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Department of Information Technology

Course Name – 19IT401 Computer Networks

II Year / IV Semester

Unit 5 – Application Layer

Topic 1 – WWW





WWW

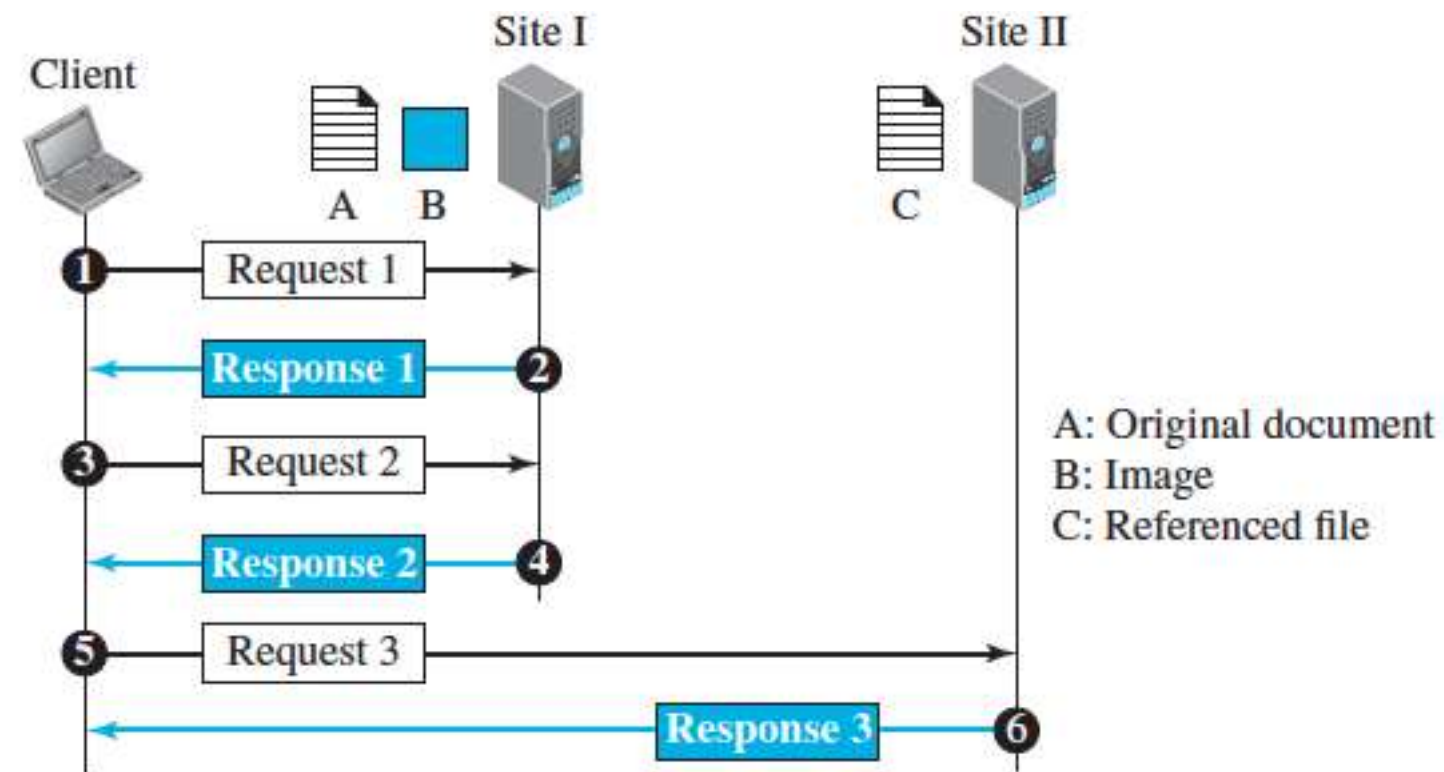


WWW

- 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

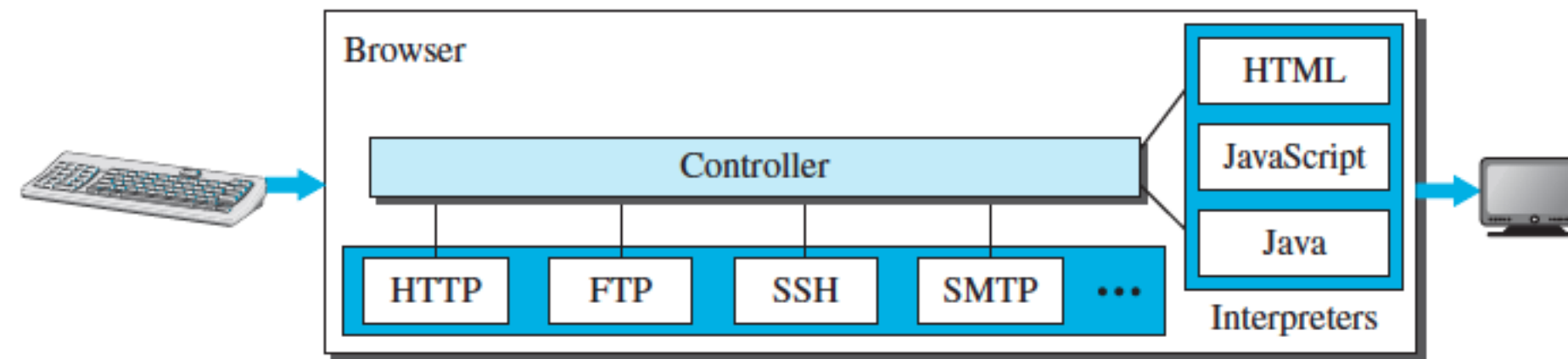
- The WWW today is a distributed client-server service, in which a client using a browser can access a service using a server.
- However, the service provided is distributed over many locations called sites. Each site holds one or more web pages.
- A simple web page has no links to other web pages; a 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.



WWW - URL

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.



WWW - URL

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>



WWW - URL

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.



WWW - URL

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