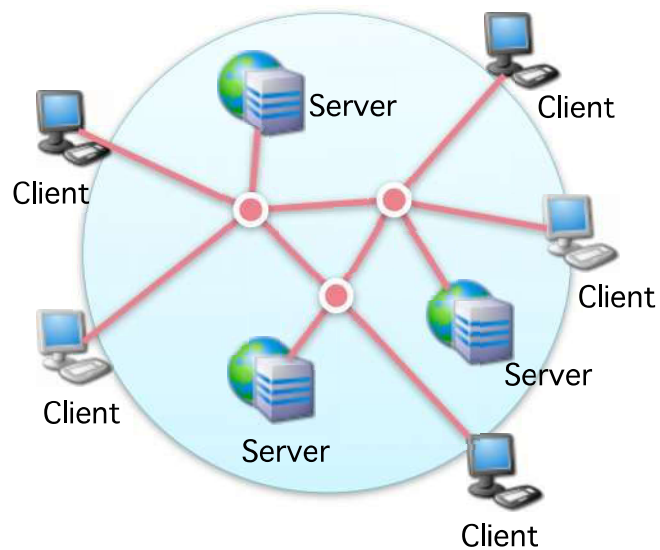


Internet Engineering

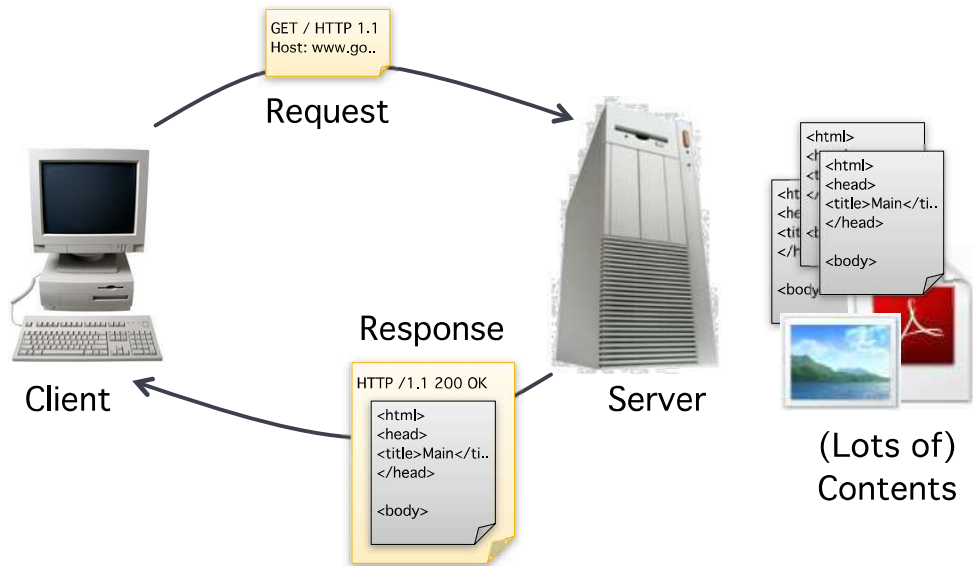
Web Basics

Lecture 2

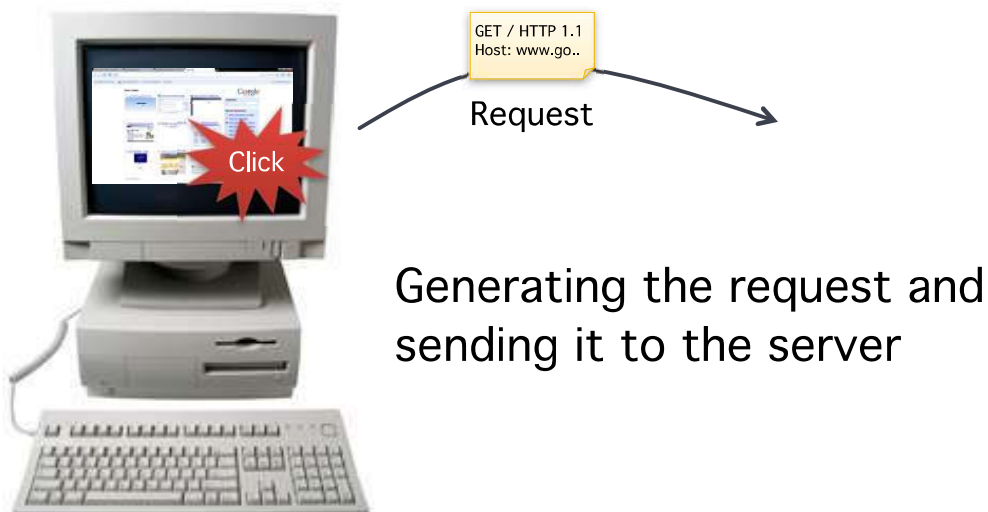
Web Servers and Clients



What does web servers do?



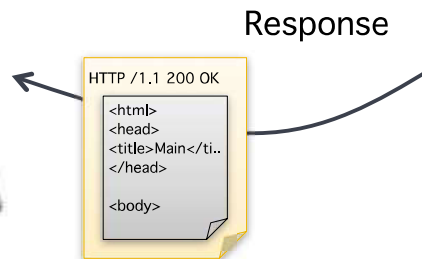
What does web clients do?



What does web clients do?



Getting the HTML and rendering it

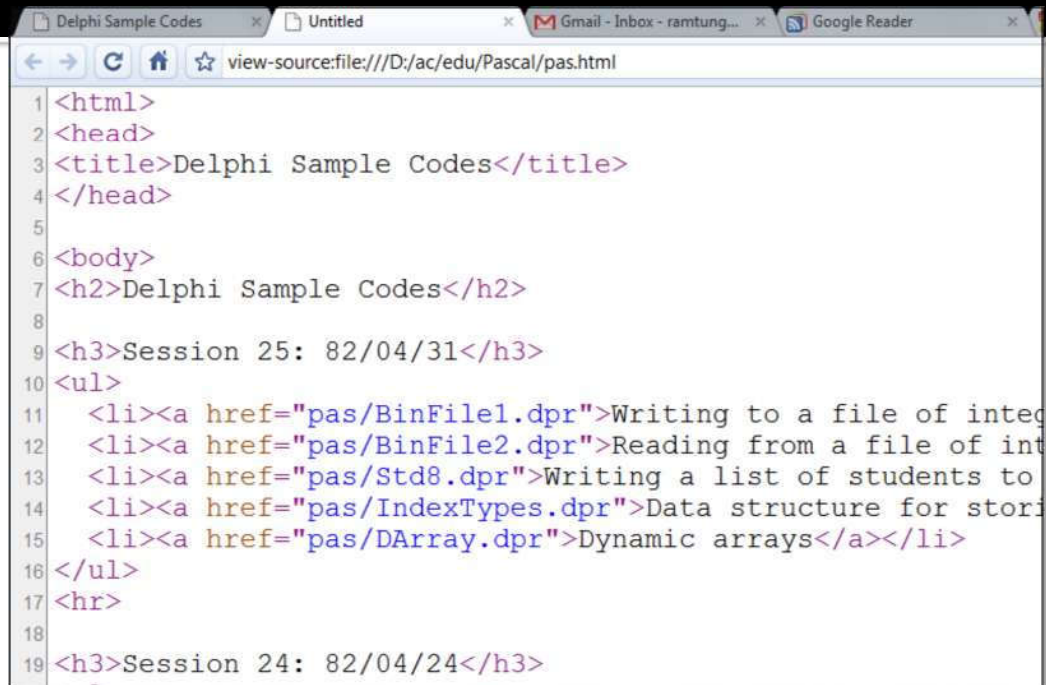


The way they talk

- HTML tells the browser how to display the content to the user.
- HTTP is the protocol the server and the client use on the web to communicate.
- The server uses HTTP to send HTML to the client.



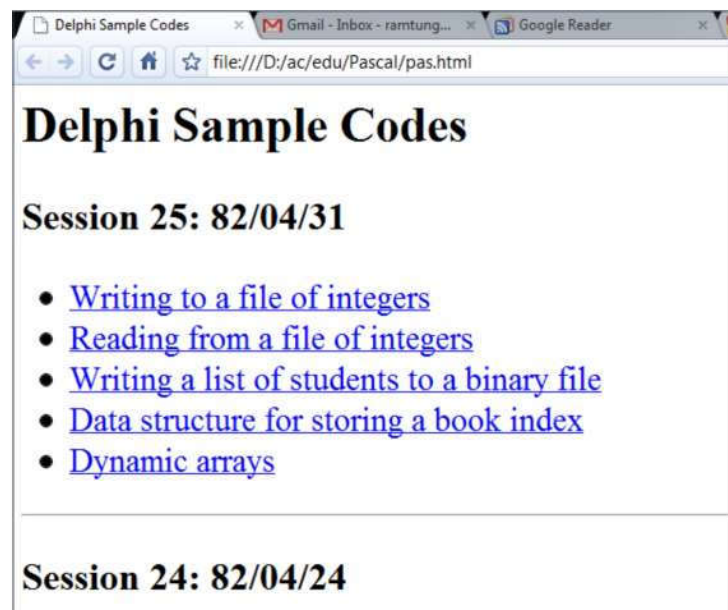
What HTML looks like?



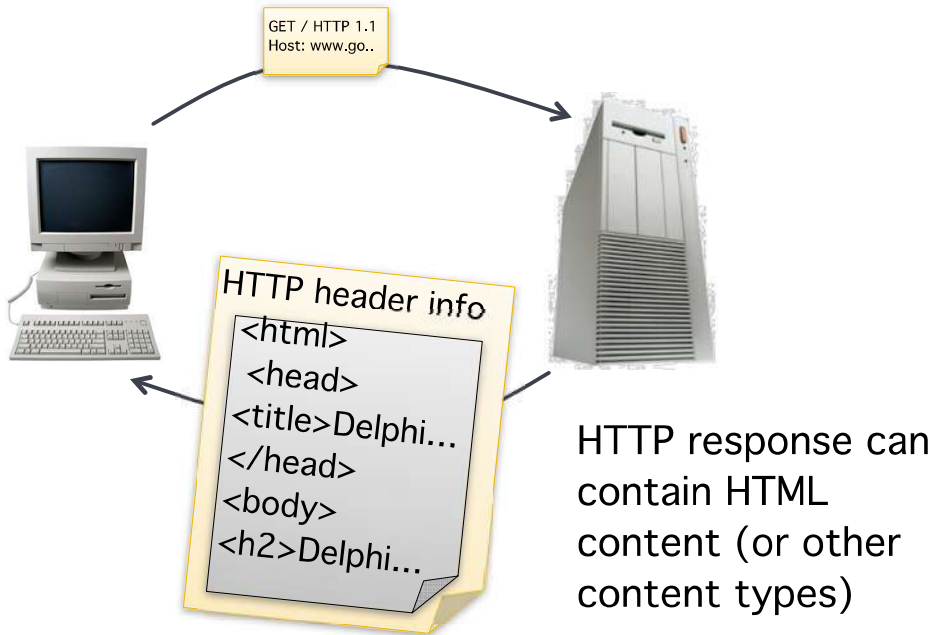
The screenshot shows a web browser window with the address bar displaying 'view-source:file:///D:/ac/edu/Pascal/pas.html'. The browser tabs include 'Delphi Sample Codes', 'Untitled', 'Gmail - Inbox - ramtung...', and 'Google Reader'. The source code is displayed in a monospaced font with line numbers on the left. The code defines an HTML document with a title 'Delphi Sample Codes', a main heading 'Delphi Sample Codes', a subheading 'Session 25: 82/04/31', and a list of five links. The links are: 'Writing to a file of integers', 'Reading from a file of integers', 'Writing a list of students to a binary file', 'Data structure for storing a book index', and 'Dynamic arrays'. The document also includes a horizontal line and a subheading 'Session 24: 82/04/24'.

```
1 <html>
2 <head>
3 <title>Delphi Sample Codes</title>
4 </head>
5
6 <body>
7 <h2>Delphi Sample Codes</h2>
8
9 <h3>Session 25: 82/04/31</h3>
10 <ul>
11 <li><a href="pas/BinFile1.dpr">Writing to a file of integers
12 <li><a href="pas/BinFile2.dpr">Reading from a file of integers
13 <li><a href="pas/Std8.dpr">Writing a list of students to a binary file
14 <li><a href="pas/IndexTypes.dpr">Data structure for storing a book index
15 <li><a href="pas/DArray.dpr">Dynamic arrays</a></li>
16 </ul>
17 <hr>
18
19 <h3>Session 24: 82/04/24</h3>
```

and how is it rendered?

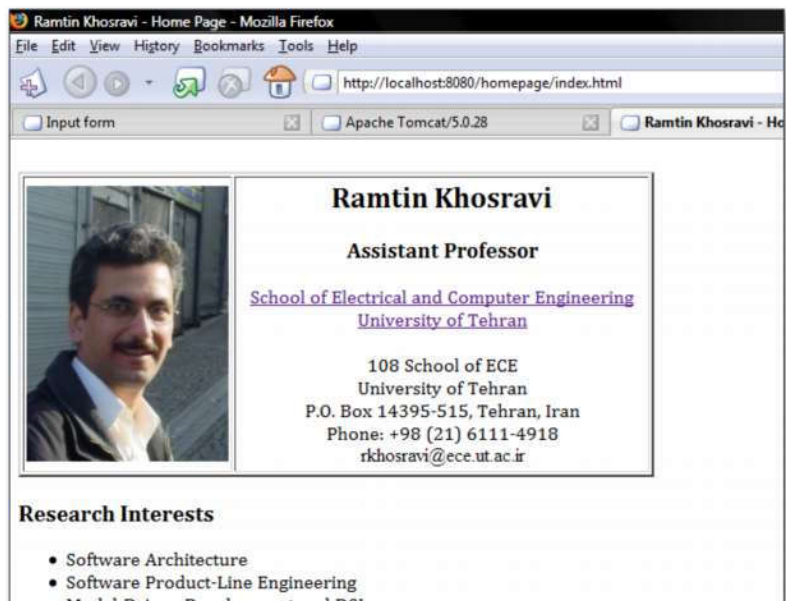


HTML and HTTP Response



What about other stuff?

like images
on the page



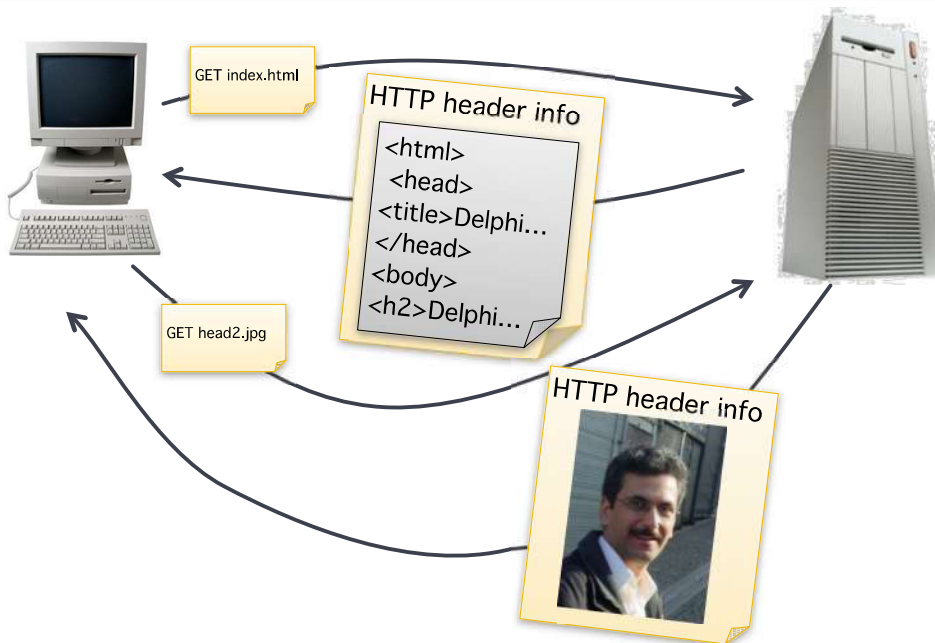
What about other stuff?

```
<html>
<head> <title>Ramtin
...
</head>

<body>
...
<img src= "head2.jpg">
...
</body>
</html>
```

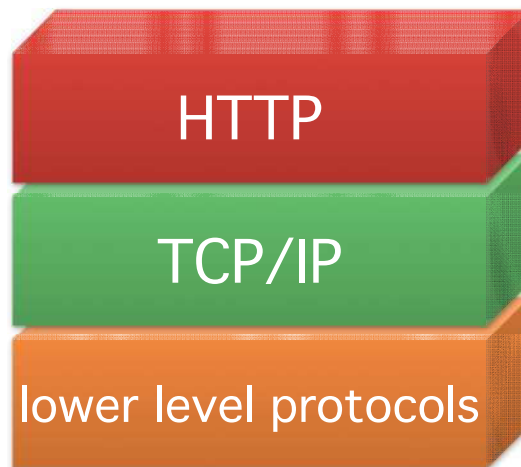


Multiple requests per page



HTTP works over TCP/IP

- TCP makes sure that your data is sent reliably over the network.
- IP routes the packets along the way to the destination.



HTTP Request and Response

Key elements in Request:

- HTTP method (what to do)
- The page to access (a URL)
- Form parameters



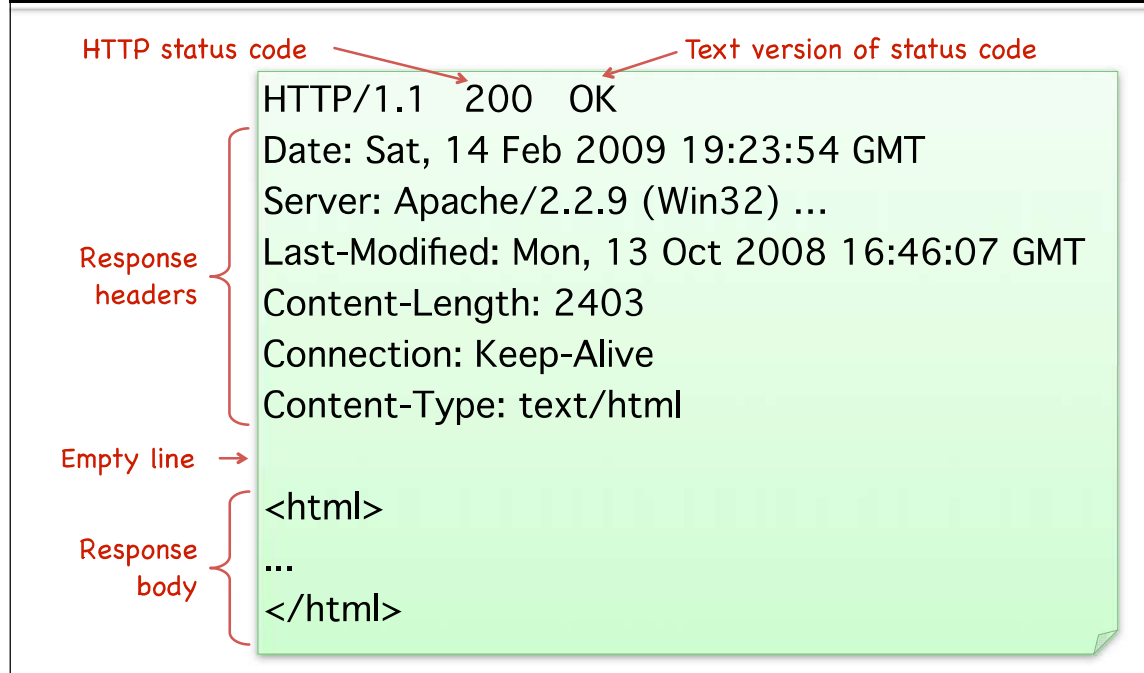
Key elements in Response:

- A status code
- Content-type (HTML, picture, ...)
- The content (actual HTML, ...)

The anatomy of HTTP request



The anatomy of HTTP response



A misspelled resource

```
GET /rkhosravi/oondex.html HTTP/1.1
Host: ece.ut.ac.ir
...
```

```
HTTP/1.1 404 Not Found
Date: Sat, 14 Feb 2009 19:38:02 GMT
Server: Apache/2.2.9 (Win32)
...
```



HTTP Status Codes

- 1xx Informational
- 2xx Success
- 3xx Redirection
- 4xx Client Error
- 5xx Server Error



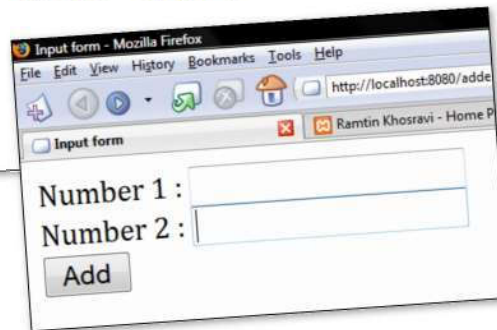
Posting information to server

```
<html>
<head><title>Input form</title></head>

<body>

<form method="POST" action="add.jsp">
    Number 1 : <input type="text" name="num1"><br>
    Number 2 : <input type="text" name="num2"><br>
    <input type="submit" value="Add">
</form>

</body>
</html>
```



The POST request

Request line → POST /adder2/add.jsp HTTP/1.1

Request headers {
Host: adder.ir
User-Agent: Mozilla/5.0 (...
Accept: text/html,application/xhtml+xml, ...
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Keep-Alive: 300
Connection: keep-alive

Empty line →

Request body {
num1=13&num2=7

HTTP Methods

- The Request Method can be:

GET
POST
OPTIONS

HEAD
DELETE

PUT
TRACE

future expansion is supported

HTTP Methods

- GET: to get content from the server
- POST: to send form data to the server
- HEAD: to retrieve meta-information
- PUT: to store information under the URL
- DELETE: to remove the entity under the URL
- TRACE: to trace HTTP forwarding
- OPTIONS: to retrieve capabilities of the server

Uniform Resource Locator

http://ece.ut.ac.ir:80/rkhosravi/home/pub.html

The diagram illustrates the components of the URL http://ece.ut.ac.ir:80/rkhosravi/home/pub.html. Red arrows point from labels below to specific parts of the URL: 'protocol' points to 'http', 'port' points to ':80', and 'resource' points to '/rkhosravi/home/pub.html'. Red curly braces above the URL group 'ece.ut.ac.ir' as the 'server (host)' and '/rkhosravi/home/pub.html' as the 'path'.

protocol port resource

the default port for HTTP is 80

Uniform Resource Locator

http://google.com/search?q=Apache&ie=utf-8&oe=utf-8

The diagram illustrates the components of the URL http://google.com/search?q=Apache&ie=utf-8&oe=utf-8. A red curly brace above the query string part of the URL groups 'q=Apache&ie=utf-8&oe=utf-8' as the 'query string'.

query string