HTTP

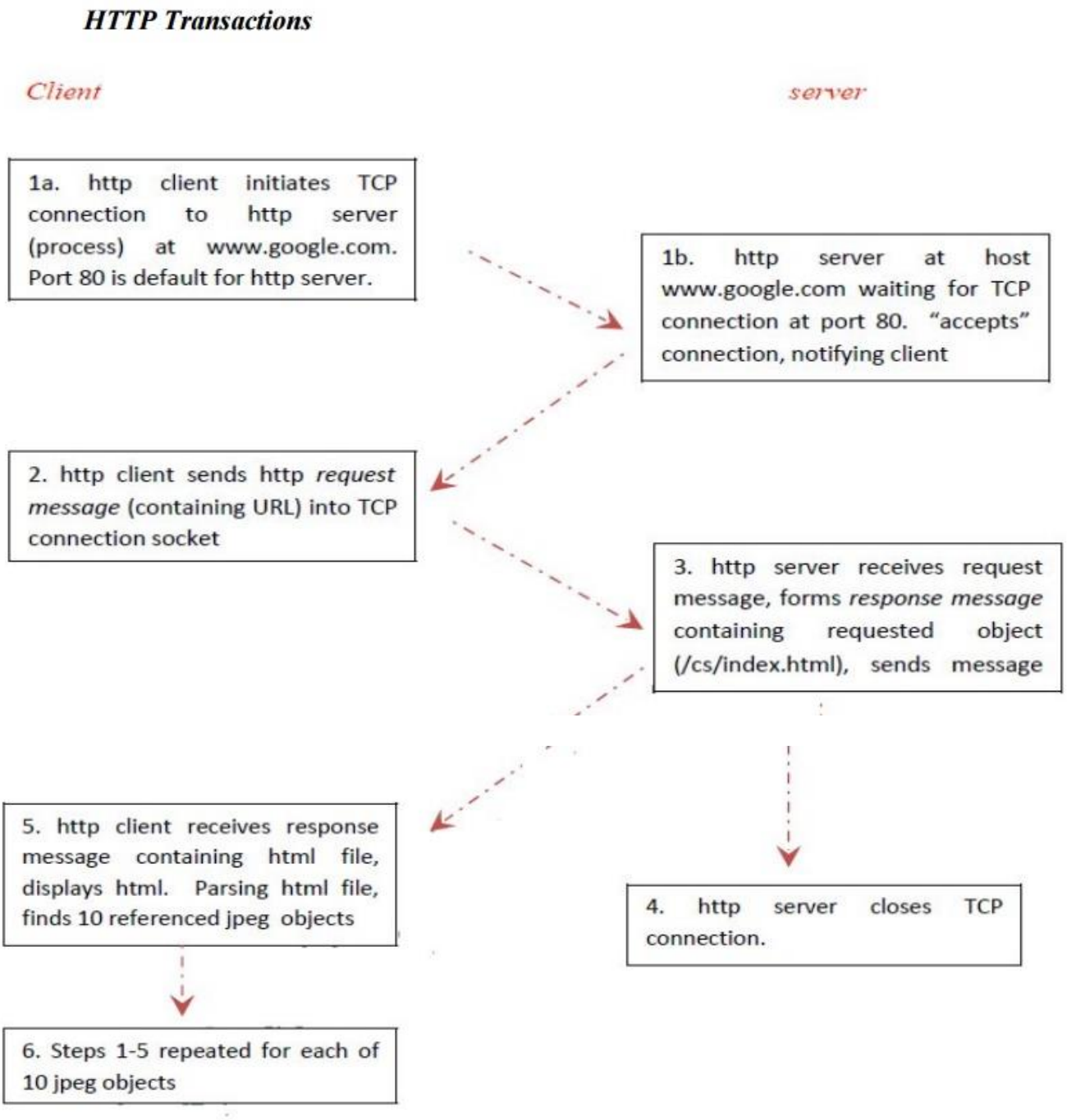
Hypertext Transfer Protocol (HTTP) is the communication protocol used by the Internet to transfer hypertext documents.

A protocol to transfer hypertext requests and information between servers and browsers

Hypertext is text, displayed on a computer, with references (hyperlinks) to other text that the reader can immediately follow, usually by a mouse HTTP is behind every request for a web document or graph, every click of a hypertext link, and every submission of a form.

- HTTP specifies how clients **request** data, and how servers **respond** to these requests.
- The client makes a request for a given page and the server is responsible for finding it and returning it to the client.
- The browser connects and requests a page from the server.
- The server reads the page from the file system and sends it to the client and then terminates the connection

HTTP Transactions



HTTP Message:

HTTP message is the information transaction between the client and server.

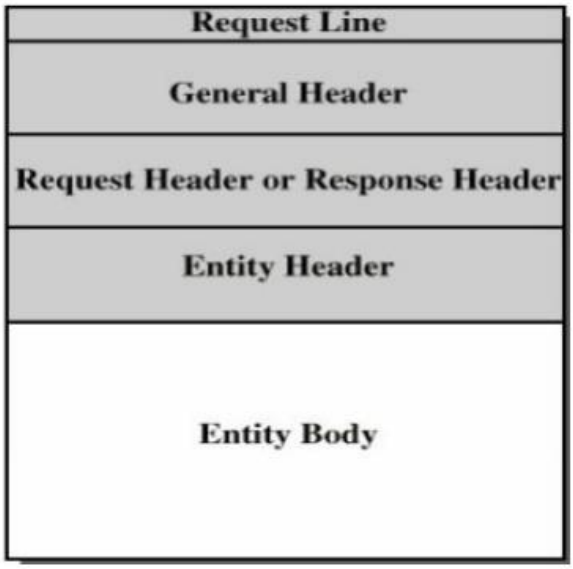
Two types of HTTP Message:

1. Requests

    a. Client to server

2. Responses

    a. Server to client



Fields

- Request line or Response line
- General header
- Request header or Response header
- Entity header
- Entity body

Request Message:

Request Line:

- A request line has three parts, separated by Spaces

o a *method* name

o the local path of the requested resource o the version of HTTP being used

• A typical request line is:

o GET /path/to/file/index.html HTTP/1.1

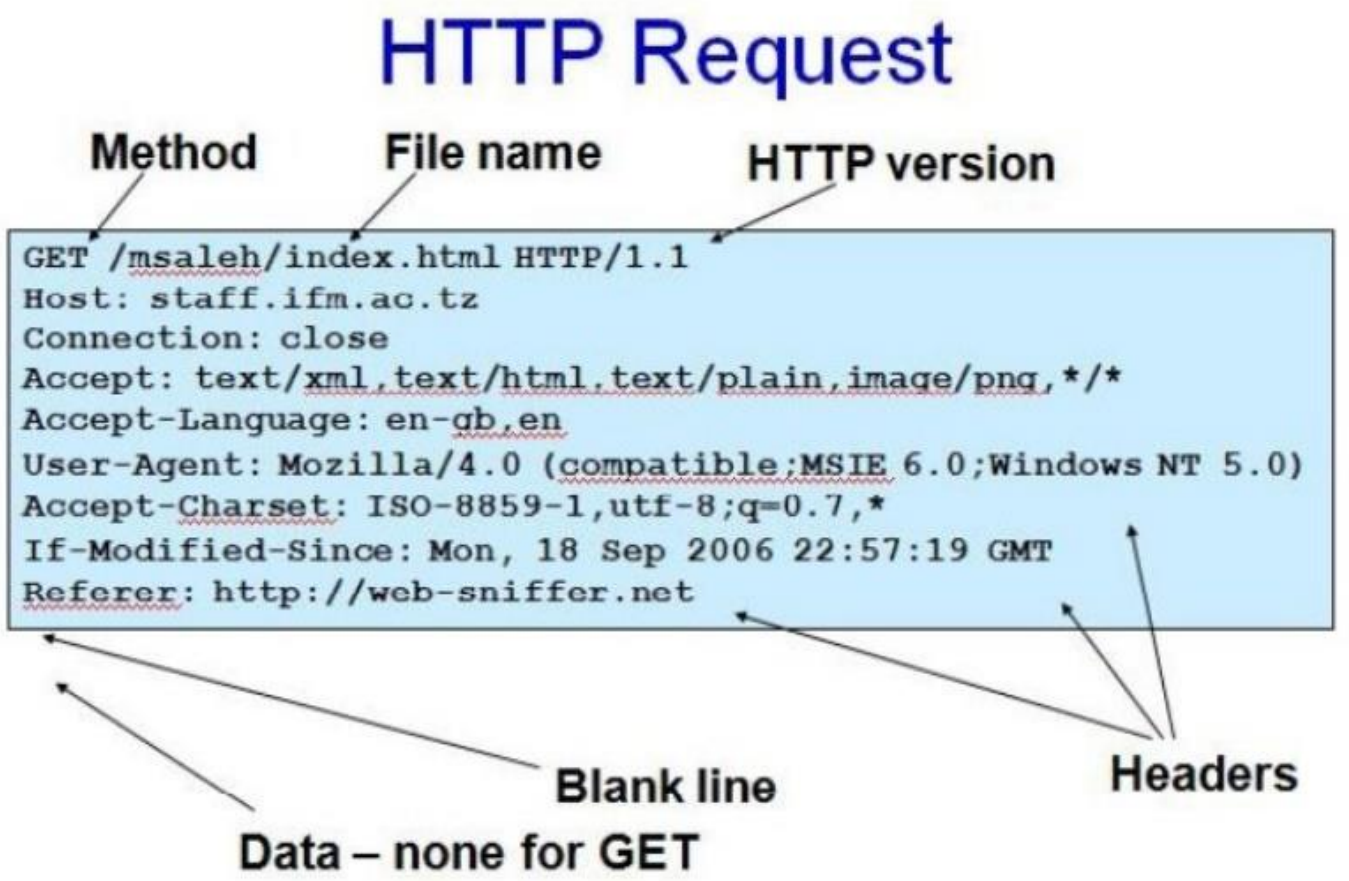
o **GET** is the most common HTTP method; it says "give me this resource". Other methods include **POST** and **HEAD.** Method names are always uppercase

o The path is the part of the URL after the host name, also called the *request URI* o The HTTP version always takes the form "**HTTP/x.x**", uppercase.

Request Header:

HTTP Request Headers

Header	Description
From	Email address of user
User-Agent	Client s/w
Accept File	File types that client will accept
Accept-encoding	Compression methods
Accept-Language	Languages
Referrer	URL of the last document the client displayed
If-Modified-Since	Return document only if modified since specified
Content-length	Length (in bytes) of data to follow



Response Message:

Response Line:

- A request line has three parts, separated by spaces
    - o the HTTP version,
    - o a *response status code* that gives the result of the request, and
    - o an English *reason phrase* describing the status code
- Typical status lines are:
    - o HTTP/1.0 200 OK or
    - o HTTP/1.0 404 Not Found

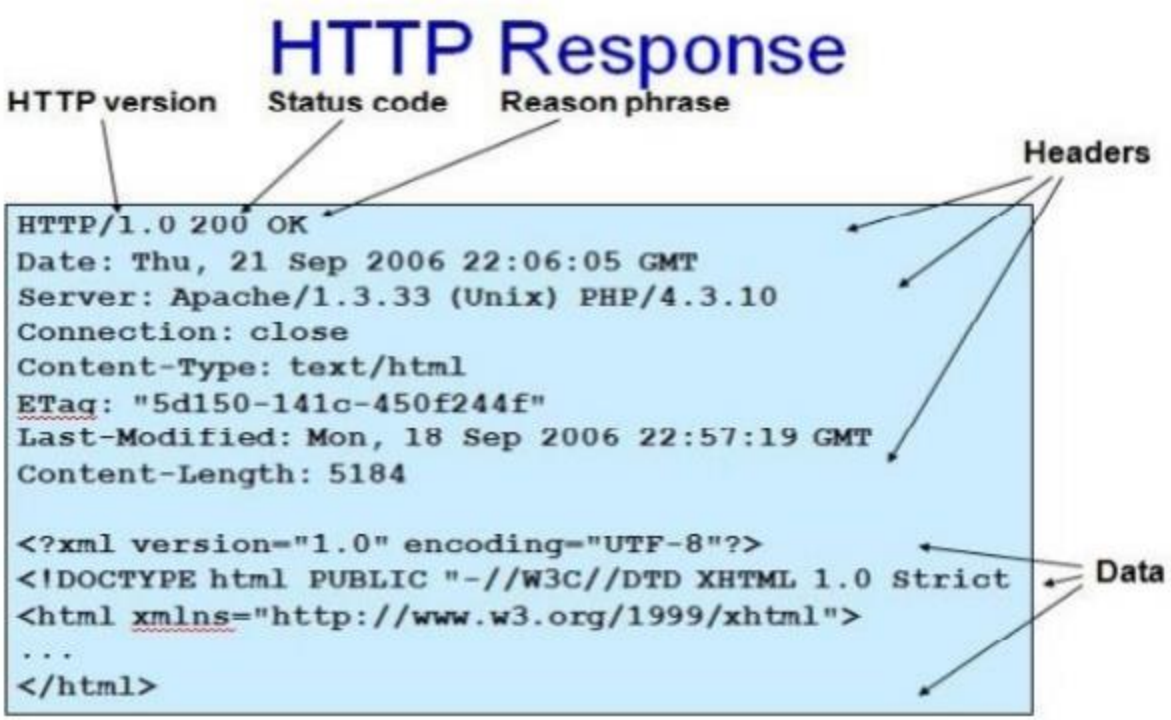
o The HTTP version is in the same format as in the request line, "**HTTP/x.x**".

o The status code is meant to be computer-readable; the reason phrase is meant to be human-readable, and may vary.

HTTP Request Header:

HTTP Response Headers

Header	Description
Server	Server software
Date	Current Date
Last-Modified	Modification date of document
Expires	Date at which document expires
Location	The location of the document in redirection responses
Pragma	A hint, e.g., no cache
MIME-version	
Link	URL of document's parent
Content-Length	Length in bytes
Allowed	Requests that user can issue, e.g., GET



HTTP Method:

• HTTP method is supplied in the request line and specifies the operation that the client has requested.

Some common methods:

- Options
- Get
- Head
- Post
- Put
- Move
- Delete

Two methods that are mostly used are the GET and POST:

o **GET** for queries that can be safely repeated

o **POST** for operations that may have side effects (e.g. ordering a book from an on-line store).

The GET Method

• It is used to retrieve information from a specified URI and is assumed to be a safe, repeatable operation by browsers, caches and other HTTP aware components

• Operations have no side effects and GET requests can be re-issued.

• For example, displaying the balance of a bank account has no effect on the account and can be safely repeated.

• Most browsers will allow a user to refresh a page that resulted from a **GET**, without displaying any kind of warning

• Proxies may automatically retry **GET** requests if they encounter a temporary network connection problem.

• GET requests is that they can only supply data in the form of parameters encoded in the URI (known as a **Query String**) – [downside]

Cannot be unused for uploading files or other operations that require large amounts of data to be sent to the server.

The POST Method

• Used for operations that have side effects and cannot be safely repeated.

• For example, transferring money from one bank account to another has side effects and should not be repeated without explicit approval by the user.

If you try to refresh a page in Internet Explorer that resulted from a **POST**, it displays the following message to warn you that there may be side effects:

The **POST** request message has a content body that is normally used to send parameters and data

• The IIS server returns two status codes in its response for a **POST** request

o The first is **100 Continue** to indicate that it has successfully received the **POST** request

o The second is **200 OK** after the request has been processed.

HTTP response status codes

• Informational (1xx)

• Successful (2xx)

• Redirection (3xx)

o 301: moved permanently

• Client error (4xx)

o 403 : forbidden o 404: Not found

• Server error (5xx)

o 503: Service unavailable

o 505: HTTP version not supported