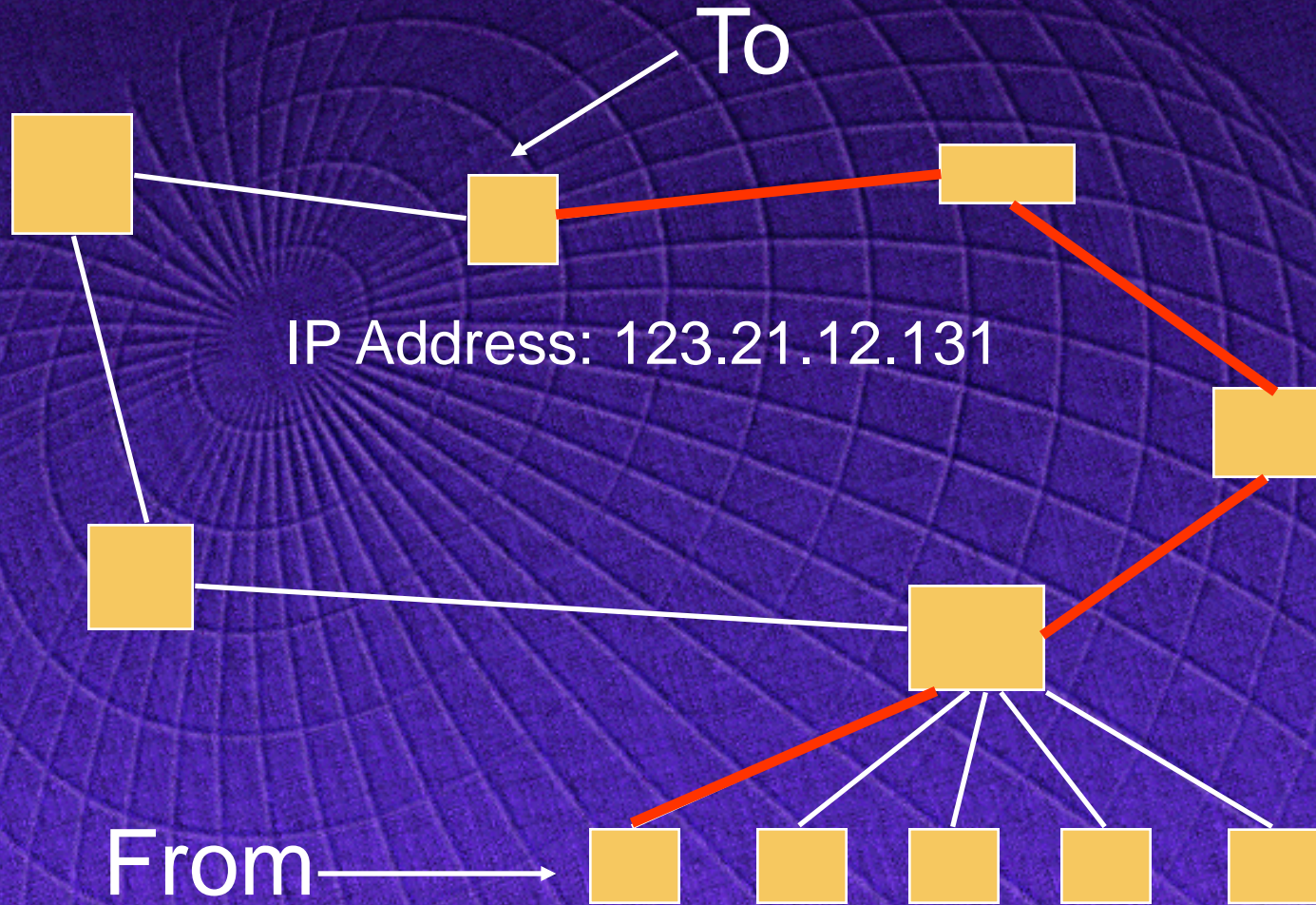


# The Internet





# The Internet

Worldwide collection of interconnected networks.

- ◆ Began in late '60s in ARPANET, a US project, investigating how to build networks that could withstand partial outages.
- ◆ Starting with a few nodes, Internet estimated to have over 100 million users in 1997, and over 270 million users in over 100 countries in 1998, with one million new users joining each month.



# Historical View: Internet

- ◆ 1969 - Telnet
- ◆ 1970 - 4 computers
  - Stanford, UCLA, UC Santa Barbara, U Utah
- ◆ 1971 - FTP
- ◆ 1983 - 562 computers on the internet
- ◆ 1993 - 1.2 million computers on the internet
- ◆ 1999 - .....



# Outline

- ◆ The Internet
- ◆ **The Web**
- ◆ What makes the Web work?
  - HTTP
  - URL
  - HTML
  - CGI
- ◆ Example of a Web page
- ◆ Summary



# The Web

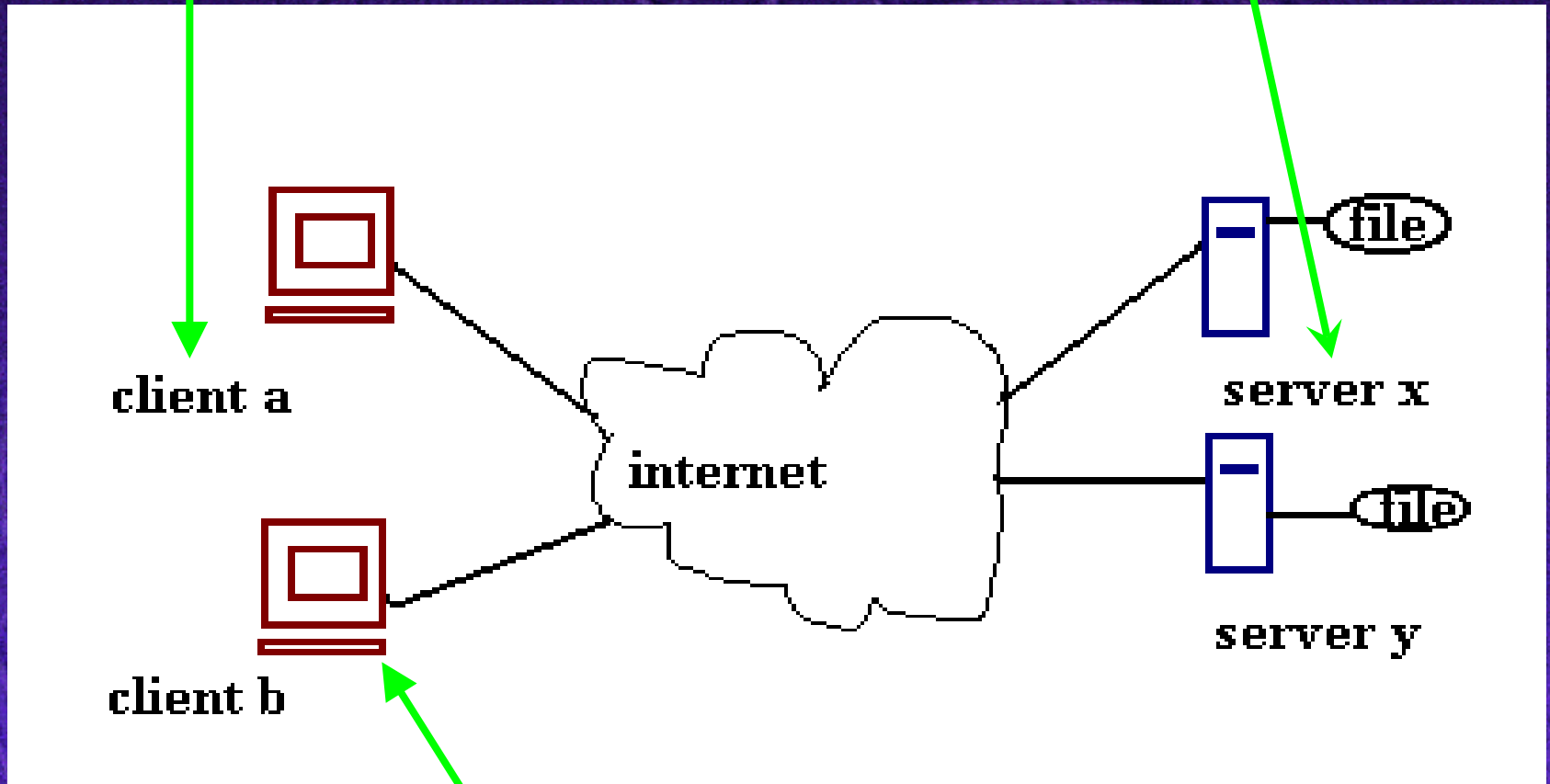
- ◆ World-Wide Web (Web, WWW)
  - networked information system that provides a simple way of browsing different types (text, pictures, video, audio, etc.) of information on the Internet using hyperlinks.
- ◆ Web pages
  - electronic documents that typically contains several types of information accessible via the World Wide Web
- ◆ Web sites
  - a collection of related Web pages of a certain individual, group, or organization.
- ◆ The Web uses a client/server model



# Client-Server Model

Browser - software to interact with internet data at the client

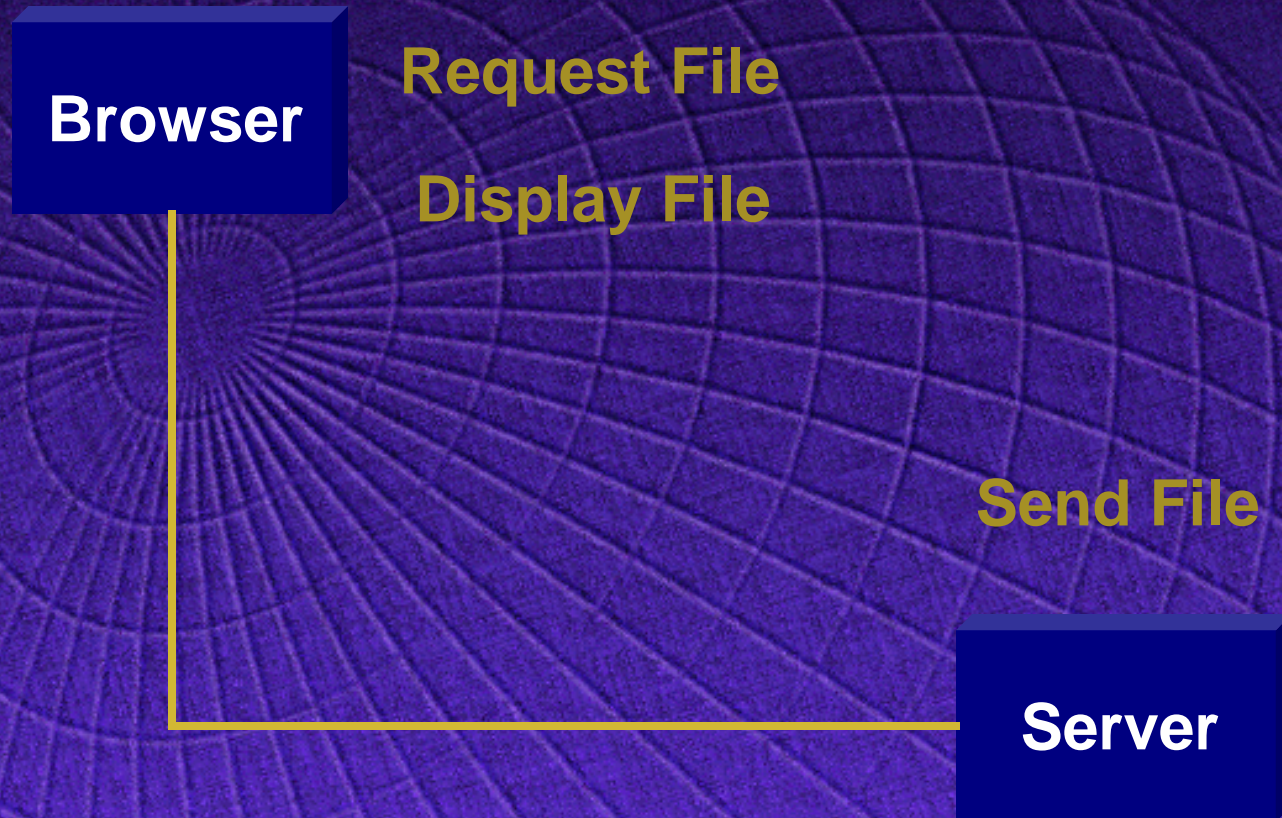
machine that services internet request



machine that initiates internet request



# Client/Server Interaction





# What is a Web Server?

## Web server

- ◆ computer running application software that listens and responds to a client computer's request made through a web browser
- ◆ machine that hosts web pages and other web documents
- ◆ provides web documents and other online services using HTTP



# What is a Web Browser?

## Web browser

- ◆ application software that is used to locate and issue a request for the page on the web server that hosts the document
- ◆ It also interpret the page sent back by the web server and display it on the monitor of the client computer
- ◆ computer program that lets you view and explore information on the World Wide Web



# Web Browsers



- ◆ **Microsoft Internet Explorer – browser integrated with the Windows operating system. Mac versions are available.**
- ◆ **Netscape Navigator - available for Windows, Mac, and Unix platforms.**
- ◆ **Opera – one of the alternatives to the two most popular browser mentioned above**
- ◆ **Mozilla – open source web browser software**
- ◆ **Lynx - popular Unix text-based browser**
- ◆ **Google Chrome is a Google browser that combines a minimal design with sophisticated technology.**





# Outline

- ◆ The Internet
- ◆ The Web
- ◆ **What makes the Web work?**
  - HTTP
  - URL
  - HTML
  - CGI .....
- ◆ Example of a Web page
- ◆ Summary



# What Makes the Web Work?

The Web relies on these mechanisms:

- ◆ Protocols - set of standards used to access resources via the Web
- ◆ Universal Resource Locator (URL) - uniform naming scheme for Internet resources
- ◆ HTML - Document formatting language used to design most Web pages
- ◆ CGI - Common Gateway Interface
- ◆ Servlet - Application run by a server connected to the WWW. It is one of the most popular avenues for Java development today.

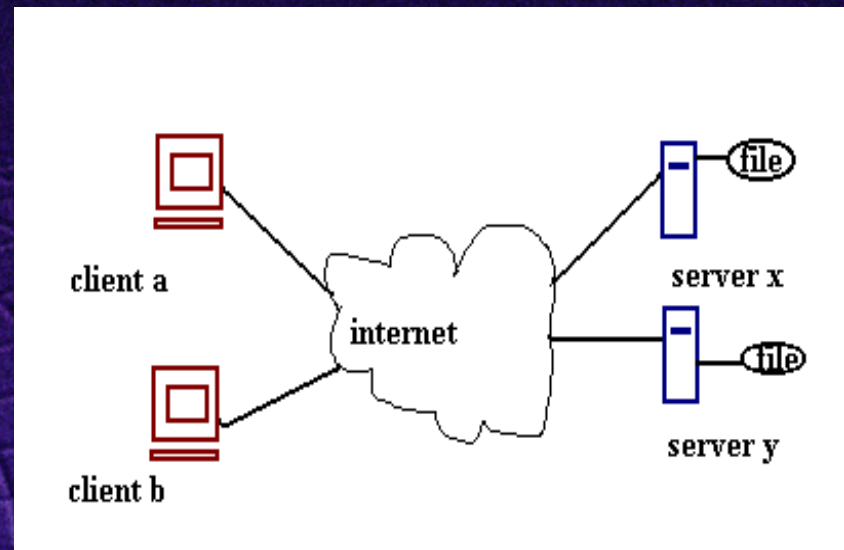


# Protocols

- ◆ Standard set of rules that governs how computers communicate with each other, i.e. HTTP, FTP and SMTP.
- ◆ HTTP (HyperText Transfer Protocol) is the underlying protocol used to transmit information over the Web.
- ◆ HTTP is based on request-response paradigm:
  - Connection: Client establishes connection with Web server.
  - Request: Client sends request to Web server.
  - Response: Web server sends response (HTML document) to client.
  - Close: Connection closed by Web server.



# HTTP Connection



- ◆ **1. Client**
  - makes an HTTP request for a web page
  - makes a TCP/IP connection
- ◆ **2. Server accepts request**
  - sends page as HTTP
- ◆ **3. Client downloads page**
- ◆ **4. Server breaks the connection**



# Uniform Resource Locators (URLs)

- ◆ Identifies the file to request
  - Specifies server and file
  - Defaults used for missing values



**Note: Not all URLs will have the directory and filename**





# HyperText Markup Language (HTML)

## ◆ Hypertext

- presents and relates information as hyperlinked documents that point to other documents or resources.

## ◆ HTML

- A standard markup language that defines a hypertext document.
- A simple, powerful, platform-independent document language.
- Specifies what displays should look like
- Browser interprets HTML
- Same HTML file often looks different across browsers
- HTML files are the source files of Web pages



# HTML File Structure

```
<HTML>  
<HEAD>  
<TITLE>Page Title</TITLE>  
</HEAD>  
<BODY>  
Stuff  
</BODY>  
</HTML>
```



# What About Graphics?

- ◆ An HTML file can refer to an image file

Here is a nice picture:  
<IMG SRC="stars.gif">



# What About Hyperlinks?

- ◆ An HTML file can refer to another HTML file

```
<h2>Teaching</h2>
```

```
<p><a href="http://ai.uwaterloo.ca/3421.html">  
COSC 3421 Fall 2002</a></p>
```

```
<p><a href="http://ai.uwaterloo.ca/3221.html">  
COSC 3221 Winter 2003</a></p>
```



# Simple Formatting

```
<H1><FONT COLOR="#b80000">
```

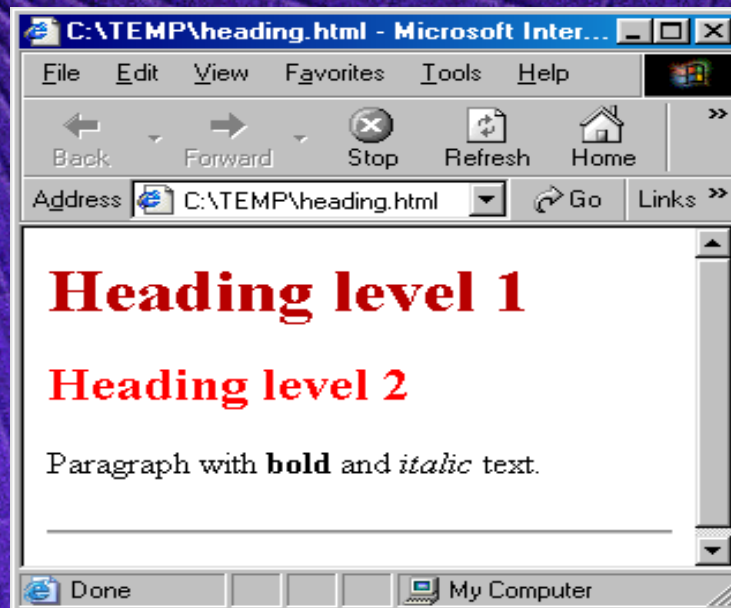
```
Heading level 1</FONT></H1>
```

```
<H2><FONT COLOR="#ff0000">
```

```
Heading level 2 </FONT> </H2>
```

```
<P>Paragraph with <B>bold</B> and  
<I>italic</I> text.</P>
```

```
<HR>
```



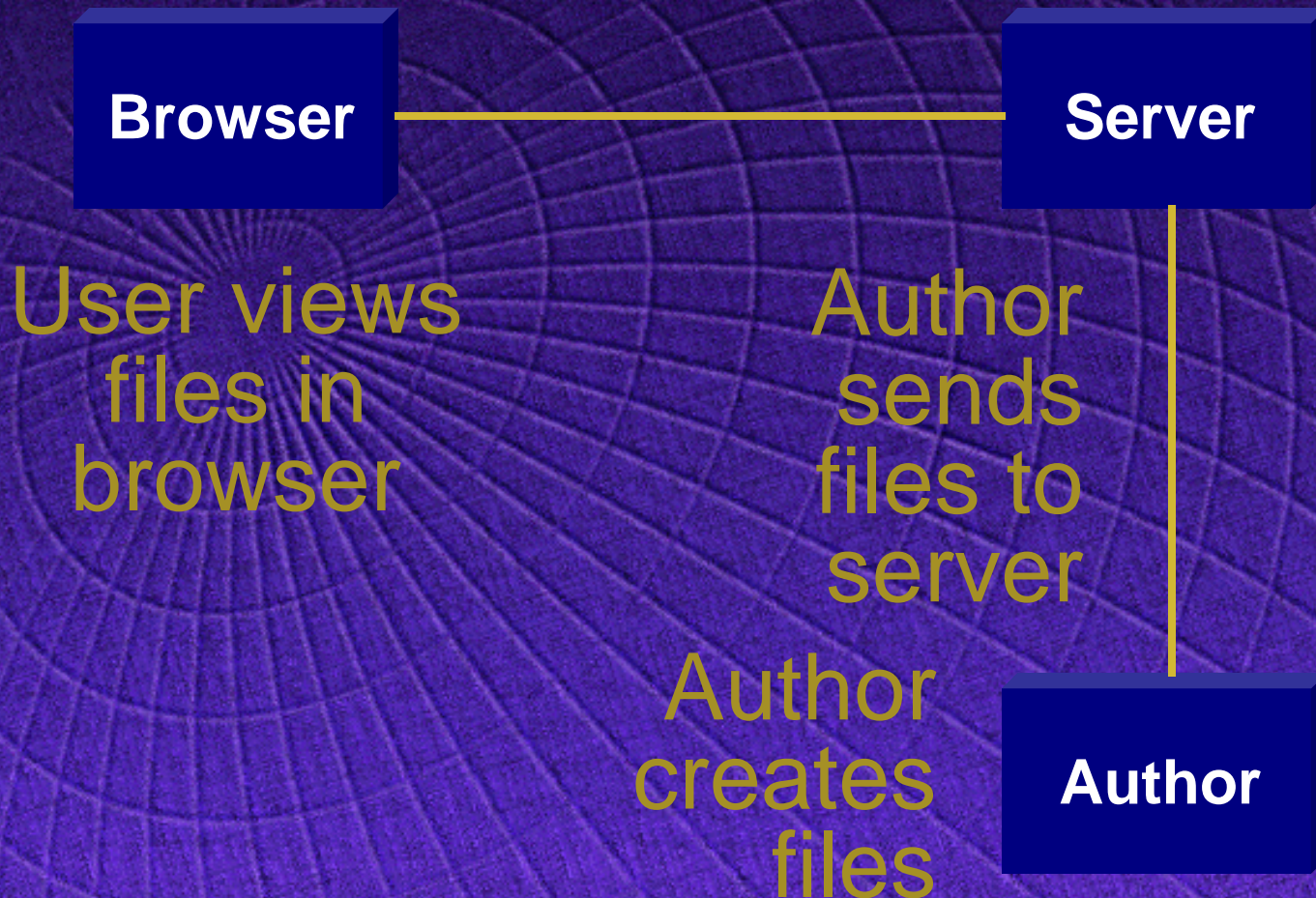


# Creating HTML Files

- ◆ Text editor (Notepad, Pico)
- ◆ HTML Editor (FrontPage, Netscape Gold and HoTMetaL)

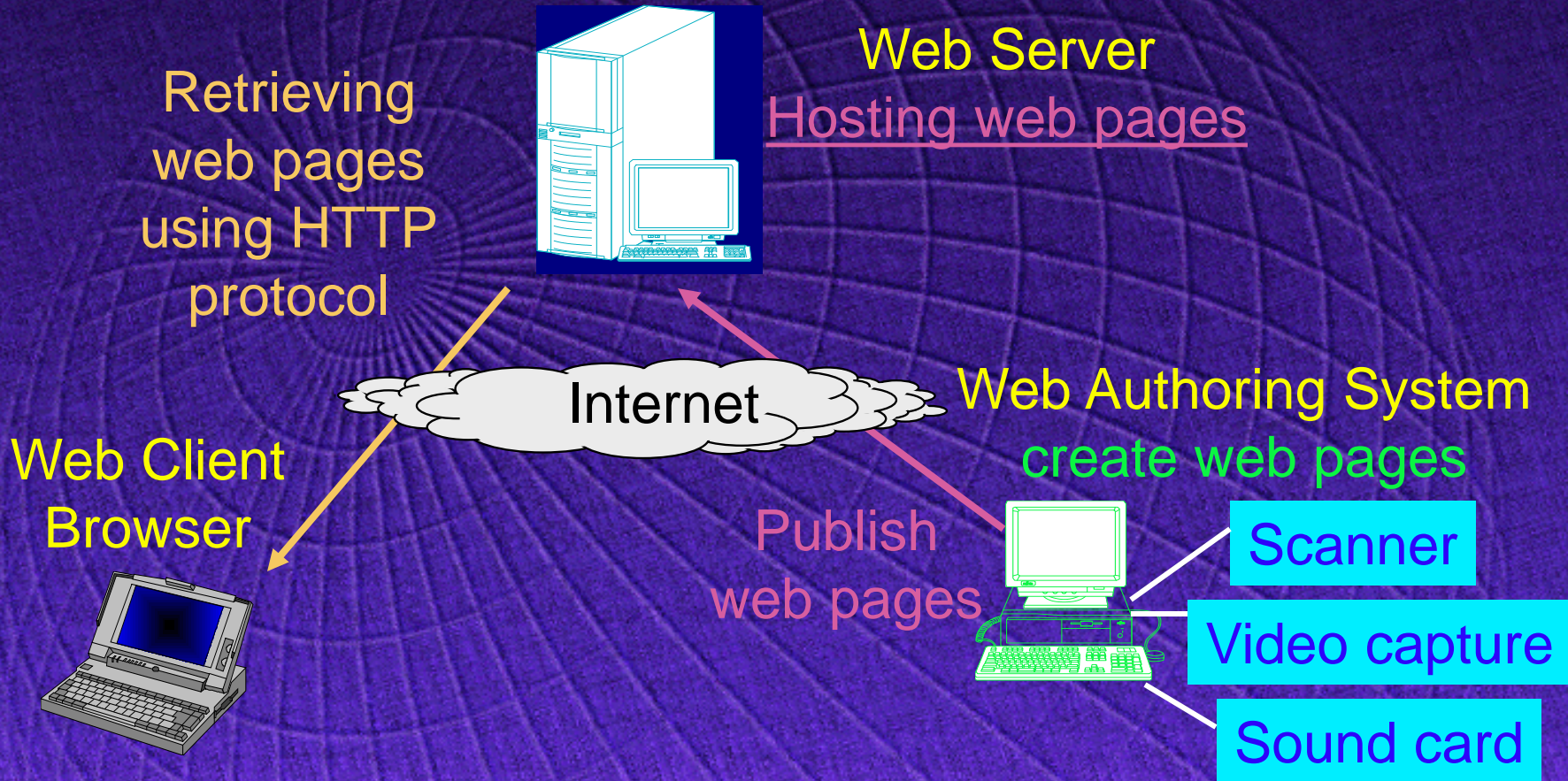


# Moving Files to Servers





# Introduction to Client-Server Systems



Web page: document written in HTML, JSP and ASP.



# Internet Client-Server Systems

Bing Maps - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://www.bing.com/maps/default.aspx?q=%22Dangji+Huang%22&kt=en-CANFORM=BYPD#3ndoZUM100nzAwk0tZwK1NDomVdCuyYytub3NbnRvJTJk09udGFyaW0mcM9e0AuWGHbmdqsR3dWfuZyU3Z7bdC4u31> Go

Google Search


Web Images Videos News Maps More Sympatico / MSN Windows Live Sign in Canada - (français) Extras

bing Business name or category ... Address, location, or landmark

Businesses Collections Locations

business results There are no business results for Dangji Huang in current map view [Modify search](#)

welcome directions collections options share print



20 30 Road Aerial Bird's eye Labels Traffic

Pin in any direction

York University

York Blvd

Vanier Ln

50 m

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Done Internet



# Internet Client-Server Systems

Bing Maps - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://www.bing.com/maps/default.aspx?q=%22Xiangji+Huang%22&mkt=en-CA&FORM=BYFD#JndoZXJlMT00NzAwK0tZwXk1N0cmVldCUyYytUb3JvbnRvJTJkO9udGFyaW8mc3M9eXAuWGhmdqaStIdWFuZyU3ZXNzdC4xJ1> Go Links >>


Google Search + Bookmarks ABC Check AutoFill DrJimm...

Web Images Videos News **Maps** More Sympatico / MSN Windows Live Sign in Canada (français) Extras

bing Business name or category ... Address, location, or landmark

Businesses Collections Locations

business results There are no business results for Xiangji Huang in current map view [Modify search](#) welcome directions collections options share print



W 2D 3D Road Aerial Bird's eye Labels Traffic <<

S N E Pan in any direction

Atkinson Rd Fine Arts Rd York Blvd York Blvd York Blvd

50 m

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Done Internet

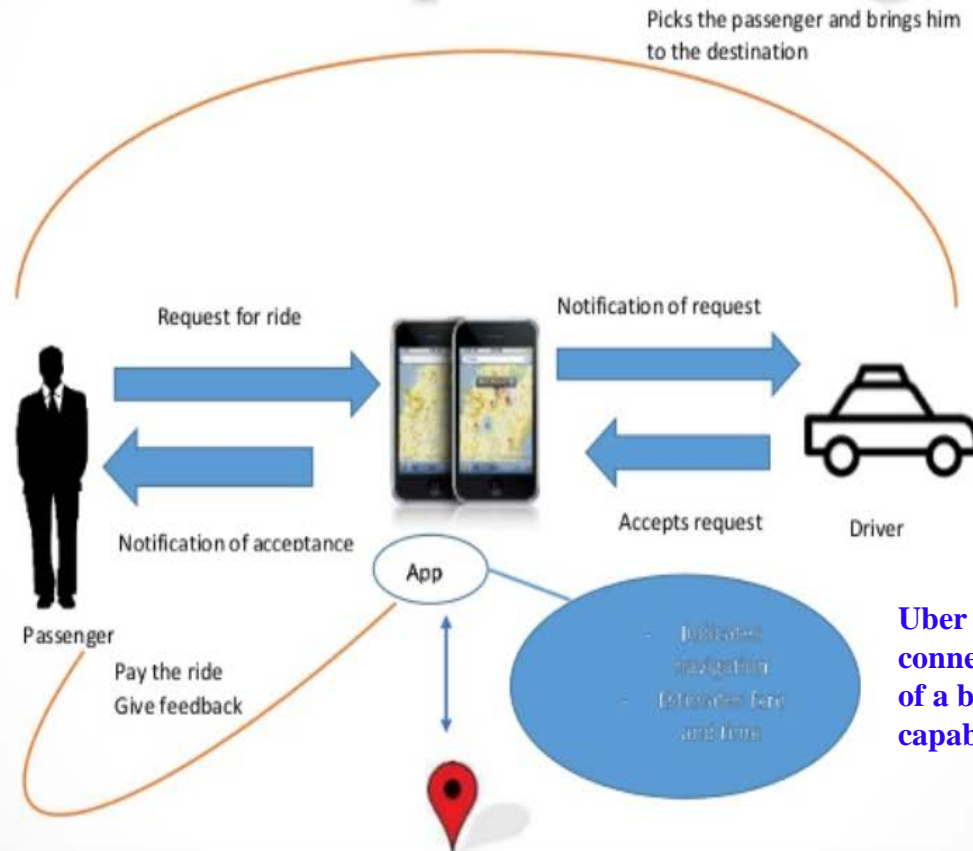


# Internet Client-Server Systems

Presentation2 - uber

Clip slide

## Order processing



Uber is an app and taxi service that connects riders and drivers with the tap of a button by using their phone's GPS capabilities



# Static and Dynamic Web Pages

- ◆ A static Web page is ready before it is accessed.
- ◆ The content of a dynamic Web page is generated each time it is accessed.

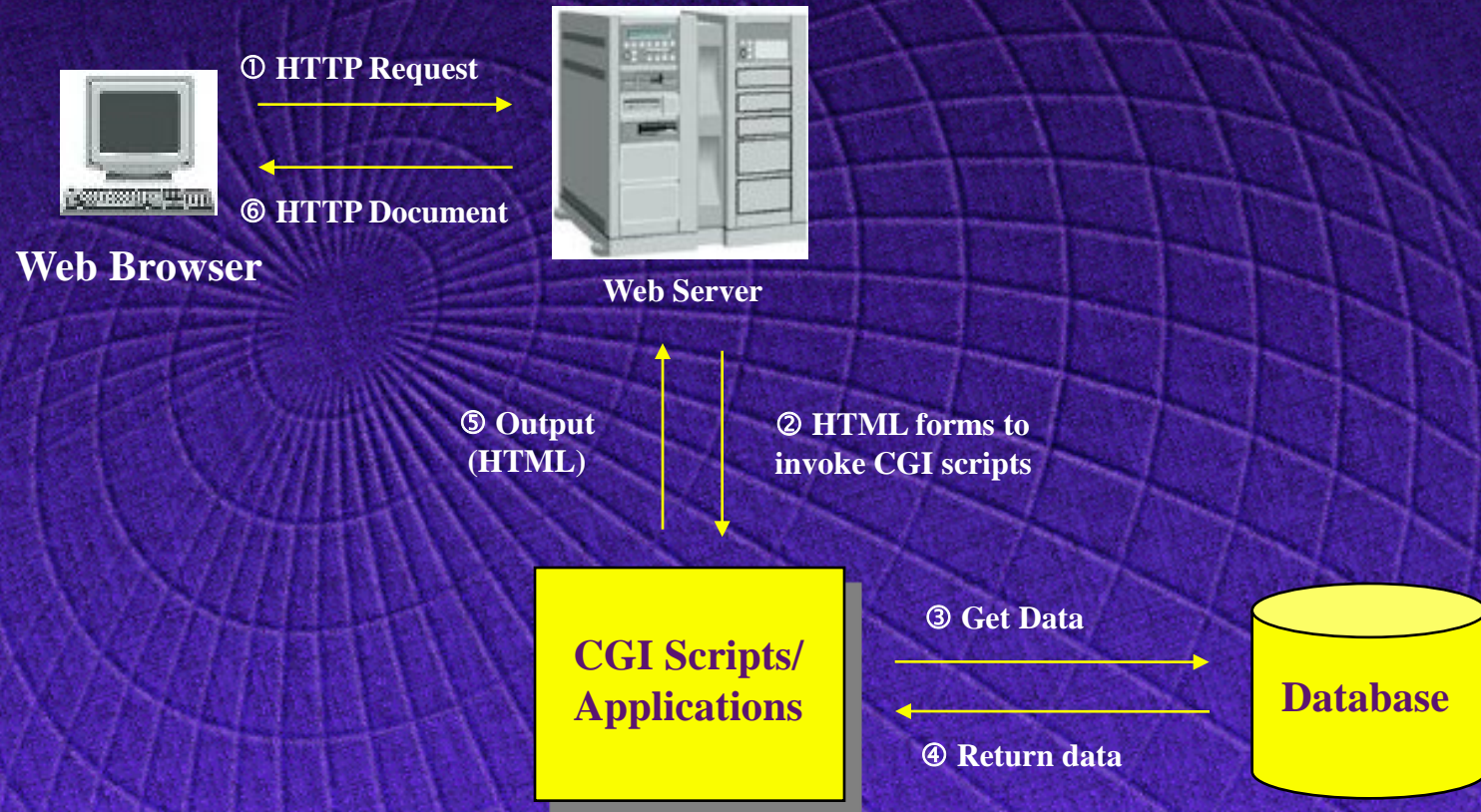


# Common Gateway Interface (CGI)

- ◆ CGI programming techniques were introduced to provide dynamic Web pages via server-side interaction.
- ◆ A standard method to extend the functionality of the web server.
- ◆ Any programming language can be used. Common ones include: Perl, C++, Visual Basic.



# CGI-based Web Application

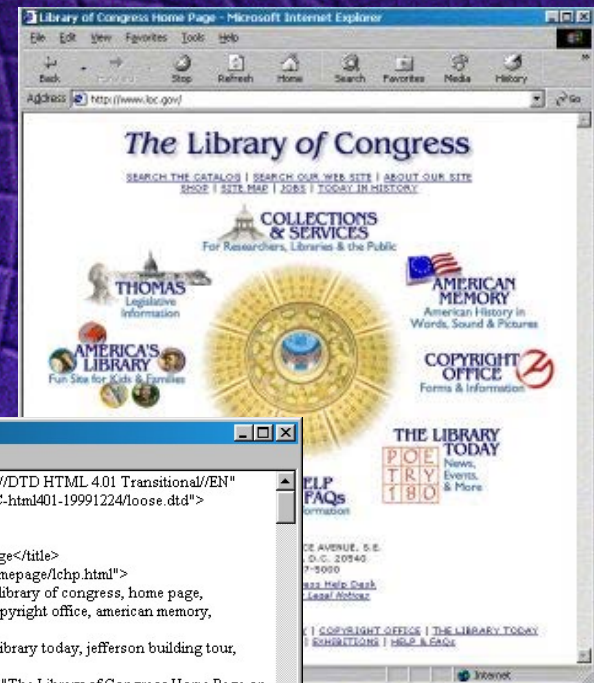




# How Web Page Works

## Sample web page and its source.

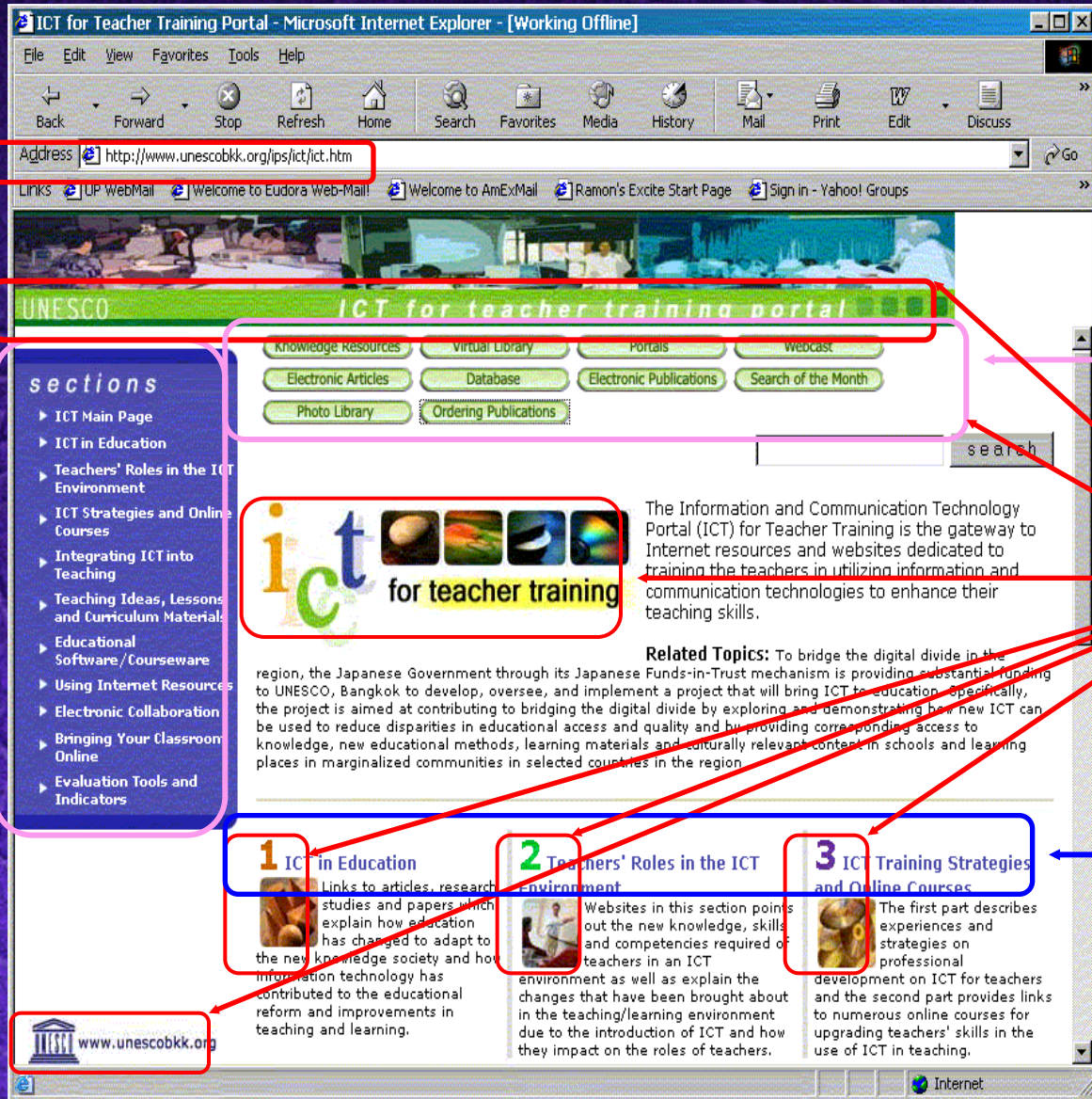
- ◆ The source contains the instructions that define the contents, layout, and structure of a web page.
- ◆ The instructions are written in HTML or another web authoring tool used in creating the page.
- ◆ The browser uses these instructions to interpret and display the web page on the screen.



```
www.loc[1] - Notepad
File Edit Search Help
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/1999/REC-html401-19991224/loose.dtd">
<html>
<head>
<title>Library of Congress Home Page</title>
<base href="http://www.loc.gov/homepage/lchp.html">
<meta name="keywords" content="library of congress, home page,
collections and services, thomas, copyright office, american memory,
exhibitions,
america's library, help and faqs, the library today, jefferson building tour,
catalog, giving, today in history">
<meta name="description" content="The Library of Congress Home Page on
the
World Wide Web.">
<!-- Preload Script (home.psd) -->
<script type="text/javascript" language="JavaScript">
<!--
function newImage(arg) {
    if (document.images) {
        rslt = new Image();
        rslt.src = arg;
        return rslt;
    }
}
```



# How Web Page Works



URL

Address <http://www.unescobkk.org/ips/ict/ict.htm>

Navigational tools

Navigational tools

Graphics / Hyperlinks

Hyperlinks

- sections
- ▶ ICT Main Page
  - ▶ ICT in Education
  - ▶ Teachers' Roles in the ICT Environment
  - ▶ ICT Strategies and Online Courses
  - ▶ Integrating ICT into Teaching
  - ▶ Teaching Ideas, Lessons and Curriculum Material
  - ▶ Educational Software / Courseware
  - ▶ Using Internet Resources
  - ▶ Electronic Collaboration
  - ▶ Bringing Your Classroom Online
  - ▶ Evaluation Tools and Indicators

- Knowledge Resources
- Virtual Library
- Portals
- Webcast
- Electronic Articles
- Database
- Electronic Publications
- Search of the Month
- Photo Library
- Ordering Publications



The Information and Communication Technology Portal (ICT) for Teacher Training is the gateway to Internet resources and websites dedicated to training the teachers in utilizing information and communication technologies to enhance their teaching skills.

**Related Topics:** To bridge the digital divide in the region, the Japanese Government through its Japanese Funds-in-Trust mechanism is providing substantial funding to UNESCO, Bangkok to develop, oversee, and implement a project that will bring ICT to education. Specifically, the project is aimed at contributing to bridging the digital divide by exploring and demonstrating how new ICT can be used to reduce disparities in educational access and quality and by providing corresponding access to knowledge, new educational methods, learning materials and culturally relevant content in schools and learning places in marginalized communities in selected countries in the region.

**1 ICT in Education**  
Links to articles, research studies and papers which explain how education has changed to adapt to the new knowledge society and how information technology has contributed to the educational reform and improvements in teaching and learning.

**2 Teachers' Roles in the ICT Environment**  
Websites in this section point out the new knowledge, skills and competencies required of teachers in an ICT environment as well as explain the changes that have been brought about in the teaching/learning environment due to the introduction of ICT and how they impact on the roles of teachers.

**3 ICT Training Strategies and Online Courses**  
The first part describes experiences and strategies on professional development on ICT for teachers and the second part provides links to numerous online courses for upgrading teachers' skills in the use of ICT in teaching.

 [www.unescobkk.org](http://www.unescobkk.org)



# Cookies

- ◆ A piece of information generated by the web-server and stored in the client side ready for future access.
- ◆ Cookies can make CGI scripts more interactive.
- ◆ Cookies are text files stored on Web client.
- ◆ CGI script creates cookie and has a Web server sent it to client's browser to store on hard disk.
- ◆ Later, when client revisits Web site and uses a CGI script that requests this cookie, client's browser sends information stored in the cookie.



# Cookies

## ◆ How do cookies work?



## ◆ Where are cookies used?

- ✓ Shopping applications
- ✓ Storing login information
- ✓ Tracking pages visited by a user



# Summary

- ◆ The Web is a networked information system that contains a huge collection of files
- ◆ The Web relies on clients and servers
- ◆ HTML and other files are sent from servers to clients
- ◆ Files are identified by URLs
- ◆ Servers send files to browsers
- ◆ Browsers interpret HTML
- ◆ Cookies is a piece of information generated by the web-server and stored in the client side.