

Introduction to HTTP (1)

- Detailed information can be found in RFC2616.
- Request/Response protocol.
- HTTP runs over TCP/IP.
- HTTP is a text-based protocol.
- In general, communication is initiated by a client (user agent) making a request for a resource on a server (e.g. sending a request for an HTML file).

Introduction to HTTP (2)

- Versions currently in use are 1.0 and 1.1.
- An HTTP has a version field indicating the HTTP version the message is encoded in:
HTTP-Version = "HTTP/" num ":" num
- Resources are encoded as Uniform Resource Identifiers as:
"http://" host [":" port] [abspath [? query]]

Note on URI's

- If the port is omitted, 80, the default HTTP port is used.
- If the absolute path is omitted, /, the root is assumed.

Structure of HTTP Requests

- Request format:
Method Request_URI HTTP_Version
- Method is the action we are performing on the server. E.g. if we wish to retrieve a resource from the server, the method is GET.
- The URI of the resource on the server we need.
- The HTTP version we (the client) support.

Example

Method: Get

Request-URI: /docs/testing.html

HTTP-Version: HTTP/1.1

Structure of HTTP Responses

- Response format:
HTTP_Version Status_Code Reason
- The HTTP version we are talking in.
- A code indicating the status of the response e.g. 404.
- A textual description of the status e.g. Document not found.

Request and Response

⊞ Hypertext Transfer Protocol

```
GET / HTTP/1.1\r\n
Accept: */*\r\n
Accept-Language: en-us\r\n
Accept-Encoding: gzip, deflate\r\n
User-Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; MyIE2; .NET CLR 1.1.4322)\r\n
Host: www.google.com.mt\r\n
Connection: keep-alive\r\n
Cache-Control: no-cache\r\n
Cookie: PREF=ID=293fe46e9e5d410d:LD=mt:TM=10686661318:LM=10686661321:S=Abo-NRKUPMhBw1xB\r\n
\r\n
```

⊞ Hypertext Transfer Protocol

```
HTTP/1.1 200 OK\r\n
Cache-control: private\r\n
Content-Type: text/html\r\n
Content-Encoding: gzip\r\n
Server: GWS/2.1\r\n
Content-length: 1503\r\n
Date: Wed, 17 Dec 2003 06:58:16 GMT\r\n
Age: 207\r\n
Via: HTTP/1.0 noc-ts2 (Traffic-server/5.2.2 [cmssf ])\r\n
\r\n
Data (1159 bytes)
```

Ethernet II, Src: 00:01:53:80:42:26, Dst: 00:80:ad:51:0b:0d
Internet Protocol, Src Address: 192.168.0.69 (192.168.0.69), Dst Addr: 216.239.59.99 (216.239.59.99)
Transmission Control Protocol, Src Port: 1236 (1236), Dst Port: http (80), Seq: 735932357, Ack=2720937515, Len: 338
Source port: 1236 (1236)
Destination port: http (80)
Sequence number: 735932357
Next sequence number: 735932695
Acknowledgement number: 2720937515
Header length: 20 bytes

Flags: 0x0018 (PSH, ACK)
Window size: 64240
Checksum: 0x6390 (Correct)
Hypertext Transfer Protocol
GET / HTTP/1.1\r\n\r\n
Accept: */*\r\n
Accept-Language: en-us\r\n\r\n

No.	Time	Source	Destination	Protocol	Info
1	0.000000	192.168.0.69	216.239.59.99	TCP	1236 > http [SYN] seq=735932356 Ack=0 wfin=64240 Len=0
2	0.00168	216.239.59.99	192.168.0.69	TCP	http > 1236 [SYN, ACK] seq=2720937514 Ack=735932357 wfin=33408 Len=0
3	0.002010	192.168.0.69	216.239.59.99	TCP	1236 > http [ACK] seq=735932357 Ack=2720937515 wfin=64240 Len=0
4	0.010400	192.168.0.69	216.239.59.99	HTTP	GET / HTTP/1.1
5	0.038954	216.239.59.99	192.168.0.69	TCP	http > 1236 [ACK] seq=2720937515 Ack=735932695 wfin=33408 Len=0
6	0.255204	216.239.59.99	192.168.0.69	HTTP	HTTP/1.1 200 OK
7	0.255374	216.239.59.99	192.168.0.69	HTTP	Continuation
8	0.255401	192.168.0.69	216.239.59.99	TCP	1236 > http [ACK] seq=735932695 Ack=2720939251 wfin=64240 Len=0
9	0.295800	192.168.0.69	216.239.59.99	HTTP	GET /logos/fltght.gif HTTP/1.1
10	0.411406	216.239.59.99	192.168.0.69	TCP	http > 1236 [ACK] seq=2720939251 Ack=735933085 wfin=33408 Len=0
11	0.528935	216.239.59.99	192.168.0.69	HTTP	HTTP/1.1 200 OK
12	0.530143	216.239.59.99	192.168.0.69	HTTP	Continuation
13	0.530187	192.168.0.69	216.239.59.99	TCP	1236 > http [ACK] seq=735933085 Ack=2720942035 wfin=64240 Len=0
14	0.531321	216.239.59.99	192.168.0.69	HTTP	Continuation
15	0.532564	216.239.59.99	192.168.0.69	HTTP	Continuation
16	0.532579	192.168.0.69	216.239.59.99	TCP	1236 > http [ACK] seq=735933085 Ack=2720944819 wfin=64240 Len=0
17	0.545848	216.239.59.99	192.168.0.69	HTTP	Continuation
18	0.547058	216.239.59.99	192.168.0.69	HTTP	Continuation

Frame 4 (392 bytes captured)
Ethernet II, Src: 00:01:53:80:42:26, Dst: 00:80:ad:51:0b:0d
Internet Protocol, Src Address: 192.168.0.69 (192.168.0.69), Dst Addr: 216.239.59.99 (216.239.59.99)
Transmission Control Protocol, Src Port: 1236 (1236), Dst Port: http (80), Seq: 735932357, Ack=2720937515, Len: 338
Source port: 1236 (1236)
Destination port: http (80)
Sequence number: 735932357
Next sequence number: 735932695
Acknowledgement number: 2720937515
Header length: 20 bytes

Flags: 0x0018 (PSH, ACK)
Window size: 64240
Checksum: 0x6390 (Correct)
Hypertext Transfer Protocol
GET / HTTP/1.1\r\n\r\n
Accept: */*\r\n
Accept-Language: en-us\r\n\r\n

```

0020 3b 63 04 d4 00 50 2b dd 6f c5 a2 2e 36 2b 50 18 ;C...P+.O...6+P
0030 fa f0 63 90 00 00 47 45 54 20 2f 20 48 54 54 50 ..C...GE T / HTTP
0040 2f 31 2e 0a 41 63 65 70 74 2d 4c 61 6e 67 75 61 /1.1..AC cept: w/
0050 2a 0d 0a 41 63 65 70 74 2d 4c 61 6e 67 75 61 *.Accep t-Langua
0060 67 65 3a 2e 6e 2d 75 73 0d 0a 41 63 65 70 ge: en-u s..Accep
0070 74 2d 45 6e 63 6f 69 6e 67 3a 20 67 7a 69 70 t-Encodi ng: gzip
0080 2c 20 64 65 66 61 74 65 0d 0a 55 73 65 72 2d , deflat e..User-
0090 41 67 65 6e 63 6f 69 6e 67 3a 20 4d Agent: M ozilla/4
00a0 2e 30 28 64 63 6d 70 61 74 69 6c 6c 65 3b 20 .0 (comp atible:
00b0 43 49 45 20 3e 30 3b 20 57 69 6e 64 6f 77 MSIE 6.0 ; Window
00c0 73 20 54 20 3e 31 3b 20 4d 79 49 45 32 3b S NT 5.1 ; MYIE2;
00d0 2e 4e 45 54 20 43 4c 52 31 2e 31 2e 34 33 .NET CL R 1.1.43
00e0 32 32 29 0d 0a 48 6f 73 74 3a 20 77 77 2e 67 22)...Hos t: www.i

```