

Hypertext Transfer Protocol (HTTP)



HTTP

- Underlying protocol of the World Wide Web
- Can transfer plain text, hypertext, audio, images, and Internet accessible information
- RFC 2616 (HTTP 1.1)



Overview

- Transaction oriented client/server protocol
- Usually between Web browser (client) and Web server
- Uses TCP connections, port 80
- Can be Stateless
 - Each transaction treated independently
 - New TCP connection for each transaction
 - Terminate connection when transaction complete
- Version 1.1 supports persistent TCP connections (default)



Some Important Terms

- Resource
- Client
- Server
- Origin Server
- Gateway
- Proxy
- Message
- Entity
- Cache

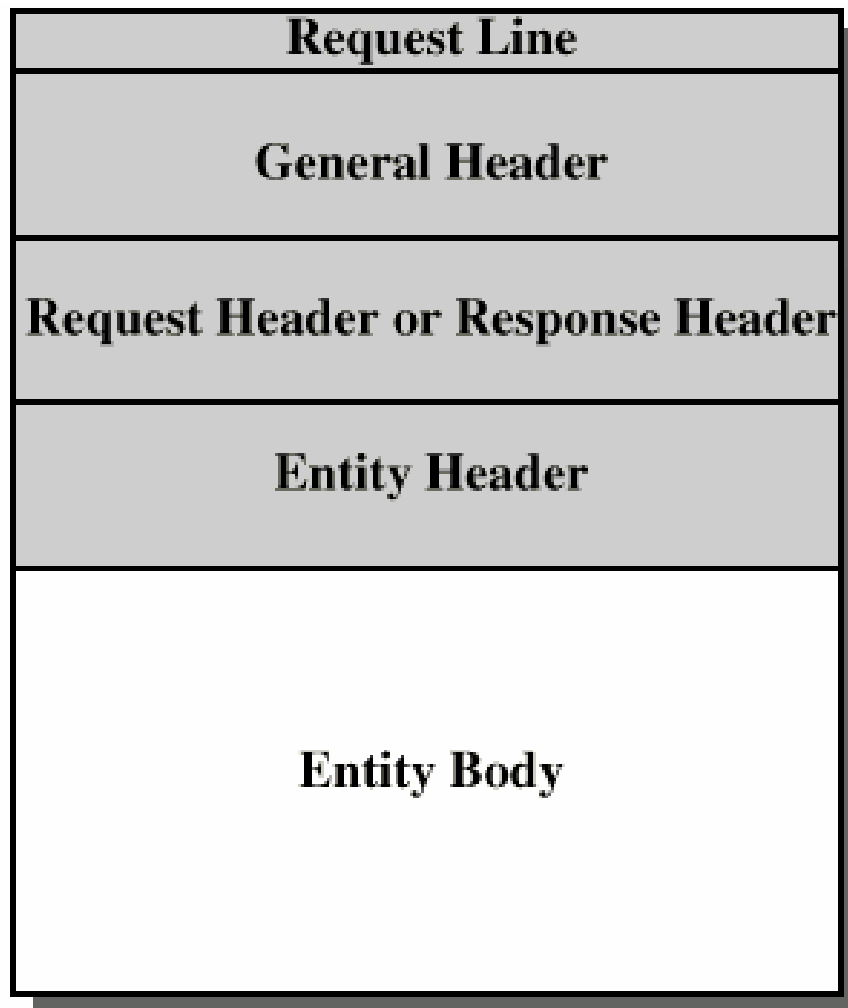


HTTP Messages

- Requests
 - Client to server
- Responses
 - Server to client
- Fields
 - Request line or Response line
 - General header
 - Request header or Response header
 - Entity header
 - Entity body



HTTP Message Structure





General Header Fields - Examples

- Cache control
- Connection
- Date
- Upgrade
- Via
- Other fields are there. See RFC for more details



Request Methods

- Request-Line = Method <SP> Request_URL <SP> HTTP-Version <CRLF>
 - Ex. “GET www.yahoo.com HTTP/1.1”
- Some common methods:
 - Options
 - Get
 - Head
 - Post
 - Put
 - Move
 - Delete
 - Other methods are there



Some Request Header Field

- From
- Host
- Accept
- Accept charset
- Accept encoding
- Accept language
- Authorization
- If-Modified-Since
- User agent



Response Messages

- Status line followed by one or more general, response and entity headers, followed by optional entity body
- Status-Line = HTTP-Version <SP>
Status-Code <SP> Reason-Phrase
<CRLF>
 - Ex. “HTTP/1.1 401 Authorization Required”



Status Codes

- Informational (1xx)
- Successful (2xx)
- Redirection (3xx)
 - 301: moved permanently
- Client error (4xx)
 - 403 : forbidden
 - 404: Not found
- Server error (5xx)
 - 503: Service unavailable
 - 505: HTTP version not supported



Response Header Fields - Examples

- Location
- Retry after
- Server
- Age
- www-authenticate



Entity Header Fields - examples

- Allow
- Content encoding
- Content language
- Content length
- Content type
- Expires
- Last modified
- Title
- Transfer encoding



Entity Body

- Arbitrary sequence of octets
- HTTP transfers any type of data
 - text
 - binary data
 - audio
 - images
 - video
- Interpretation of data determined by header fields
 - Content encoding, content type, transfer encoding



HTTP Proxy

- Takes request from client and forwards to server after possible modifications
- Two separate connections
 - From client to proxy
 - From proxy to server – final server thinks requests coming from proxy, has no knowledge of original client
- Motivation
 - Security, Accounting/Logging, Central cache, NAT