**What is HTTP?**

**Introduction**

**Hypertext Transfer Protocol (HTTP)** is an application layer designed within the framework of internet protocol suite. It is used for transferring **text, image, sound, video or any other type of multimedia [files](https://lms.clarusway.com/mod/lesson/view.php?id=1052" \o "Files)**. When a web browser tries to reach a specific web address, it wants to get in touch with the computer holding all the necessary [files](https://lms.clarusway.com/mod/lesson/view.php?id=1052" \o "Files). So basically the client web browser sends an **http request** to get an HTML content or any specific data staying inside the server computer. When the server computer gets the request, it returns an **http response** containing the information requested.

The statement written in the address bar is called **Uniform Resource Locator (URL)**. URLs are the keys to specify a computer and its IP address in the network. The browser should use this key to find out the IP address of a particular computer. The system that is responsible to hold the values of these keys is [**Domain Name System (DNS)**](https://lms.clarusway.com/mod/lesson/view.php?id=943) [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers). If the DNS server knows the address, it answers. Otherwise, the DNS server starts to ask other DNS [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) and fetches the information at the end. Therefore DNS gives it back to the browser and the browser can find the way to the correct destination using HTTP and other related protocols.

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| *Client and server model* |

**HTTP Request and Response**

As mentioned before, HTTP (Hypertext Transfer Protocol) is a request-response protocol. A client on one side (web browser) asks or requests something (a resource located on the server) from a server (a computer responsible to respond to that request) and the server on the other side sends a response to that client. But before this request and response activities, a connection should be established. When we open our browser and write down the URL (Uniform Resource Locator), we are making the first step to connect to the resource. The URL is the address of that resource. It could be a website or a web service, a pdf or anything similar. If we pull apart the URL, we will see the structure like the one below.

URL = http: // host : port / path ? query

The host is the computer where the resource is stored. The host computers are given a human readable alias and this alias defines the IP address of the hosting computer in the URL. The port is the port number of the hosting computer and the path is the address where the resource file is located in the hosting computer. The query parameter is the value we give to the resource file while we try to establish the connection.

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| *Request Message* |

If the URL starts with **HTTP** and there is no port value, the default port number is 80. If it starts with **https**, then the default port number is 443. The **path** and the **query** characters are optional. When the connection is established, the medium is available for transferring the request. But what is this request? A request is a text message and it has 4 parts which are request line, headers (optional), a blank line and a message body (optional).

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| *Request Message Example* |

The server responds to that request with an HTTP response message. The structure of the response message is similar to the request message. The one thing changed is the status line in place of the request line. A status line consists of the protocol version followed by a numeric status code and its associated meaning. Status code element is a 3-digit integer where the first digit of the status code defines the category of response. There are 5 categories. These categories are in its general state are expressed below.

* 1xx -> Informational
* 2xx -> Success
* 3xx -> Redirection
* 4xx -> Client Error
* 5xx -> Server Error

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| *Response Message Example* |

The rest is handled by the browser and its engines.

**Q: What is status code in HTTP?**  
A: It is a standard response code given by web [servers](https://lms.clarusway.com/mod/lesson/view.php?id=1015" \o "Servers) on the Internet. It helps to identify the cause of a problem when a web page or other resource does not load properly. There are two major group of HTTP status code error exist:

* 4xx Client Error
* 5xx Server Error

 - Interview Q&A

**Q: What are the header fields in HTTP?**  
A: HTTP header fields allow the client and server to pass information with the request and response message. Following are the header fields in HTTP:

* **General header:**It applies for both request and response message.
* **Request header:** It contains information for the request message.
* **Response header:** It is used to contain response header information sent by the web server.
* **Entity header:**It is used to contain more information about the body of the entity.

**Certificates and HTTPS**

**SSL** stands for Secure Sockets Layer and, in short, it's the standard technology for keeping an internet connection secure and safeguarding any sensitive data that is being sent between two systems, preventing criminals from reading and modifying any information transferred, including potential personal details. The two systems can be a server and a client (for example, a shopping website and browser) or server to server (for example, an application with personal identifiable information or with payroll information).

**TLS** (Transport Layer Security) is just an updated, more secure, version of SSL. We still refer to our security certificates as SSL because it is a more commonly used term.

**HTTPS** (Hyper Text Transfer Protocol Secure) appears in the URL when a website is secured by an SSL certificate. The details of the certificate, including the issuing authority and the corporate name of the website owner, can be viewed by clicking on the lock symbol on the browser bar.

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| *Secure HTTP* |

**Q: What are SSL certificates?**  
A: SSL is a standard security protocol which ensures confidentiality and integrity of data while in transit. It encrypts the data flow between the web browser and web server, hence ensures confidentiality. Also, web server and browser exchanges key to decrypt the data, which ensures the integrity of data.

 - Interview Q&A

**Q: What are the benefits of HTTPS certificate?**A: The major benefits of HTTPS certificate are:

* Customer information like credit card number and ATM pin is encrypted and cannot be easily tracked.
* Customers trust and prefer to purchase from the sites that use HTTPS protocol.
* This protocol shows authenticate register domain as secure connection.