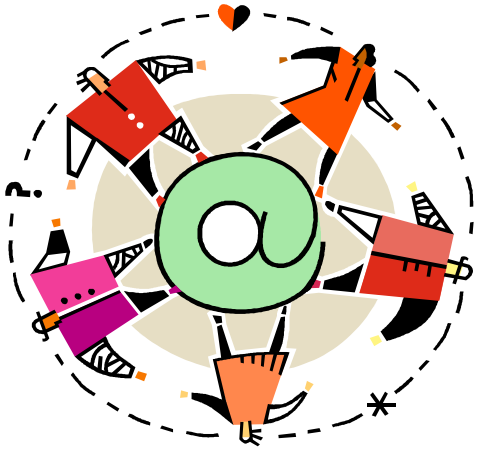
TOPIC 1

INTRODUCTION TO INTERNET & WORLD WIDE WEB



OBJECTIVES

- What is Network?
- What is Internet ?
- How does the Internet work ?
- What is World Wide Web ?
- How does the World Wide Web work ?

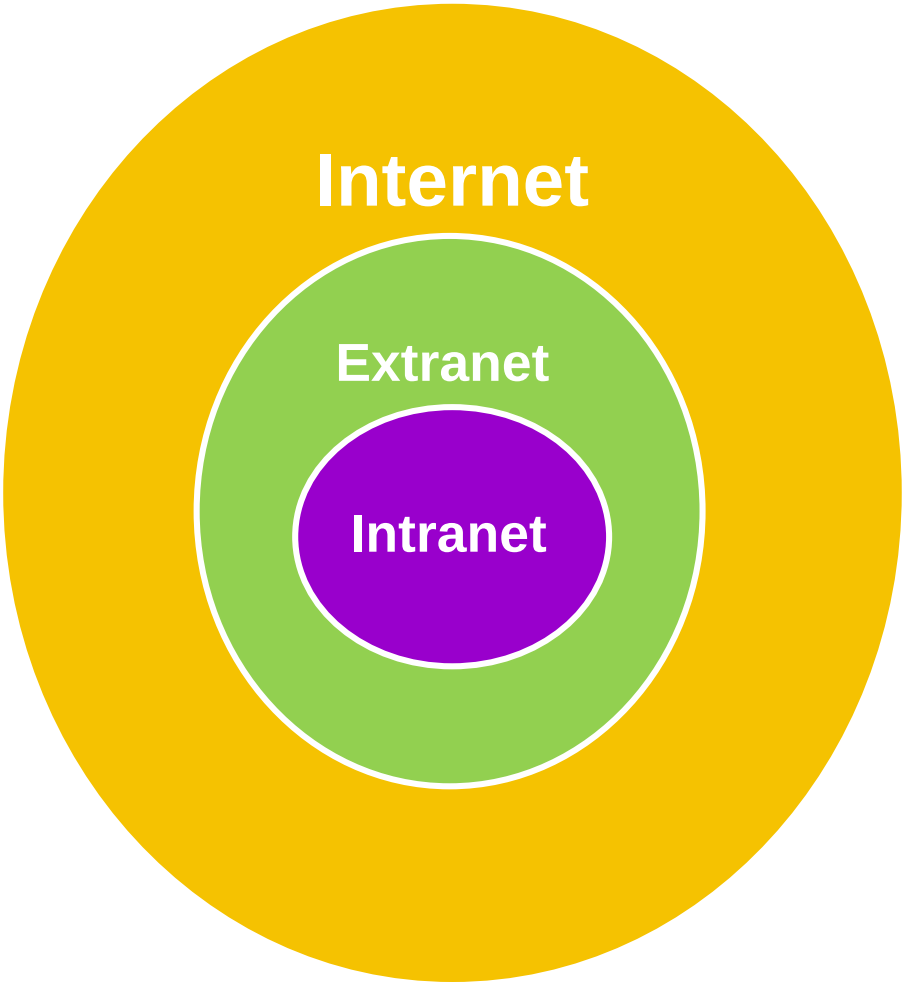
WHAT IS NETWORK?

- A **network** is a structure linking computers together for the purpose of sharing information and services
- Users typically access a network through a computer called a **node** or **host**
- A host that provides information or a service is called a **server**
- A computer or other device that receives a service is called a **client**
- One of the most commonly used designs is the **client-server network**

WHAT IS NETWORK?

- If the computers that make up a network are close together (within a single department or building), then the network is referred to as a **local area network (LAN)**
- A network that covers a wide area, such as several buildings or cities, is called a **wide area network (WAN)**
- The largest **WAN** in existence is the **Internet**

NETWORK TYPES AND PURPOSES



The World

Supplier, Customers, Collaborators

Within the Organisation

NETWORK TYPES AND PURPOSES

Table 1-1 Types of Web Sites

TYPE	USERS	ACCESS	APPLICATIONS
Internet	Anyone	Public	Share information (personal information, product catalogs, classroom information, etc.) with the public
Intranet	Employees or members of organization	Private	Share information (forms, manuals, schedules, etc.) with employees or members
Extranet	Select business partners or customers	Private	Share information (inventory updates, product specifications, financial information, etc.) with partners and customers

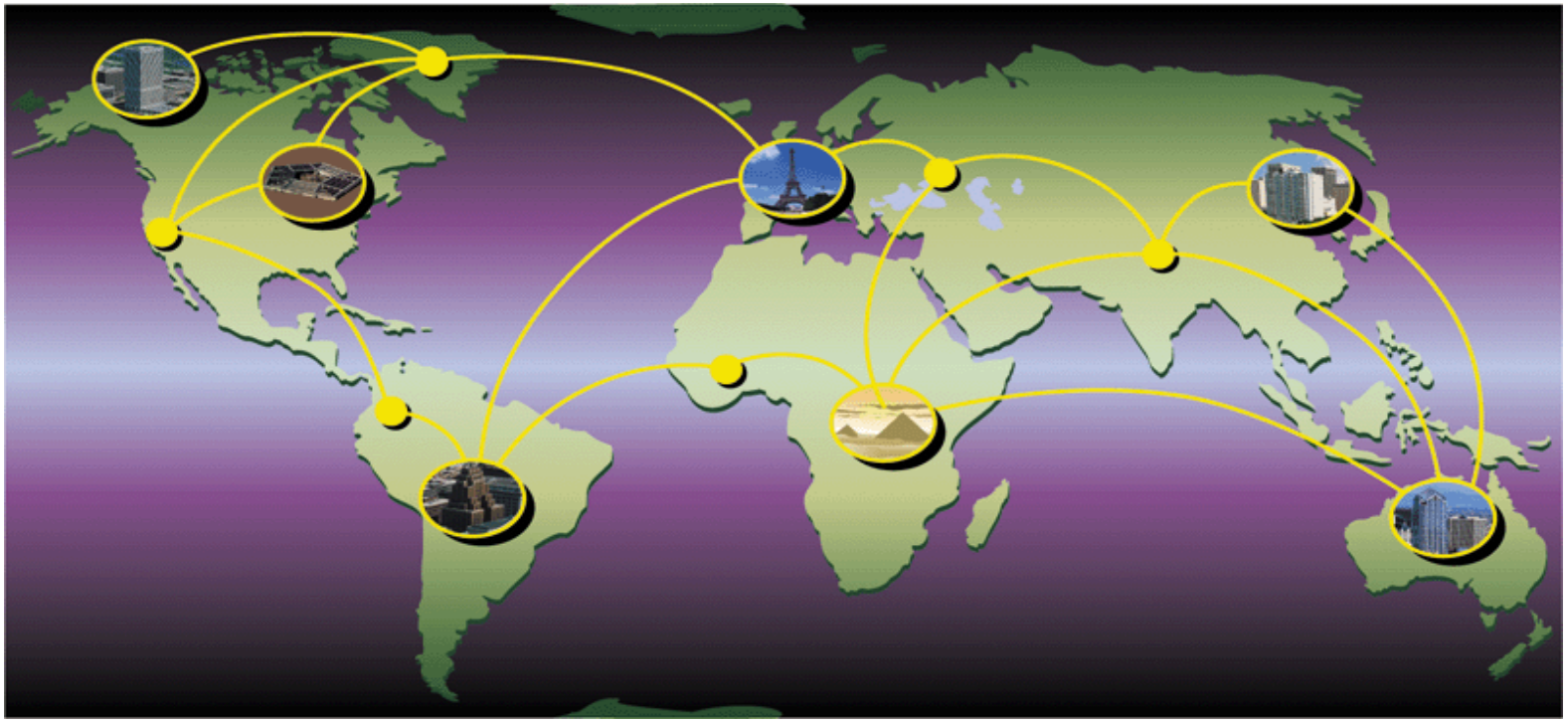
WHAT IS INTERNET?

- **I**nternet is a global network connecting millions of computers
- Internet consists of many computers of different makes, models, operating systems (such as Windows, Macintosh, Linux, etc)
- It reaches government, commercial, and educational organisations around the world
- It reaches the homes of millions of individuals world-wide

WHAT IS INTERNET?

- Who controls the Internet?
  - No one—it is a public, cooperative, and independent network
- World Wide Web Consortium (W3C)
  - Oversees research, sets standards and guidelines
  - Mission is to contribute to the growth of the Web
  - Nearly 400 organizations from around the world are members of W3C

WHAT IS INTERNET?



Today the Internet has grown to include an uncountable number of networks and hosts involving computers, mobile phones, PDAs, MP3 players, gaming systems, and television stations

INTERNET SERVICES

- **Electronic Mail (EMAIL)**
  - A service that permits people to send messages to one another on the Internet
- **Newsgroups (NEWS)**
  - A service which permits one person to post a message for others to read on the Internet
- **Chat and Instant Messaging (IRC, ICQ, Windows Live Messenger, etc.)**
  - Allows people to chat with each other on the internet

INTERNET SERVICES

- **File Transfer (FTP)**
  - Used for putting or getting files from a host computer on the Internet
- **Remote Login (TELNET)**
  - Allows a user to login and interact with a remote computer on the Internet
- **World Wide Web (WWW)**
  - Allows people to ‘surf’ the Internet and retrieve all kinds of information

HOW DOES INTERNET WORK ?

- The communication protocol used by internet is called **Transmission Control Protocol/Internet Protocol(TCP/IP)**
- TCP - how data is broken up into packets and reassembled at the end
- IP - how packets reach their destination

TCP/IP

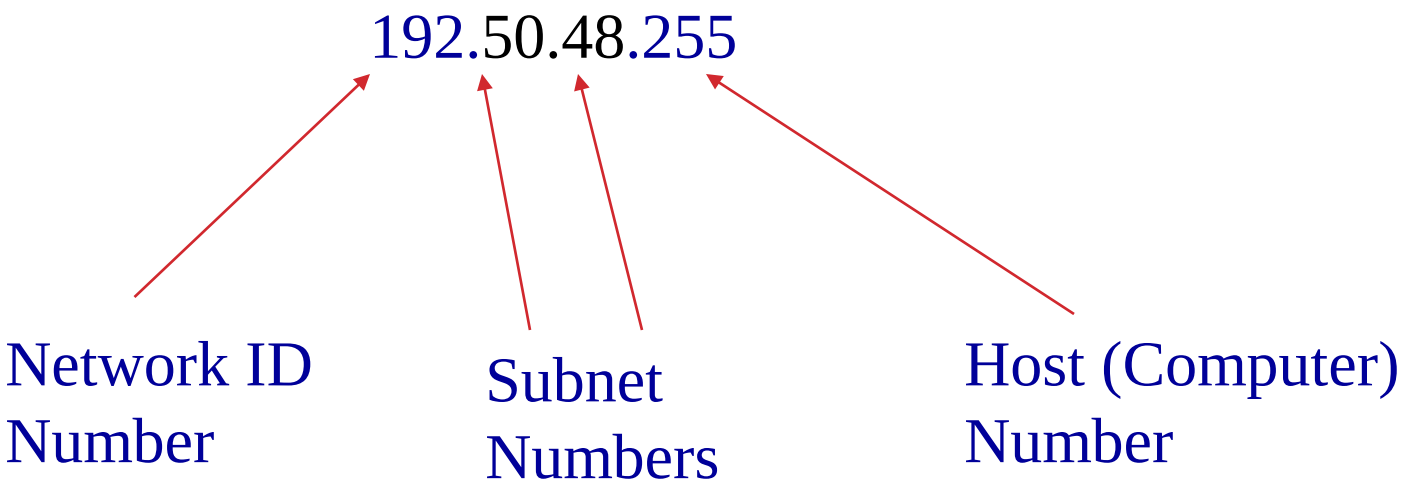
- All computers that connect to the Internet must use the ***TCP/IP* protocol** (language)
  - A protocol is a **set of rules** that two or more computers must follow to exchange messages
  - This protocol is known as Transmission Control Protocol/Internet Protocol (TCP/IP)
  - It describes the format of the data that can be sent, and the way a computer should respond to each message

IP ADDRESS

- Every computer that connects to the Internet must have a **unique address** – like our home address or telephone number
- This address is called the IP address (Internet Protocol address)
- An IP address consists of four numbers separated by periods
- Each of these four numbers range from 0 to 255

IP ADDRESS

- Example of an IP address:



IP ADDRESS

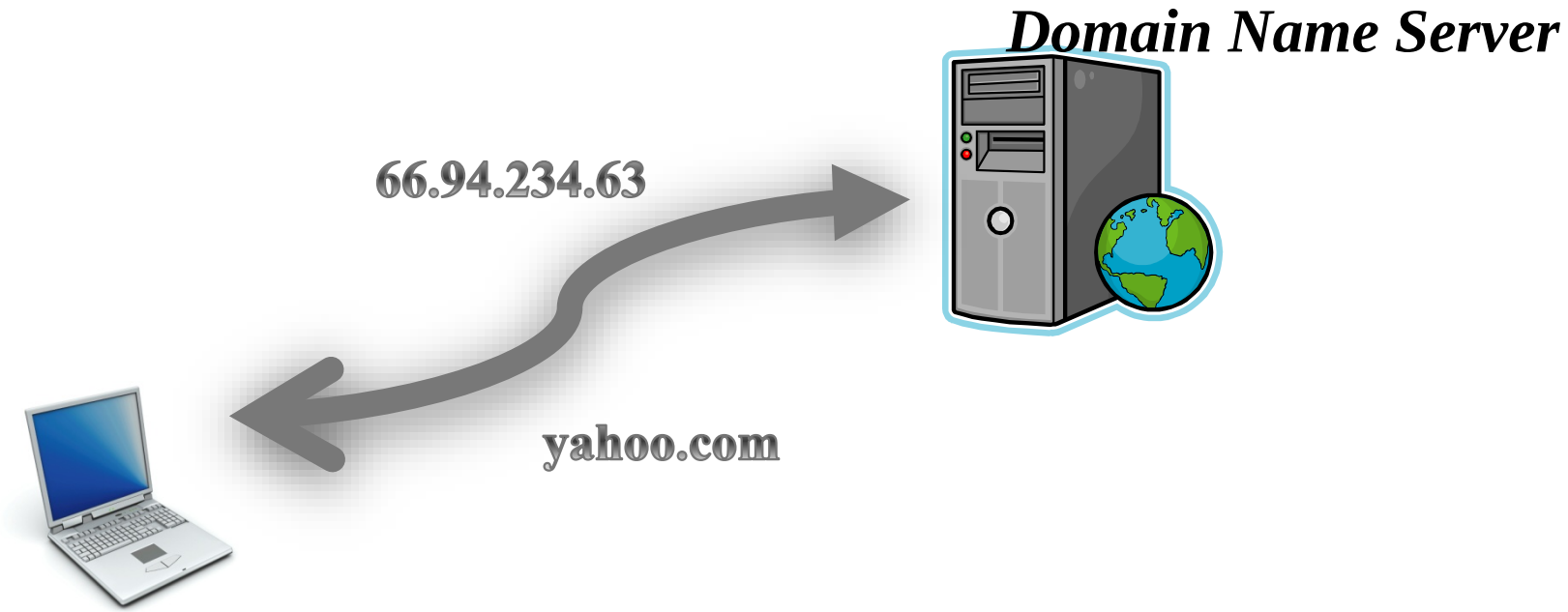
- Problem with IP address:
  - Difficult to remember

- To resolve this problem:
  - **Domain Name Service(DNS)** was introduced

DOMAIN NAME SERVICE

- IP addresses are fine for computers, but difficult to remember for humans
- To solve this problem, we have the Domain Name Service (DNS), a network service that **maps human readable names to IP addresses**
- Example:
  - www.nyp.edu.sg -> NYP's website
  - 202.12.95.15 -> IP address
  - When you type http://www.nyp.edu.sg in your Web browser, the DNS will convert it to 202.12.95.15

DOMAIN NAME SERVICE



a network service that maps domain names to IP addresses

DOMAIN NAME SERVICE

- Domain names are categorized:
  - .com = commercial organizations (e.g. www.microsoft.com)
  - .edu = educational institutions; universities, etc (e.g. www.standford.edu)
  - .net = network resources organizations (e.g. www.cobweb.net)
  - .org = other non-profit making organizations (e.g. www.w3c.org)
  - .edu.sg = sg is the country code for Singapore (www.nyp.edu.sg)

- Reference: http://www.sgnic.org/ for DNS Information

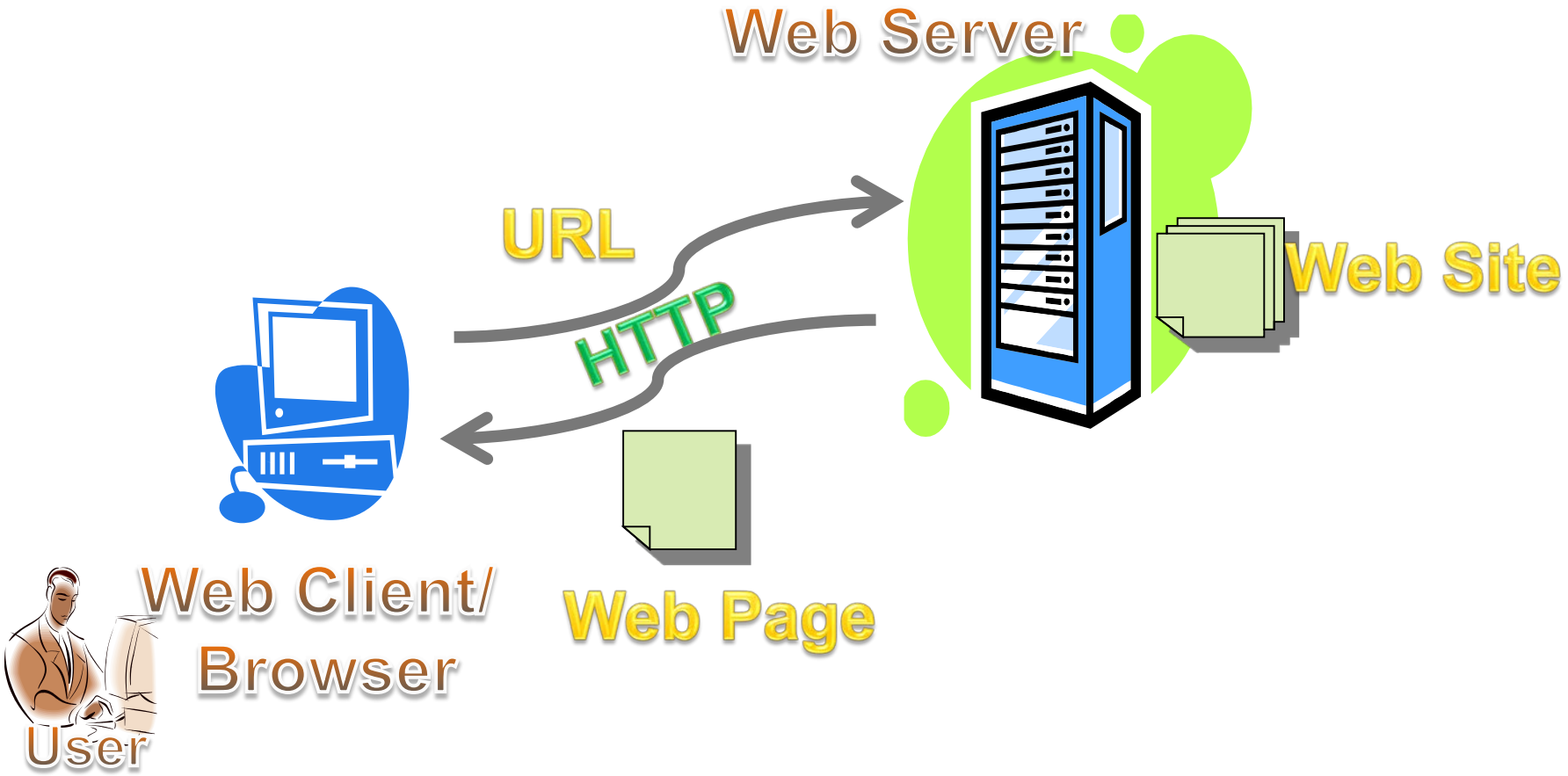
WHAT IS WORLD WIDE WEB?

- The World Wide Web, also called “the Web,” is an **Internet service** that supports multimedia and consists of a **collection of linked documents**
- Each document (a page of information) on the World Wide Web is referred to as a **Web Page**
- A **Web Site** is a collection of related web pages
- Web Pages are stored on **Web Servers,** which are computers that make Web pages available to any device connected to the Internet

WHAT IS WORLD WIDE WEB?

- Users use a **Web Client** (computers or other devices) to access the Web
- The Web Client and Web Server communicates using the **HTTP** protocol (language)
- The Web Client sends a **URL** request (address of the web page) to the Web Server to retrieve the web page
- The **Web Browser** is the software application running on the Web Client that interprets and display the Web Page to the user

WHAT IS WORLD WIDE WEB?



WEB CLIENT

Web Client

User

Send request to the web server for information. The piece of software used is called web browser.

WEB BROWSER

- A Web browser is a client program that **interprets** and **displays** Web pages and enables you to view and interact with a Web page

- Microsoft Internet Explorer, Google Chrome, Mozilla Firefox are popular Web browsers in use today.

WEB BROWSER

A software application that interpret and display the web information to the users

HTTP

- **H**yper**t**ext **T**ransfer **P**rotocol (HTTP) is a **set of rules** for exchanging text, graphics, sound, and other multimedia files between the Web Server and Web Client

- Just as TCP/IP allows computers to exchange information over the Internet, HTTP allows Web browser clients to exchange information with Web servers.

URL

- A **U**niform **R**esource **L**ocator (URL) is the address of a document or other file accessible on the Internet

- A URL contains the following:
  - Name of the protocol used to access the resource (e.g. http)
  - Domain name (e.g. www.nyp.edu.sg)
  - A directory/file location on the computer (optional, e.g. home.htm)

URL

A unique address for a web page. The address indicates the protocol , domain name , *path and the name of web page(optional)*

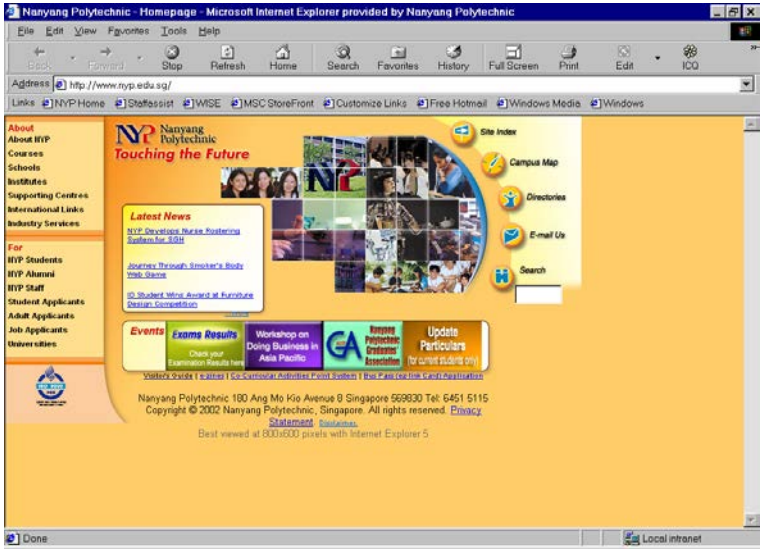
URL

- Example 1: URL to display a homepage:

Use HTTP Protocol

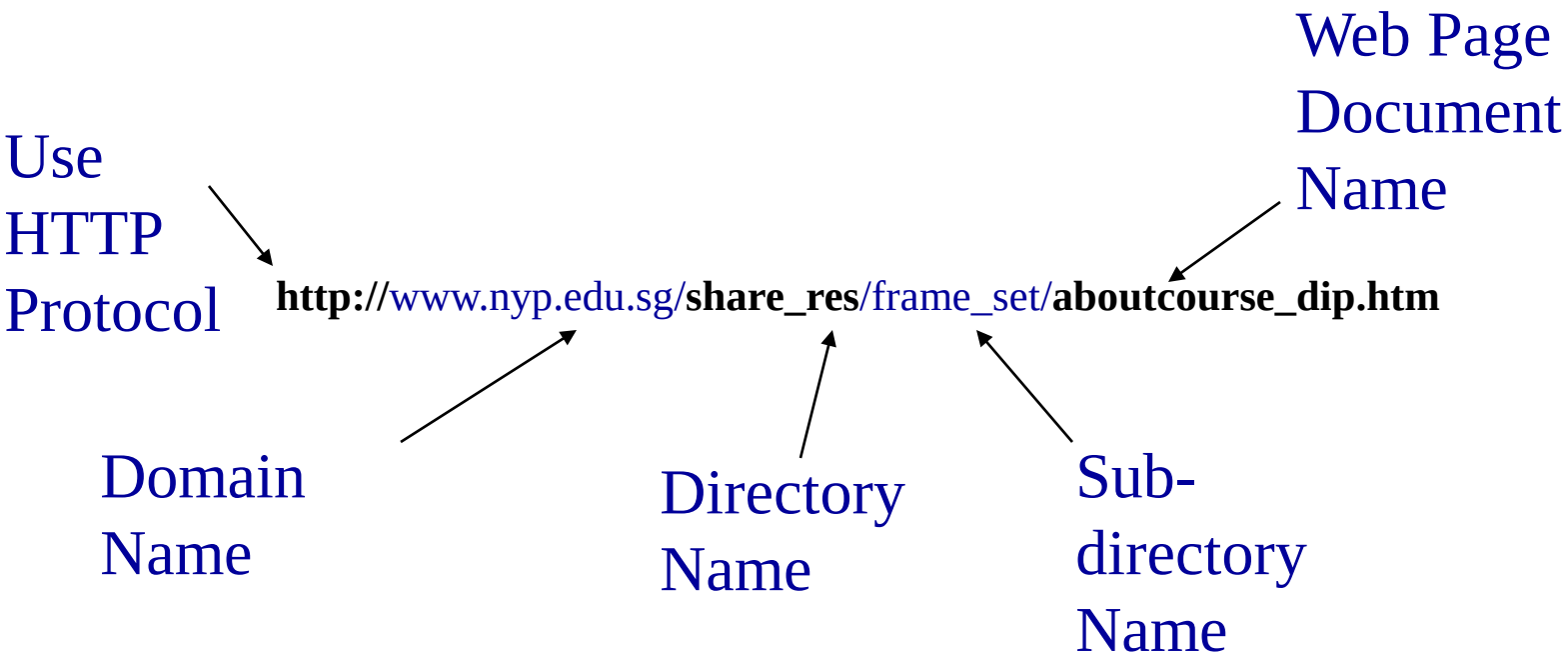
http://www.nyp.edu.sg/

Domain Name



URL

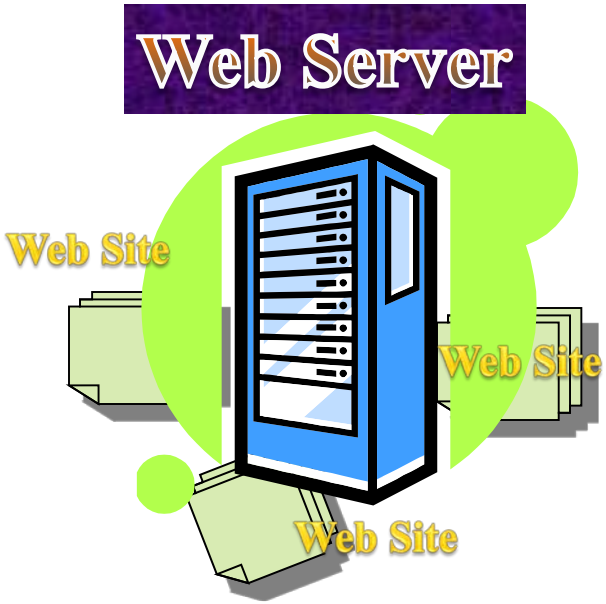
- Example 2: URL to display a specific Web page:



WEB SERVER

- Web pages are stored on a Web server, or host, which is a **computer that stores and sends (serves) requested Web pages and other files**
- Publishing a Web site means to copy Web pages and other files to a Web server
- Two of the most popular Web servers in use today:
  - Apache Tomcat, an open source (free) Web server for both Windows and UNIX-based operating systems
  - Microsoft's Internet Information Server (IIS)

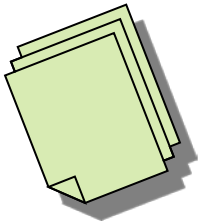
WEB SERVER



Listening to the request from web clients

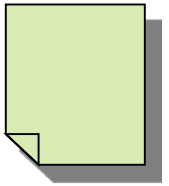
1. Get and process the request
2. Find the resource
3. Response to the clients

WEB SITE



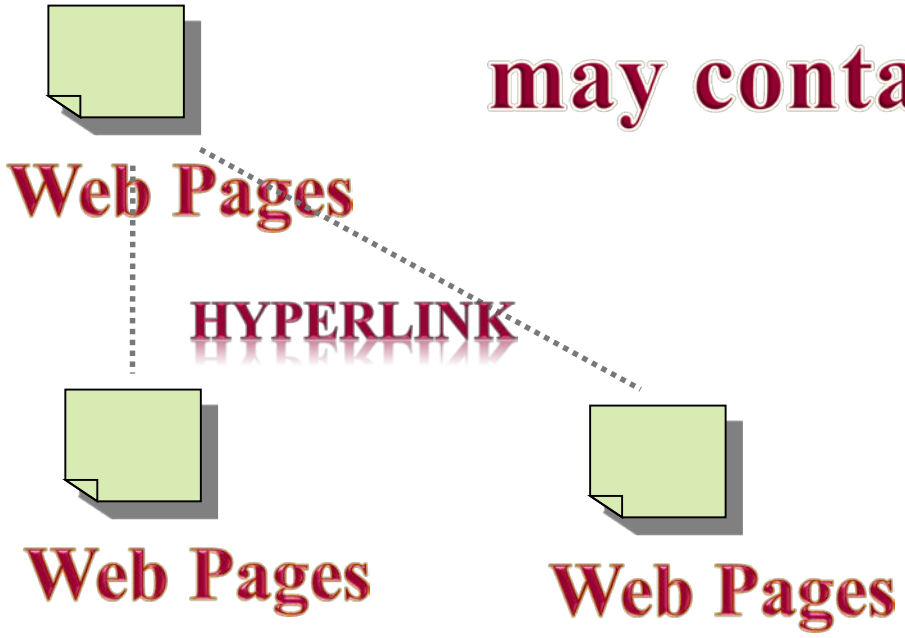
Web Site

Is a collection of

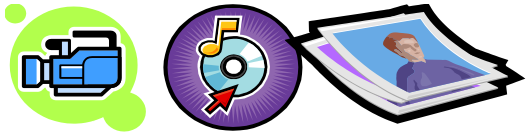


Web Pages

WEB PAGE



HTML
CSS
JAVASCRIPT



example1.htm - Notepad

File Edit Format View Help

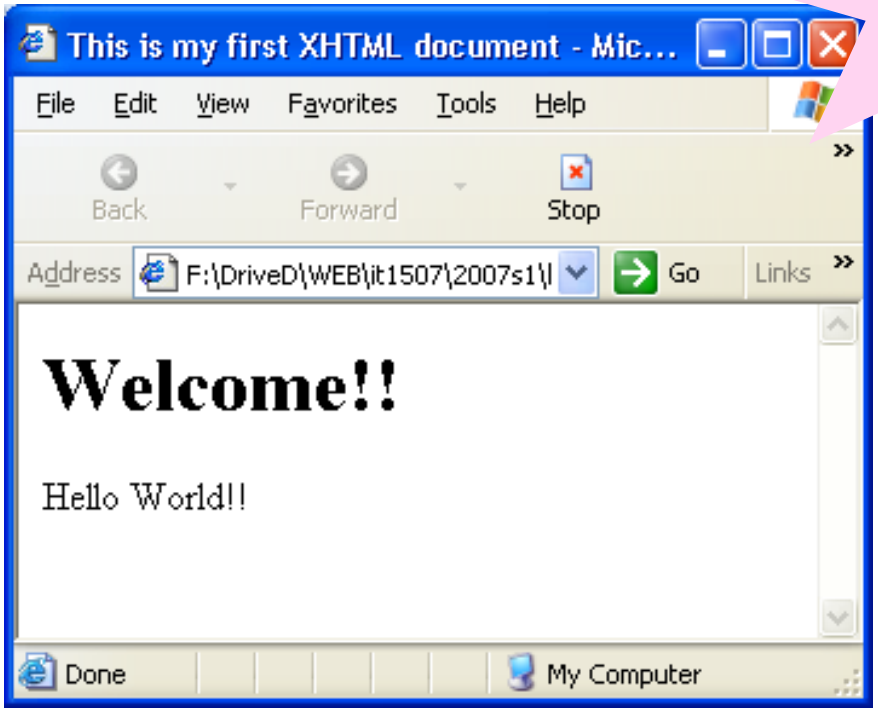
```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
 "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<html>
  <head>
     <title> This is my first XHTML document </title>
  </head>
  <body>
     <!-- this line will not be displayed as it is within the comme
     <div>
        <h1>Welcome!!</h1>
        <p>Hello World!!</p>
     </div>
  </body>
</html>
```

WEB PAGE

Web browser interprets and displays



HTML

- A Web page is a text file written in **H**yper**t**ext **M**arkup **L**anguage (HTML)

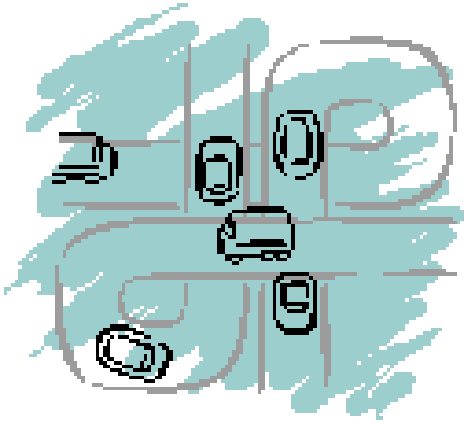
- A **markup language** is a language that describes the content and structure of a document by identifying, or tagging, different elements in the document

CSS STYLE SHEET

- HTML marks the different parts of a document, but it does not indicate how document content should be displayed by browsers

- For this reason, the exact **appearance** of each page element is described in a document known as a **style sheet**

SUMMARY



Internet is the information highway

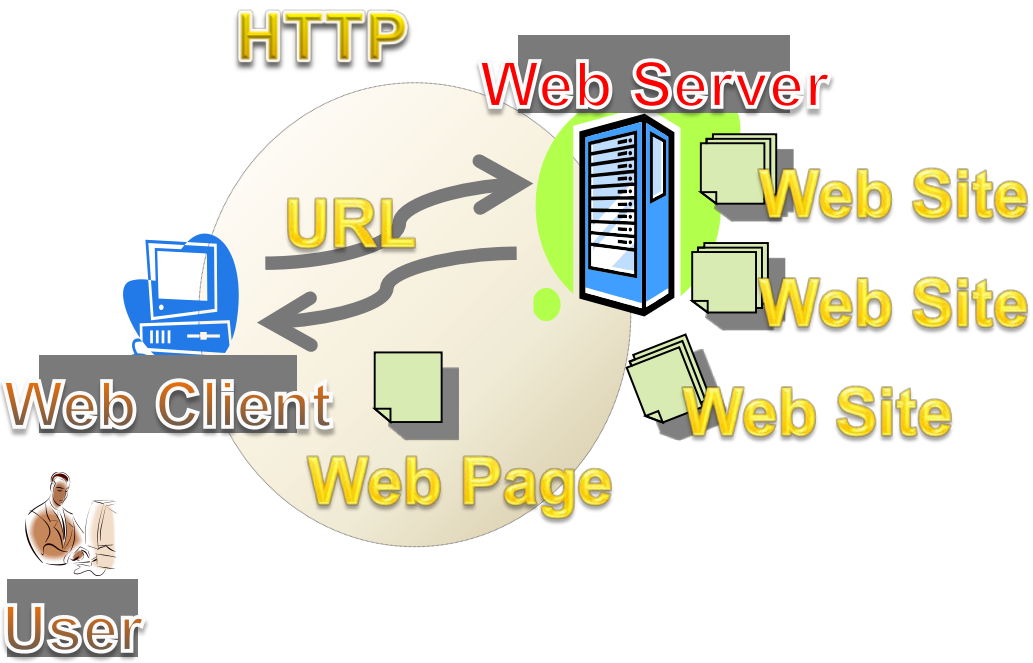
Internet protocol: TCP/IP

Nodes in Internet can be uniquely identified using IP address (e.g. 200.2.16.20), domain name(nyp.gov.sg)

W3C setting standard for Internet

There are many services run on the Internet such as email, ftp and www is one of these.

SUMMARY



World Wide Web is a service on top of Internet.

It consists of web clients and web servers.

Web servers and web clients communicate using HTTP.

Web servers holds web sites, web clients get web pages from web servers.

SUMMARY

Web browser interpret and display web pages