SNS COLLEGE OF ENGINEERING

Department of Information Technology

Course Name – 19IT401 Computer Networks

II Year / IV Semester

### Unit 5 – Application Layer

Topic 1 – WWW

WWW

WWW

- The idea of the Web was first proposed by Tim Berners-Lee in 1989 at CERN, European Council for Nuclear Research.

- The commercial Web started in the early 1990s.

- The Web today is a repository of information in which the documents, called web pages, are distributed all over the world and related documents are linked together.

- Web – Distributed and Linked

- The linking of web pages was achieved using a concept called hypertext, which was introduced many years before the advent of the Internet.

- Today, the term hypertext, coined to mean linked text documents, has been changed to hypermedia, to show that a web page can be a text document, an image, an audio file, or a video file.

WWW - Architecture

- The WWW today is a distributed client-server service, in which a client using a browser can access a service using a server.

- However, the service provided is distributed over many locations called sites. Each site holds one or more web pages.

- A simple web page has no links to other web pages; a composite web page has one or more links to other web pages. Each web page is a file with a name and address.
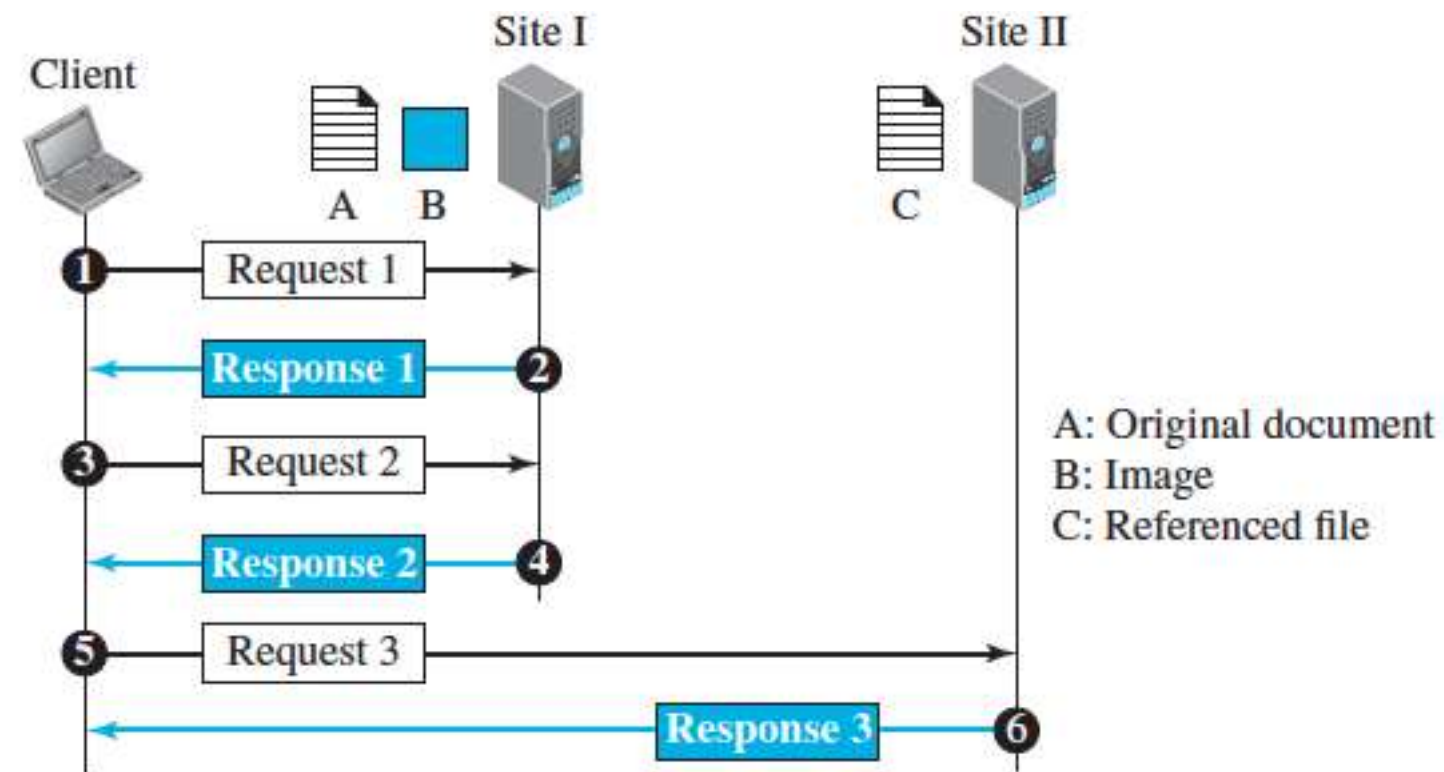
WWW - Architecture

Web Client (Browser)

- A variety of vendors offer commercial **browsers** that interpret and display a web page, and all of them use nearly the same architecture.

- Each browser usually consists of three parts: **a controller, client protocols, and interpreters**.
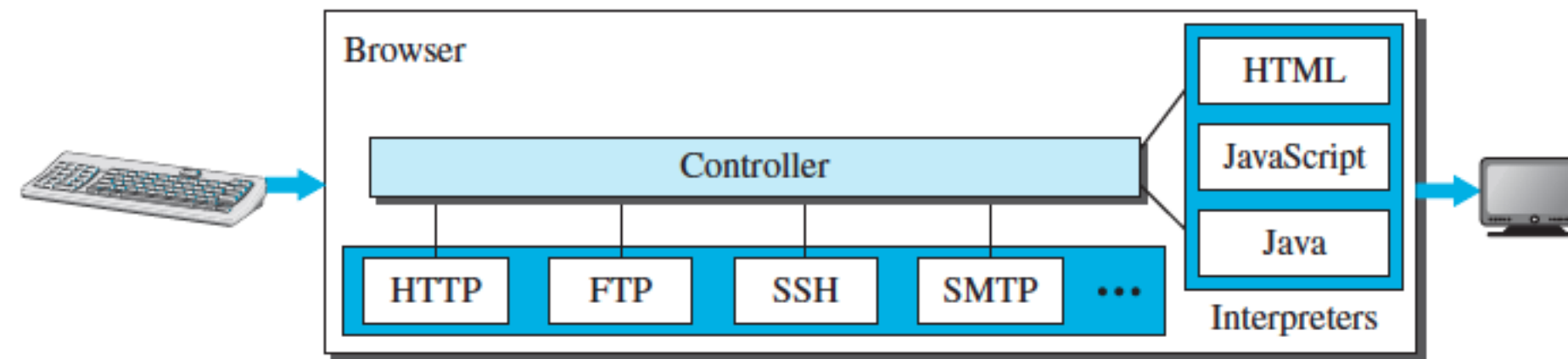
- The **controller** receives input from the keyboard or the mouse and uses the client programs to access the document.
- After the document has been accessed, the controller uses one of **the interpreters** to display the document on the screen.
- Some commercial browsers include Internet Explorer, Netscape Navigator, Firefox, Chrome, Safari.

WWW - Architecture

Web Server

- The web page is stored at the server.

- Each time a request arrives, the corresponding document is sent to the client.

- To improve efficiency, servers normally store requested files in a cache in memory; memory is faster to access than a disk.

- A server can also become more efficient through multithreading or multiprocessing.

- In this case, a server can answer more than one request at a time. Some popular web servers include Apache and Microsoft Internet Information Server.

Uniform Resource Locator (URL)

A web page, as a file, needs to have a unique identifier to distinguish it from other web pages.

To define a web page, we need four identifiers: **protocol, host, port, and path**.

- **Protocol** - The first identifier in client-server program is used to access the web page. Example – HTTP, FTP etc.

- **Host** - The host identifier can be the IP address of the server or the unique name given to the server.

- **Port** - The port, a 16-bit integer, is normally predefined for the client-server application. For example, if the HTTP protocol is used for accessing the web page, the well-known port number is 80.

- **Path -** The path identifies the location and the name of the file in the underlying operating system. For example, /top/next/last/myfile   is a path that uniquely defines a file named myfile, stored in the directory last. In other words, the path lists the directories from the top to the bottom, followed by the file name.

Uniform Resource Locator (URL)

To combine these four pieces together, the uniform resource locator (URL) has been designed;

protocol://host/path - Used most of the time
protocol://host:port/path - Used when port number is needed .

Example
URL - http://www.mhhe.com/compsci/forouzan

Web Documents

The documents in the WWW can be grouped into three broad categories: **static, dynamic, and active**.

Static Documents

- Static documents are fixed-content documents that are created and stored in a server. The client can get a copy of the document only.
- Static documents are prepared using one of several languages: Hyper Text Markup Language (HTML), Extensible Markup Language (XML), Extensible Style Language (XSL), and Extensible Hypertext Markup Language (XHTML).

Dynamic Documents

- A dynamic document is created by a web server whenever a browser requests the document. When a request arrives, the web server runs an application program or a script that creates the dynamic document.
- The server returns the result of the program or script as a response to the browser that requested the document.
- Scripting languages are used for retrieving a dynamic documents, examples include Java Server Pages (JSP), Active Server Pages (ASP), ColdFusion etc.
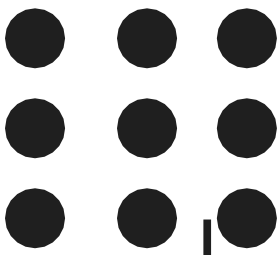
Web Documents

Active Documents

- For many applications, we need a program or a script to be run at the client site. These are called active documents.

- When a browser requests an active document, the server sends a copy of the document or a script. The document is then run at the client (browser) site.

- One way to create an active document is to use Java applets, run on Server.

- Another way is to use JavaScripts but download and run the script at the client site

THANK YOU