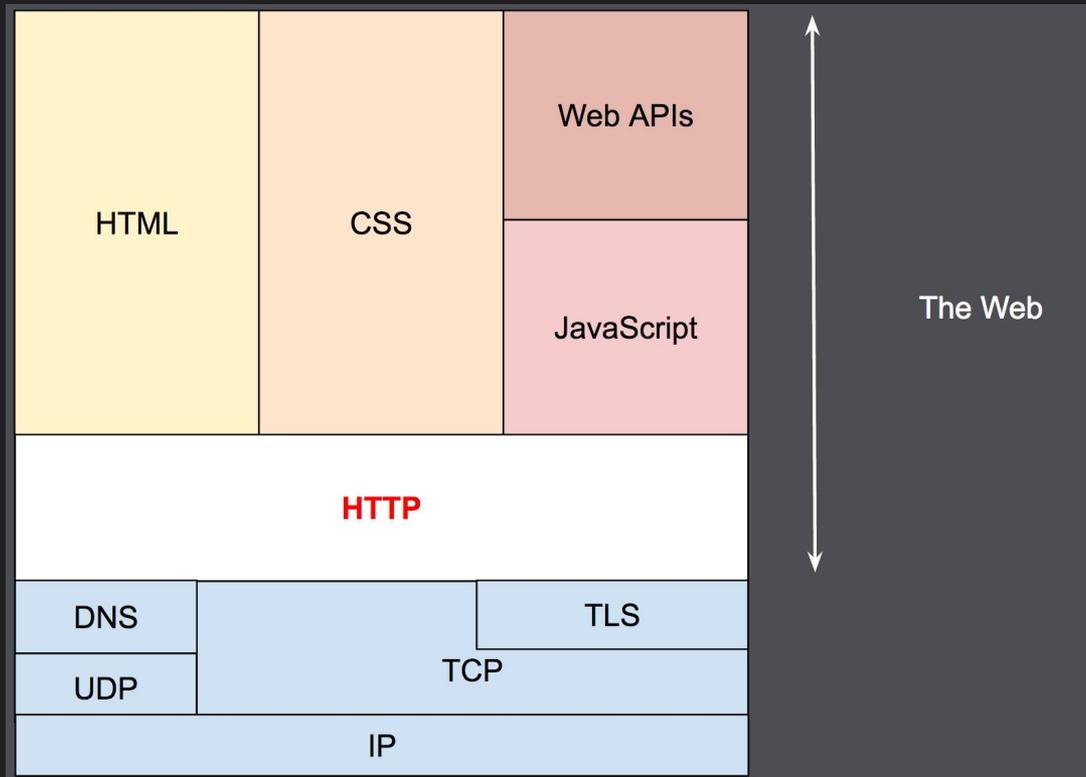# HTTP

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Terminology

- **Uniform Resource Locator (URL)**
  - Identifies web pages and other resources

- **Hypertext Transport Protocol (HTTP)**
  - Transfers web pages from server to client (browser)

- **Hypertext Markup Language (HTML)**
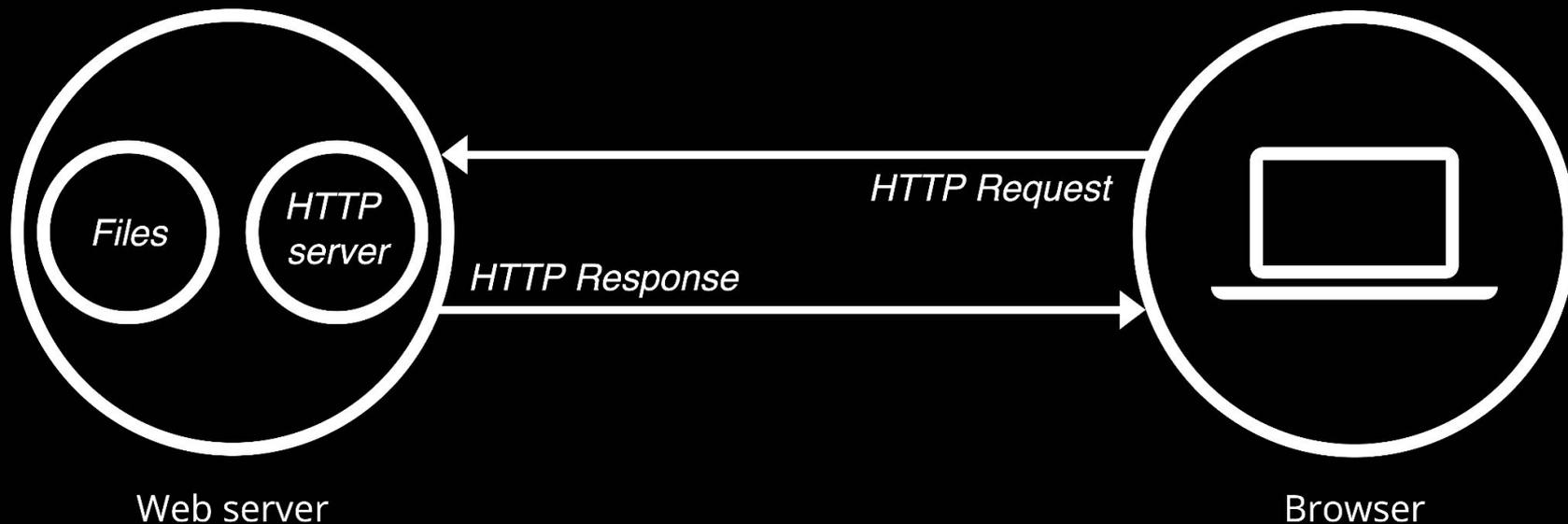 - Creates web pages (parsed/displayed by browser)

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https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview

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Client-Server Overview

Files

HTTP server

HTTP Request

HTTP Response

Web server

Browser

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HTTP Evolution

Version	Year	Description
HTTP/0.9	1990	Simple one line protocol
HTTP/1.0	1996	Added headers and status codes, …
HTTP/1.1	1997	Standardized version, reusable connections, …
HTTP/2	2015	Binary instead of text protocol, …

https://developer.mozilla.org/en-US/docs/Web/HTTP/Basics_of_HTTP/Evolution_of_HTTP

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HTTP Request Methods

- GET

- HEAD

- POST

- PUT

- DELETE

- PATCH

- CONNECT

- OPTIONS

- TRACE

https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods

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Submitting Data

- **GET Method**
  - Encoded data in URL as query string
    (e.g. https://www.google.com/search?q=usfca)
  - Good for getting or retrieving specific data
- **POST Method**
  - Encodes data in request message body
  - Good for posting data to be stored on server

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HTTP/1.1 GET 302 Found

```
$ telnet 138.202.168.1 80

GET /~cs272/birds/birds.html HTTP/1.1
Host: www.cs.usfca.edu

HTTP/1.1 302 Found
 ...
Location: https://www.cs.usfca.edu/~cs272/birds/birds.html
Content-Length: 232
Content-Type: text/html; charset=iso-8859-1
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

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HTTP/1.1 GET 200 OK

```
$ openssl s_client -connect www.cs.usfca.edu:443 -crlf
GET /~cs272/birds/birds.html HTTP/1.1
Host: www.cs.usfca.edu
Connection: close

HTTP/1.1 200 OK
 ...
Content-Length: 2421
Connection: close
Content-Type: text/html; charset=utf-8
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

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HTTP/1.1 GET 404 NOT FOUND

```
$ openssl s_client -connect www.cs.usfca.edu:443 -crlf
GET /~cs272/nowhere.html HTTP/1.1
Host: www.cs.usfca.edu
Connection: close

HTTP/1.1 404 Not Found
 ...
Content-Length: 196
Connection: close
Content-Type: text/html; charset=iso-8859-1
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

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HTTP/1.1 DELETE 405 Not Allowed

```
$ openssl s_client -connect www.cs.usfca.edu:443 -crlf

DELETE /~cs272/birds/birds.html HTTP/1.1
Host: www.cs.usfca.edu
Connection: close

HTTP/1.1 405 Method Not Allowed
 ...
Allow: GET,POST,OPTIONS,HEAD
Content-Length: 223
Content-Type: text/html; charset=iso-8859-1
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

HTTP/1.1 DELETE 405 Not Allowed

```
$ openssl s_client -connect www.cs.usfca.edu:443 -crlf

OPTIONS /~cs272/birds/birds.html HTTP/1.1
Host: www.cs.usfca.edu
Connection: close

HTTP/1.1 200 OK
 ...
Allow: GET,POST,OPTIONS,HEAD
Content-Length: 0
Content-Type: text/html; charset=utf-8
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

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HTTP/1.1 GET 418 Teapot

```
$ openssl s_client -connect www.google.com:443 -crlf
GET /teapot HTTP/1.1
Host: www.google.com
Connection: close

HTTP/1.1 418 I'm a Teapot
Content-Type: text/html; charset=ISO-8859-1
 ...
The requested entity body is short and stout.
Tip me over and pour me out.
```

COMMAND vs INPUT vs OUTPUT (abbreviated)

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Questions?

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