#### **Week 14 HW: WEB DEVELOPMENT**

#### **HTTP Requests and Responses**

Answer the following questions about the HTTP request and response process.

1. What type of architecture does the HTTP request and response process occur in?  
   Client-Server Architecture
2. What are the different parts of an HTTP request?  
   Request Line, Headers, Whitespace
3. Which part of an HTTP request is optional?  
   Query Parameters
4. What are the three parts of an HTTP response?  
   Status Line, Headers, Whitespace, Response Body
5. Which number class of status codes represents errors?  
   400
6. What are the two most common request methods that a security professional will encounter?  
   GET and POST
7. Which type of HTTP request method is used for sending data?  
   POST
8. Which part of an HTTP request contains the data being sent to the server?  
   Headers
9. In which part of an HTTP response does the browser receive the web code to generate and style a web page?  
   Response Body

#### **Using curl**

Answer the following questions about curl:

1. What are the advantages of using curl over the browser?  
   No UI required, can be automated.
2. Which curl option is used to change the request method?  
   -x
3. Which curl option is used to set request headers?  
   -h
4. Which curl option is used to view the response header?  
   --head
5. Which request method might an attacker use to figure out which HTTP requests an HTTP server will accept?  
   POST JSON

#### **Sessions and Cookies**

Recall that HTTP servers need to be able to recognize clients from one another. They do this through sessions and cookies.

Answer the following questions about sessions and cookies:

Which response header sends a cookie to the client?  
  
 HTTP/1.1 200 OK

Content-type: text/html

1. Set-Cookie: cart=Bob ←

Which request header will continue the client's session?  
  
 GET /cart HTTP/1.1

Host: www.example.org

1. Cookie: cart=Bob ←

#### **Example HTTP Requests and Responses**

Look through the following example HTTP request and response and answer the following questions:

**HTTP Request**

POST /login.php HTTP/1.1

Host: example.com

Accept-Encoding: gzip, deflate, br

Connection: keep-alive

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

Content-Length: 34

Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (Linux; Android 6.0; Nexus 5 Build/MRA58N) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/80.0.3987.132 Mobile Safari/537.36

username=Barbara&password=password

1. What is the request method?  
   POST
2. Which header expresses the client's preference for an encrypted response?  
   Unencrypted
3. Does the request have a user session associated with it?  
   No
4. What kind of data is being sent from this request body?  
   Username & Password

**HTTP Response**

HTTP/1.1 200 OK

Date: Mon, 16 Mar 2020 17:05:43 GMT

Last-Modified: Sat, 01 Feb 2020 00:00:00 GMT

Content-Encoding: gzip

Expires: Fri, 01 May 2020 00:00:00 GMT

Server: Apache

Set-Cookie: SessionID=5

Content-Type: text/html; charset=UTF-8

Strict-Transport-Security: max-age=31536000; includeSubDomains

X-Content-Type: NoSniff

X-Frame-Options: DENY

X-XSS-Protection: 1; mode=block

[page content]

1. What is the response status code?  
   200 - OK
2. What web server is handling this HTTP response?  
   Unencrypted
3. Does this response have a user session associated with it?  
   Yes
4. What kind of content is likely to be in the [page content] response body?  
   HTML file
5. If your class covered security headers, what security request headers have been included?  
   Strict-Transport-Security header

#### **Monoliths and Microservices**

Answer the following questions about monoliths and microservices:

1. What are the individual components of microservices called?  
   API’s
2. What is a service that writes to a database and communicates to other services?  
   Back-end server
3. What type of underlying technology allows for microservices to become scalable and have redundancy?  
   Containers

#### **Deploying and Testing a Container Set**

Answer the following questions about multi-container deployment:

1. What tool can be used to deploy multiple containers at once?  
   Docker Compose
2. What kind of file format is required for us to deploy a container set?  
   YAML

#### **Databases**

1. Which type of SQL query would we use to see all of the information within a table called customers?  
   SELECT \* FROM CUSTOMERS;
2. Which type of SQL query would we use to enter new data into a table? (You don't need a full query, just the first part of the statement.)

*INSERT INTO table\_name*

*VALUES*

*(val1, val2,val3 … );*

1. Why would we never run DELETE FROM <table-name>; by itself?

The correct query must be

DELETE FROM *table\_name* WHERE *condition*;

The WHERE clause specifies which record(s) should be deleted. If you omit the WHERE clause, all records in the table will be deleted.