represents a command
4. **Address bar** – webpage address. If you want to go directly to a web page, you will need to know the address.

Parts of a Web Address

- A web address is typically composed of **four parts**:
- For example, the address **http://www.google.in** is made up of the following areas:
- **http://**
This Web server uses Hypertext Transfer Protocol (HTTP). This is the most common protocol on the Internet.
- **www**
This site is on the World Wide Web.
- **google**
The Web server and site maintainer.
- **in**
This tells us it is a site in Canada.

- Endings of web pages tells us a bit about the page. Some common endings to web addresses are:
 - **com** (commercial)
 - **edu** (educational institution)
 - **gov** (government)
 - **net** (network)
 - **org** (organization)
- You might also see addresses that add a country code as the last part of the address such as:
 - **In(India)**
 - **ca** (Canada)
 - **uk** (United Kingdom)
 - **fr** (France)
 - **us** (United States of America)
 - **au** (Australia)

How to Search the Internet

Two basic ways

1. if you know the address of the web page
(example: www.cbc.ca)
2. Using a search engine like **Google** to find the address. This is called a **keyword search**

Typing in the Web Site Address

1. Go to the **address** bar. Click once to highlight the address. (It should turn blue).
2. Enter the following address:
www.google.com
3. Then press **Enter** on the keyboard *or* click on the word **Go** on the right side of the **Address Bar**.

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 or six-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

IP Addressing

- 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.

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**.

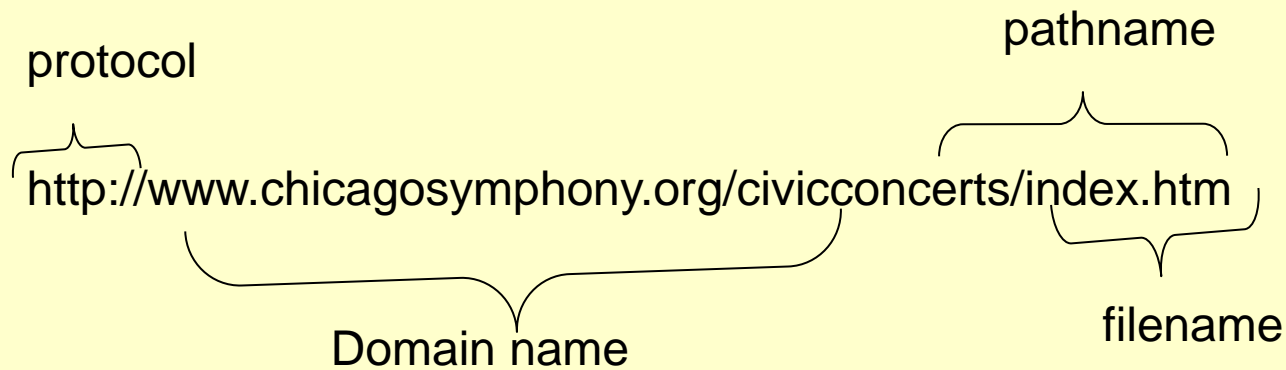
Domain Name Addressing

- 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

Structure of a Uniform Resource Locators



http => Hypertext Transfer Protocol

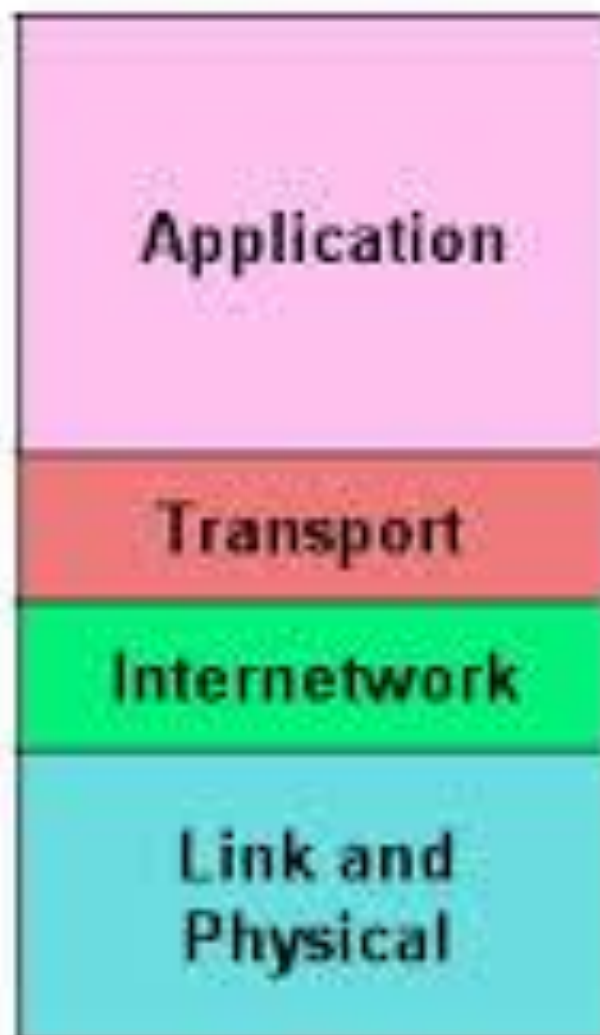
Introduction TCP/IP

- The **Internet Protocol Suite** (commonly known as **TCP/IP**) is the set of communications protocols used for the Internet and other similar networks.
- It is named from two of the most important protocols in it:
 - the Transmission Control Protocol (TCP) and
 - the Internet Protocol (IP), which were the first two networking protocols defined in this standard.

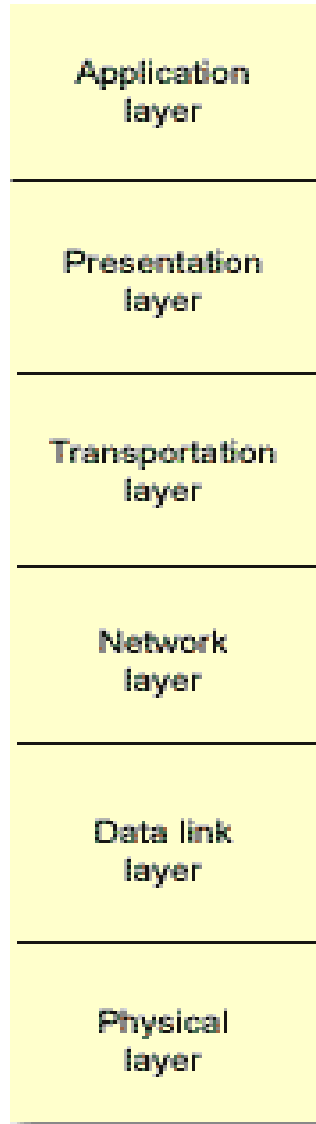
OSI Model



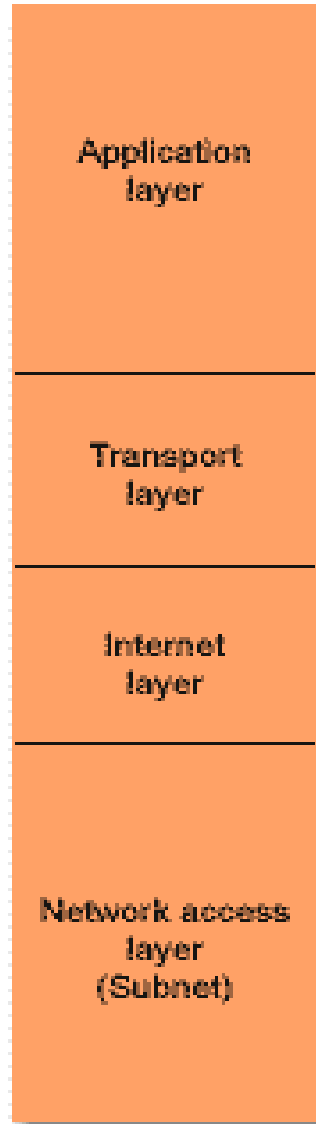
TCP / IP



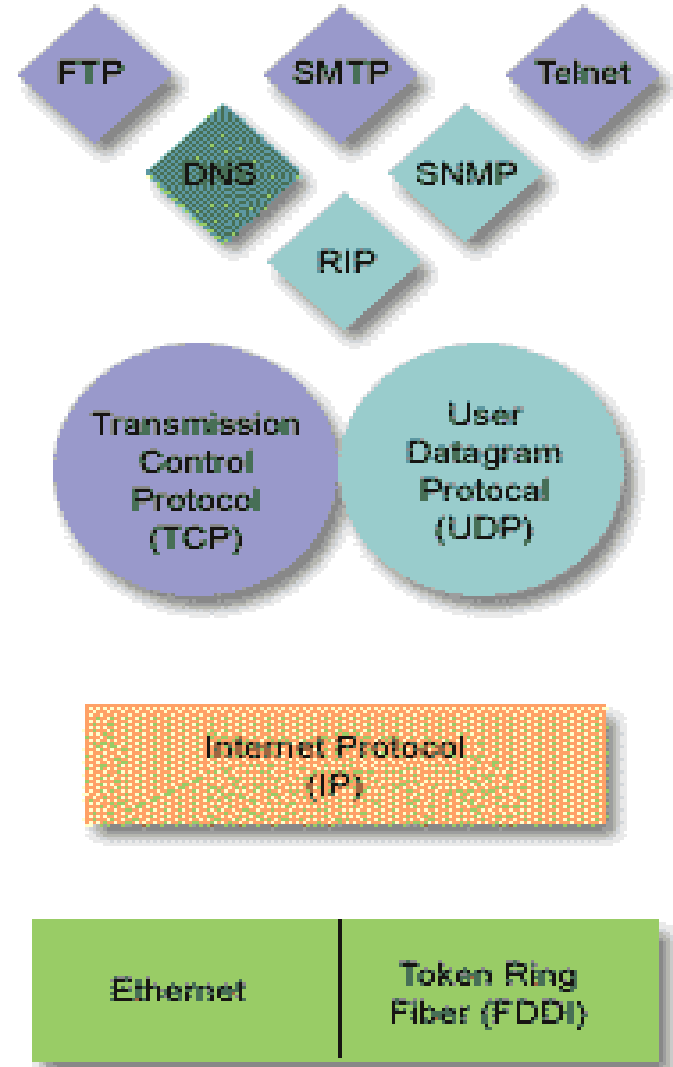
OSI model



TCP/IP model



TPC/IP architectural model



Host (your laptop)



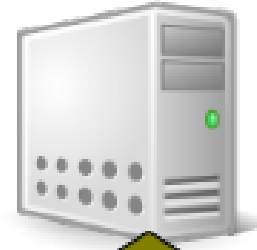
Application Layer (HTTP)

Transport Layer (TCP)

Network Layer (IP)

Data Link Layer

Target (webserver)



Application Layer (HTTP)

Transport Layer (TCP)

Network Layer (IP)

Data Link Layer

Media for data transfer (e.g. Ethernet)



APPLICATION

- This layer is comparable to the application, presentation, and session layers of the OSI model all combined into one.
- It provides a way for applications to have access to networked services.
- This layer also contains the high level protocols. The main issue with this layer is the ability to use both TCP and UDP protocols.

TRANSPORT

- This layer acts as the delivery service used by the application layer.
- Again the two protocols used are TCP and UDP.
- The choice is made based on the application's transmission reliability requirements.
- The transport layer also handles all error detection and recovery.

INTERNET

- This layer is also known as Internet layer. The main purpose of this layer is to organize or handle the movement of data on network.
- By movement of data, we generally mean routing of data over the network. The main protocol used at this layer is IP. While ICMP(used by popular ‘ping’ command) and IGMP are also used at this layer.

NETWORK INTERFACE

- This layer is also known as network interface layer
- This layer normally consists of device drivers in the OS and the network interface card attached to the system.
- Both the device drivers and the network interface card take care of the communication details with the media being used to transfer the data over the network.

Internet Protocol Applications

- **Hyper Text Transfer Protocol (HTTP)**
 - HTTP is a communication protocol. It defines mechanism for communication between browser and the web server.
- **Telnet**
 - Telnet is a protocol used to log in to remote computer on the internet
- **Trivial File Transfer Protocol (TFTP)**
 - transfer the files but it transfers the files without authentication or security
 - TFTP makes use of UDP
- **File Transfer Protocol (FTP)**
 - copy files from one host to another
 - Connections:one is for data transfer and other is for control information.

Contd.

- **User Datagram Protocol (UDP)**
 - UDP is connectionless and unreliable protocol
 - transmit small amount of data at one time
- **Transmission Control Protocol (TCP)**
 - connection oriented protocol and offers end-to-end packet delivery
 - Stream Data Transfer
 - Full Duplex Service
- **Internet Protocol (IP)**
 - Internet Protocol is connectionless and unreliable protocol
 - Internet protocol transmits the data in form of a datagram

Internet Organizations

Standards Development and Broad-based Advocacy and Educational Organizations

- IAB ([Internet Architecture Board](#))
- IANA ([Internet Assigned Numbers Authority](#))
- ICANN ([Internet Corporation for Assigned Names and Numbers](#))
- IESG ([Internet Engineering Steering Group](#))
- IETF ([Internet Engineering Task Force](#))
- IRTF ([Internet Research Task Force](#))
- ISOC ([Internet Society](#))
- NANOG ([North American Network Operators' Group](#))
- NRO ([Number Resource Organization](#))
- W3C ([World Wide Web Consortium](#))

Regional Internet Registries

RIR

- AfriNIC ([African Network Information Centre](#))
- ARIN ([American Registry for Internet Numbers](#))
- APNIC ([Asia-Pacific Network Information Centre](#))
- LACNIC ([Latin America and Caribbean Network Information Centre](#))
- RIPE ([Réseaux IP Européens Network Coordination Centre](#))

Accessibility and affordability initiatives

- [Internet.org](#)
- [Alliance for Affordable Internet](#)

Historical organizations

- [Advanced Network and Services](#) (ANS)
- [DARPA](#) (U.S. Defense Advanced Research Projects Agency)
- [InterNIC](#)
- [NSF](#) (U.S. National Science Foundation)
- [PSINet](#)
- [UUNet](#)

- Thank you