02: HTTP basics on headers, MIME types, & cookies for Java developers

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Q1. What happens when you open up a browser and type a URL to request a Web page or RESTFul web service data?
A1. HTTP is a stateless protocol on top of TCP (Transmission Control Protocol).

1) When the IP address is obtained, the browser will attempt to open a TCP connection to the web server, usually on port 80.

2) Once the TCP connection is made, the browser will issue an **HTTP request** to the server using the connection.

3) The HTTP request comprises a **header** section, and possibly a **body** section, which is where POST data go, and in GET request the parameters are passed in the URI.

4) Once the request is sent, the browser will wait for the response.

5) When the web server has assembled the response, it is sent back to the browser for rendering. The HTTP response consists of a header section and a body. The header section tells the browser how to treat the body content and the browser renders the content for viewing. Each HTTP response includes a status code, which indicates the status of the request.

6) "headers" are sent before the actual page content. These headers are invisible, but can be viewed via development tools like Firefox plugins and in Chrome with "Developer tools". The browser uses the **Content-Type header** to determine the type of data sent like text, xml, json, etc. This is also known as the **MIME type** of the particular Web resource.

7) The common response status codes include, 200 OK, 404 NOT FOUND, 500 Internal Error, etc.

8) Most HTTP responses will also contain references to other objects within the body that will cause the browser to automatically request these objects as well. Web pages often contain more than 50+ other object references like style sheets (i.e. CSS), images, JavaScript files, etc to complete the page. Your browser will create additional TCP connections for these referenced references. For example, 2 to 3 connections per host.

The basic request is comprised of

1) a method –> GET, POST, PUT, DELETE, HEAD, and OPTIONS
2) the URI (Uniform Resource Indicator) –> a RESTFul API ends up being simply a collection of URIs. To read a customer with Customer ID# 725,

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http://www.myhost.com/customers/725
3) HTTP version desired –> 1.0 or 1.1

Q2. What are HTTP headers? Why do you need them?
A2. HTTP headers carry information about behavior between the browser and the web server. The headers are sent by the web server to tell the browser how to treat the content. For example, the "**Content-Type**" header tells what type of data to expect XML, JSON, HTML, etc. The "**Content-Disposition**" header tells browser to display the content on the browser (i.e. inline) or as a download (i.e. attachment) to be saved on to the file system with a popup window.

"**Connection**: Keep-Alive" header will reuse TCP connections for subsequent requests and will save on the latency incurred especially in applications that utilize Web 2.0 technology such as AJAX (Asynchronous JavaScript and XML) to perform real-time updates of content as it reduces the overhead associated with opening and closing TCP connections.

Cookies are sent by the web server to the browser as an HTTP header and used to store all sorts of information about a user's interaction with the site. A cookie is a small plain text file without any executable code that is stored by a browser on the user's machine. A web server specifies a cookie to be stored by sending an HTTP header called Set-Cookie.

```
1  HTTP/1.0 200 OK
2 Content-type: text/html
3 Set-Cookie: name=value
4 Set-Cookie: name2=value2; Expires=Wed, 09 Jun 202
5
```

When a cookie is present, and the optional rules allow, the cookie value is sent to the server with each subsequent request. The cookie value is stored in an HTTP header called **Cookie**.

Q3. What is an HTTP-Only cookie?
A3. The idea behind HTTP-only cookies is to instruct a browser that a cookie should never be accessible via JavaScript through the **document.cookie** property. This

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feature was designed as a security measure to help prevent **cross-site scripting (XSS)** attacks perpetrated by stealing cookies via JavaScript.

Q4. How will you go about debugging the data sent from the server on the client-side like header info, cookies, resources sent, debugging CSS, JavaScript, etc?
A4. With the help of browser debug tools like Fire fox plugins like FireBug, Live HTTP Headers, Modify Headers or in **Chrome More Tools** –> **Developer Tools** from the main. menu.

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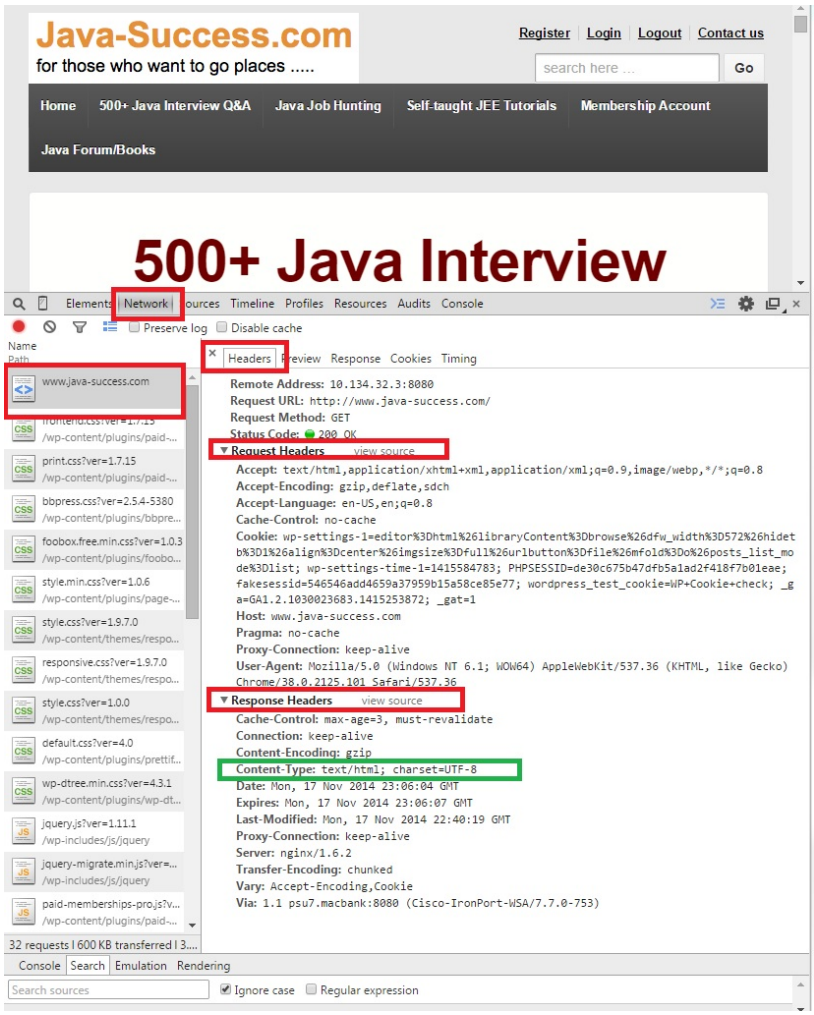
Type: www.java-success.com on Google chrome and then press “Ctrl+Shift+I for the interactive development” split/popup window.



Client side debugging of HTTP

Here is a Java Web Service server/client code snippet

Using “response.header(“Content-Disposition”, “attachment; filename=test.csv”);” on the server side and “client.type(“text/csv”).accept(“text/csv”);” on the client side with **MIME type headers**.

On the Java Server side RESTFul Web service snippet

```
1 //...
2
```

```
@Path("/downloadservice/")
@Produces("application/xml")
public interface FileDownloadWebService {

  @GET
  @Path("/get/{id}")
  public DownloadFileInformation getFileInform
}

```

```
//....
public class FileDownloadWebServiceImpl imple

  private FileDownloadService downloadService;

  @Override
  public Response getFile(long id) {
    FileUpload fileInfo = downloadService.get
    ResponseBuilder response = Response.ok(ne
    response.header("Content-Disposition", "att
    return response.build();
  }

}

```

On the Java client side snippet

```
  //..
  public String invokeRestfulWs(....) {

    String errorMsg = null;
    FileWriter fw = null;
    BufferedReader br = null;

    try {

      String urlAddress = "http://myhost:8080

      WebClient client = WebClient.create(url
      //headers
      client.type("text/csv").accept("text/csv")
      InputStream is = client.get(InputStream

      int index = fileNameToDownload.indexOf(

      //writ back to file system
      String fileNameToSave = fileNameToDownl

      File file = new File(localDir + File
      fw = new FileWriter(file);

      InputStreamReader isr = new InputStrea
      br = new BufferedReader(isr);

      String read = br.readLine();

      while (read != null){
        fw.write(read);
        logger.info(read);
```

```
33          read = br.readLine();
34        }
35
36
37      } catch (Exception e) {
38        logger.error("Error Downloading: " + e
39        errorMsg = "Error Downloading: " + e
40      } finally {
41        try {
42          br.close();
43          fw.close();
44        } catch (IOException e) {
45          e.printStackTrace();
46        }
47      }
48
49      return errorMsg;
50
51    }
52
```

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