Web Technologies

Internet, standards and protocols

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Internet
Definition

- Internet is the global system of interconnected computer networks

- Internet allows information be sent from a computer to another

Internet
Web

- The Web is the common name for the World Wide Web

- The Web is an information system enabling documents and other web resources to be accessed over the Internet.

- Documents and downloadable media are made available to the network through web servers and can be accessed by programs such as web browsers.

Internet
Brief history

- 1969, ARPANET

- 1989, Web, invented by Tim Berners-Lee

- 1990, nxoc01.cern.ch, the first web server

- 1994, PHP, Yahoo

- 1995, IE, Apache, Java, Javascript

Internet
Brief history

- 1996, Hotmail, the first web based mail

- 1998, Google

- 2004, Web 2.0

- 2007, HTML 5

Internet
Terminologies

- HTML, HyperText Markup Language,

- URL, Uniform Resource Locator,

- Protocol

- HTTP, HyperText Transfer Protocol,

- HTTPS

- FTP, File Transfer Protocol

Internet
Terminologies

- Web page

- Web site

- Web browser/navigator/client

- Web server

- DNS, Domain Name Server

Internet
URL

- Format,

  - protocol://username:password@domain:port/path/filename?parameters

- Examples,

  - https://www.univ-msila.dz/index.php?q=informatique

  - ftp://mi.univ-msila.dz

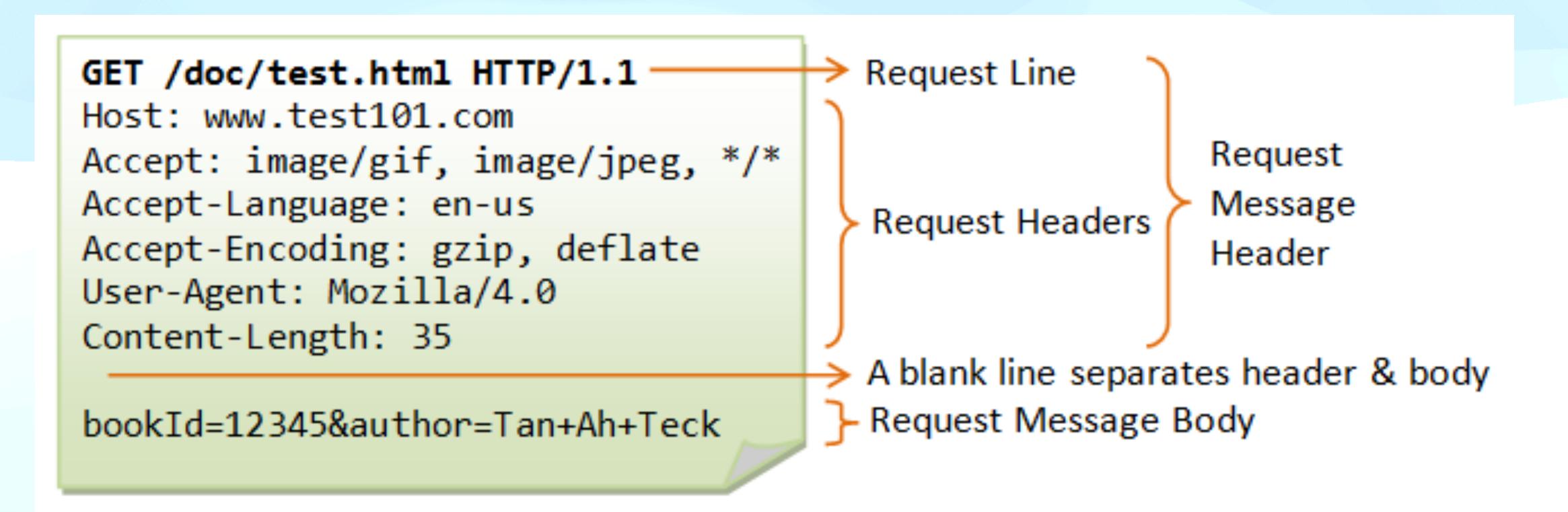 - file:///C:/Users/Public/Desktop/Picture.png

Internet
Protocols

- **Internet Protocol (IP),** is a protocol, or set of rules, for routing and addressing packets of data so that they can travel across networks and arrive at the correct destination.

- **Transmission Control Protocol (TCP),** TCP is a popular communication protocol which is used for communicating over a network. It divides any message into series of packets that are sent from source to destination and there it gets reassembled at the destination.

Internet
Protocols

- **User Datagram Protocol (UDP),** UDP is a substitute communication protocol to Transmission Control Protocol implemented primarily for creating loss-tolerating and low-latency linking between different applications.

- **Post office Protocol (POP),** POP3 is designed for receiving incoming E-mails.

- **Simple Mail Transport Protocol (SMTP),** SMTP is designed to send and distribute outgoing E-Mail.

Internet
Protocols

- **File Transfer Protocol (FTP),** FTP allows users to transfer files from one machine to another.

- **Hyper Text Transfer Protocol (HTTP),** HTTP is designed for transferring a hypertext among two or more systems. HTML tags are used for creating links. These links may be in any form like text or images.

Internet
Protocols

- **Hyper Text Transfer Protocol Secure (HTTPS),** HTTPS is a secured HTTP protocol.

- **Telnet,** Telnet is a set of rules designed for connecting one system with another.

Internet
HTTP

- HTTP Request,


```
GET /doc/test.html HTTP/1.1          ──────► Request Line
Host: www.test101.com
Accept: image/gif, image/jpeg, */*
Accept-Language: en-us
Accept-Encoding: gzip, deflate       ──► Request Headers
User-Agent: Mozilla/4.0
Content-Length: 35

                                     ──────► A blank line separates header & body
bookId=12345&author=Tan+Ah+Teck      ──► Request Message Body
```

Request Message Header

Internet
HTTP

- HTTP Response,

```
HTTP/1.1 200 OK                              → Status Line
Date: Sun, 08 Feb xxxx 01:11:12 GMT
Server: Apache/1.3.29 (Win32)
Last-Modified: Sat, 07 Feb xxxx
ETag: "0-23-4024c3a5"
Accept-Ranges: bytes                           Response Headers
Content-Length: 35
Connection: close
Content-Type: text/html

                                             → A blank line separates header & body
<h1>My Home page</h1>                        → Response Message Body
```

Response Message Header

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HTTP

- HTTP Response codes,

  - **1xx** Informational responses

  - **2xx** Successful responses

  - **3xx** Redirection messages

  - **4xx** Client error responses

  - **5xx** Server error responses

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HTTP

- Exapmles of HTTP responses,

  - 200 OK

  - 301 Moved Permanently

  - 307 Temporary Redirect

  - 403 Forbidden

  - 404 Not Found

  - 500 Internal Server Error

  - 503 Service Unavailable

Internet
HTTP

- HTTP request methods

  - **GET**, requests a representation of the specified resource. Requests using GET should only retrieve data.

  - **HEAD** , asks for a response identical to a GET request, but without the response body.

  - **POST**, submits an entity to the specified resource, often causing a change in state or side effects on the server.

  - **PUT**, replaces all current representations of the target resource with the request payload.

Internet
HTTP

- HTTP request methods

  - **DELETE**, deletes the specified resource.

  - **CONNECT**, establishes a tunnel to the server identified by the target resource.

  - **OPTIONS**, describes the communication options for the target resource.

  - **TRACE**, performs a message loop-back test along the path to the target resource.

  - **PATCH**, applies partial modifications to a resource.

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HTTP

- Some HTTP request fields

  - **Accept**, e.g. Accept: text/html

  - **Accept-Encoding**,

  - **Referer**,

  - **Content-Length**,

  - **Content-Type**,