

HTTP

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HyperText Transfer Protocol

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Intro – HTTP, Client, Server

- Web-applications – make use of the internet and the HyperText Transfer Protocol (HTTP) to communicate with other programs.
- The most common form of web-based applications occur as web browsers using HTTP to communicate with web servers.
- For example, when you type a URL of the form `http://www.somewhere.com/index.html`

In real life `index.html` is a file stored on a computer

Server - The computer that your browser eventually gets connected to which will deliver this document

- The computer that you are running your browser binary on and which you are directly interacting with is called the Client.

More on client server model [link](#)

Brief look at HTTP

- User on client machine → type URL → HTTP request is generate
- TCP connection is made to the host on port usually 80
- Server listening on port 80 → receive a string detailing request plus request body
- Eight different types of request / HTTP methods
GET HEAD POST PUT DELETE TRACE CONNECT OPTIONS
- You will only need to make use of two of these, GET and POST.

- Typing a URL in to a browser or clicking an href link

OR

Submission of form data

GET HTTP request

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- <form> tag in HTML is method can generate different kinds of HTTP requests.

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```
<form action="processForm.html" method="POST">
```

Username: <input type="text" name="username">

Password: <input type="password" name="password">

<input type="submit" value="Log in">

```
</form> ...
```

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HTTP request

- An HTTP request takes the form:

METHOD URL HTTP/version

Host: target-host

[other headers]

[blank line]

[contents]

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- Example of Get request string

GET /pages/My%20First%20Webpage HTTP/1.1

Host: www.somewhere.com

Connection: Keep-Alive

User-Agent: Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

Accept: image/gif, image/x-bitmap, image/jpeg, image/pjpeg

Note: (space= %20) My First Webpage as My%20First%20Webpage

HTTP response

- If a server program which knows how to handle HTTP requests receives one, it should generate an HTTP response.
- HTTP is what is known as a stateless protocol → subsequent request from the same client will be independent of the first request.

HTTP responses take the form

```
HTTP/version status-code status-text  
[headers]  
[blank line]  
[content]
```

where the status-code is a numerical code from a list of pre-defined responses.

- **200 OK** The request succeeded and the result is attached
- **404 Not Found** The requested URL doesn't exist
- **301 Moved Permanently** **302 Moved Temporarily**
- **303 See Other** The resource has moved, new location in headers
- **500 Server Error** Unexpected server error, usually an error in the server code

typical example response string

HTTP/1.1 200 OK

Date: Fri, 31 Dec 1999 23:59:59 GMT

Content-Type: text/html

Content-Length: 1354

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<html>

<body>

<h1>Is anyone still awake?</h1>

<p>I'm an example response message, get me out of here!</p>

</body>

</html>

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Again, these HTTP responses are generated for us by server applications so that we don't need to worry about them.

THE HTTP GET METHOD

- This method is most appropriate for requesting services
- Query the server but do not change its state in any way
- Looking up a person's telephone number in a server database, but not editing or updating that number in any way.

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- The URL (in red) below), requests a file in the cgi-bin directory, which indicates to an HTTP server that an application is to be executed. The program being requested is called CheckLogin and then, the parameters being passed follow in the URL.

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- GET `/cgi-bin/CheckLogin?username=julianr&password=banana` HTTP/1.1 Connection: Keep-Alive

User-Agent: Mozilla/4.0 (compatible; MSIE 4.01; Windows NT)

Host: www.somewhere.com

Accept: image/gif, image/x-bitmap, image/jpeg, image/pjpeg

How did attributes/values got into the URL?

- Can you type them or modify into a browser location box.
- Form whose method attribute is set to GET, will generate parameters based on the name attributes of its input boxes.

```
<form action="cgi-bin/CheckLogin" method="GET">
```

```
Username: <input type="text" name="username">
```

```
Password: <input type="password" name="password">
```

```
<input type="submit" value="Log in">
```

```
</form>
```

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HTTP Post method

- HTTP POST requests are a complement to the GET requests in that they are designed for applications which need to send information to the server, as opposed to querying it.
- Uses

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Whenever there is information to be changed at the server.

Browsers will only accept URLs of a restricted length

Does not use URL to pass parameters like Get

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Typical POST request

POST /cgi-bin/MyProgram HTTP/1.1

User-Agent: Mozilla/4.0 (

compatible;

MSIE 4.01;

Windows NT)

Host: www.somewhere.com

Accept: image/gif, image/x-bitmap,

image/jpeg, image/pjpeg, */

Content-type: application/x-www-form-urlencoded

Content-length: 39

name=julianr&password=green%20bananas

- Header information
- This there is a blank line - this signals the end of the POST request header and the beginning of the extended information.
- The parameters to be passed are part of this extended information.
- Unlike the GET method, POST is not expected to be safe nor idempotent; it can perform modifications to data, and it is not required to be repeatable.

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