## **Week 14 Homework: Web Development**

### **Overview**

In this homework, we will review the many of the concepts and tools covered in the Web Development unit. If needed, refer to the reference sheets provided to you.

* HTTP Reference Sheet
* curl Reference Sheet

### **Questions**

Before you work through the questions below, please create a new file and record your answers there. This will be your homework deliverable.

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

#### **Using curl**

Answer the following questions about curl:

1. What are the advantages of using curl over the browser?
   1. Test Web Servers Security Configurations
   2. Ensure Web Servers don’t leak sensitive data through HTTP responses
   3. Verify that servers only respond to certain requests
   4. Look for vulnerabilities on web servers
2. Which curl option is used to change the request method?
   1. Curl {domain/anything}
3. Which curl option is used to set request headers?
   1. Curl -h
4. Which curl option is used to view the response header?
   1. Curl {domain} --head
5. Which request method might an attacker use to figure out which HTTP requests an HTTP server will accept?
   1. Connect

#### **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
   1. Set-Cookie

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

Host: www.example.org

1. Cookie: cart=Bob
   1. 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?
   1. Post
2. Which header expresses the client's preference for an encrypted response?
   1. Upgrade-Insecure-requests:1
3. Does the request have a user session associated with it?
   1. Yes
4. What kind of data is being sent from this request body?
   1. Log In request

**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?
   1. 200 - Success
2. What web server is handling this HTTP response?
   1. Apache
3. Does this response have a user session associated to it?
   1. No
4. What kind of content is likely to be in the [page content] response body?
   1. Text/html
5. If your class covered security headers, what security request headers have been included?
   1. X-Content-Type: NoSniff
   2. X-Frame-Options: DENY
   3. X-XSS-Protection: 1; mode=block

#### **Monoliths and Microservices**

Answer the following questions about monoliths and microservices:

1. What are the individual components of microservices called?
   1. Clients
   2. Identity Providers
   3. API Gateway
   4. Messaging Formats
   5. Databases
   6. Static Content
   7. Management
   8. Service Discover
2. What is a service that writes to a database and communicates to other services?
   1. C.R.U.D (Create.Read.Update.Delete)
3. What type of underlying technology allows for microservices to become scalable and have redundancy?
   1. 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?
   1. Docker Compose
2. What kind of file format is required for us to deploy a container set?
   1. YAML

#### **Databases**

1. Which type of SQL query would we use to see all of the information within a table called customers?
   1. SQL SELECT
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.)
   1. INSERT INTO [table name]
3. Why would we never run DELETE FROM <table-name>; by itself?
   1. Because all records would be deleted.