**WEB SERVICES**

420-511-VA

#### **LAB-2-**

In this LAB students are supposed to look more into HTTP and related technologies.

Students are supposed to research information on their own and give a brief and comprehensive answer, each in their own words.

1. Describe what was done in LAB-1:

|  |
| --- |
| In Lab 1.1, we used sockets to understand how programs communicate. The same IP address and port were used because it was done on the same machine. And in Lab 1.2 we tried to imitate how the communication between a web browser and an HTTP server works using the programs that were used in Lab1.1. We added request lines in program 1 and response lines in program 2. In the second part of Lab 1.2, we tried communicating with Apache through port 80 and modifying some lines in the programs to see what the response will be. |

1. What is HTTP?

|  |
| --- |
| HTTP is a protocol that is used to transfer resources (HTML files, audio files, images, etc.) between a client and a server. |

1. To what layer in the TCP/IP stack does HTTP belong?

|  |
| --- |
| In the TCP/IP stack, HTTP belong in the Application Layer. |

1. What other protocols belong to the same layer as HTTP?

|  |
| --- |
| Application layer contains several protocols namely Telnet, FTP, NFS, TFTP, SMTP, SNMP, DNS, LPD, X window and DHCP. |

1. Which organization maintains and develops HTTP? include a link to the official HTTP specifications:

|  |
| --- |
| TheWorld Wide Web Consortium (W3C) <https://www.w3.org/> |

1. What is the current version in use of HTTP and what will be the next version?

|  |
| --- |
| HTTP/2 is the current version in use of HTTP and HTTP/3 will be the next version. |

1. HTTP is responsible for establishing client/server connection and handling communication error checking, correct?

|  |
| --- |
| No, it is the TCP (Transmission Control Protocol) that is responsible for establishing client/server connection and handling communication error checking. |

1. What are the two types of HTTP Messages?

|  |
| --- |
| The two types of HTTP messages are request and response. |

1. What is the application that is used by users to handle HTTP requests and responses over the internet?

|  |
| --- |
| API (Application Programming Interface) is used by users to handle HTTP requests and responses over the internet. |

1. What does MIME type mean, give examples?

|  |
| --- |
| A MIME type is a label that is used to classify/identify a type of data. It is used so that a software can know how to handle the data. Some examples are application/javascript  application/json, application/xml, audio/mpeg, audio/webm, image/gif, image/jpeg, text/css, text/html, text/javascript, video/mp4, and many more. |

1. What is a Media Type and what is the difference between MIME type and Media Type?

|  |
| --- |
| Media Type is the proper technical term while MIME Type is the former name for Media Type. |

1. What is an URI, a URL and what is the difference between the two?

|  |
| --- |
| URL is a type of URI. It helps to identify a web resource using the location. Meanwhile, URI helps to identify a web resource either by name, location or both. URI the superset of URL. |

1. Could we specify the TCP port number in a URL, give an example?

|  |
| --- |
| Yes, we could specify the TCP port number in a URL. An example is <https://abcd.com:8041> wherein 8041 is the port number in a URL. |

1. Could the Web Server and Web Browser establish a secure connection using a username and password, what would be the format of the URL give an example?

|  |
| --- |
| Yes, the web server and web browser could establish a secure connection using a username and password through the use of SSL/TLS and HTTPS. An example is <https://www.example.org> |

1. What is an HTTP Request composed of? It is usually sent by which application to which application? Give an example of a request:

|  |
| --- |
| An HTTP request is made out of three components: request line, headers and message body. It is usually sent by a client (mobile app or another web service or web application) to a server (HTTP)  An example of a request is:  GET /hello.htm HTTP/1.1  User-Agent: Mozilla/4.0 (compatible; MSIE5.01; Windows NT)  Host: www.tutorialspoint.com  Accept-Language: en-us  Accept-Encoding: gzip, deflate  Connection: Keep-Alive |

1. What is an HTTP Response composed of? It is usually sent by which application to which application? Give an example of a response:

|  |
| --- |
| An HTTP response is composed of three components: status line, response header and response body. It is usually sent by a server (HTTP) to a client (mobile app or another web service or web application)  An example of an HTTP response is:  http://www.tcpipguide.com/free/diagrams/httpresponse.png |

1. What is the first line of an HTTP Request called, and what goes on it, give an example?

|  |
| --- |
| The first line of an HTTP Request is called a Request Line. An example Is GET /doc/test.html HTTP/1.1 |

1. What is the first line of an HTTP Response called, and what goes on it, give an example?

|  |
| --- |
| The first line of an HTTP Response is called a Status Line. An example is HTTP/1.1 200 OK |

1. What are HTTP Methods, or verbs, for?

|  |
| --- |
| HTTP Methods or verbs define what action the client wants to be performed on the identified resource. To simplify, each method/verb defines exactly what the client wants to happen on the identified resource when sent to a server. |

1. List five main commonly used HTTP Methods and state their purpose:

|  |
| --- |
| GET is used to request data from a specified resource.  POST is used to send data to a server to create/update a resource.  PUT is used to send data to a server to create/update a resource.  HEAD is almost identical to GET, but without the response body  DELETE method deletes the specified resource. |

1. What are HTTP Headers, what are they composed of, give an example?

|  |
| --- |
| HTTP headers are used to pass additional information between the clients and the server through the request and response header.  HTTP headers are composed of request or response line, and MIME header   * For an HTTP request line, it contains a method, URL, and version. And for an HTTP response line, it contains a version, status code, and reason phrase.   An example of an HTTP header:  GET /tutorials/other/top-20-mysql-best-practices/ HTTP/1.1  Host: code.tutsplus.com  User-Agent: Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US; rv:1.9.1.5) Gecko/20091102 Firefox/3.5.5 (.NET CLR 3.5.30729)  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8  Accept-Language: en-us,en;q=0.5  Accept-Encoding: gzip,deflate  Accept-Charset: ISO-8859-1,utf-8;q=0.7,\*;q=0.7  Keep-Alive: 300  Connection: keep-alive  Cookie: PHPSESSID=r2t5uvjq435r4q7ib3vtdjq120  Pragma: no-cache  Cache-Control: no-cache |

1. What is ‘content-type’, is it included in Requests or Responses, give an example?

|  |
| --- |
| Content-Type is used to indicate the media type of the resource. It is included in responses.  An example is: |

1. What is an HTTP Status Code, give three sample Status Codes and their meanings:

|  |
| --- |
| An HTTP status code is a server response to a browser's request.   * 401 – Not Authorized: The request needs user authentication. * 200 – OK: The request succeeded. * 500 – Server Error: Due to a malfunctioning script, server configuration error or similar. |

1. What does the HTTP Body contain?

|  |
| --- |
| It contains the actual data that is needed to be fetch. |

1. The HTTP Body must be enclosed within the tags <body></body>, correct?

|  |
| --- |
| No, it is not mandatory to enclose the HTTP Body within the tags <body> </body>. It could be empty. |

1. What Data formats could be included in the HTTP Body?

|  |
| --- |
| The HTTP Body can contain HTML code or an image or CSS stylesheets, JavaScript files depending on the resource of the request. |

1. Could the HTTP Body contain data of a document or Video file, in what format?

|  |
| --- |
| Yes, for document is it xml and JSON. And for video file it would be mp3, webm, and ogg. |

1. The information included in HTTP Requests and Responses are binding and reliable, for example if the browser receives a response with a header field “server: Apache” it is guaranteed that the web server is an Apache server?

|  |
| --- |
| No, it is not guaranteed that it is an Apache server because it is possible to change the web server name to an Apache server. Someone can create a custom header and customize the server’s name or the expiration date of a response. |

1. How does the browser tell the Web Server what content types it can read, give an example?

|  |
| --- |
| The Accept request HTTP header indicates which content types, expressed as MIME types, that the client can understand.  An example is:    Accept: text/html, application/xhtml+xml, application/xml;q=0.9, \*/\*;q=0.8 |

1. A Browser must download all objects related to a Web page in one HTTP transaction. Is that correct?

|  |
| --- |
| No, a browser needs to make separate HTTP transaction for every single object on a webpage. |

1. What are the major components of a Web Browser?

|  |
| --- |
| The major components of a Web Browser are User Interface, Browser Engine, Networking, JavaScript Interpreter. |

1. What is AJAX and what is it used for, what are its benefits?

|  |
| --- |
| AJAX stands for Asynchronous JavaScript and XML. It is a technique for creating a quicker, more interactive websites. It is used to communicate with the server without refreshing the web page which provides a better performance and increases user experience.  The benefits of AJAX are reduce server traffic and increase speed, enable asynchronous calls, XMLHttpRequest, reduce bandwith usage, and immediate form validation. |

1. What is the XMLHttpRequest, and what is it used for?

|  |
| --- |
| XMLHttpRequest is a request type that is widely used for sending a request to Ajax pages. It plays an important role in the implementation of Ajax techniques for web development. It is used to interact with servers. |

1. What is a canonical URL, give an example?

|  |
| --- |
| A canonical URL is an HTML element which helps prevent duplicate content by informing search engines to prefer one document over other identical or similar documents.  A canonical URL located in the <head> section of the page source looks like this:  <head>  <link rel="canonical" href="https://www.contentkingapp.com/" />  </head> |

**REFERENCE BOOK**

HTTP: the definitive guide

1st ed. / Gourley, David.

O'Reilly, 2002.

ISBN: 9781565925090