Cybersecurity

Module 12 Challenge Submission File

Web Development

Make a copy of this document to work in, and then respond to each question below the prompt. Save and submit this completed file as your Challenge deliverable.

HTTP Requests and Responses

1. What type of architecture does the HTTP request and response process occur in?

```
client-server
```

2. What are the parts of an HTTP request?

```
Request line, header, whitespace
```

3. Which part of an HTTP request is optional?

```
Request body
```

4. What are the three parts of an HTTP response?

```
Status line, header, whitespace, & usually a response body
```

5. Which number class of status codes represents errors?

```
400s for client errors, 500s for server errors
```

6. What are the two most common request methods a security professional encounters?

```
GET and POST
```

7. Which type of HTTP request method is used to send data?

```
POST
```

8. Which part of an HTTP request contains the data being sent to the server?

```
The body
```

9. In which part of an HTTP response does the browser receive the web code to generate and style a webpage?

```
Response body
```

Using curl

10. What are the advantages of using `curl` over the browser?

```
A server you need to access may not have a website or GUI, so using curl
will allow you to access that site w/o the use of a browser, which would be
unable to do so.
```

11. Which `curl` option changes the request method?

```
-X
```

12. Which `curl` option sets request headers?

```
-H
```

13. Which `curl` option is used to view the response header?

```
--include
```

14. Which request method might an attacker use to figure out what HTTP requests an HTTP server will accept?

```
OPTIONS
```

Sessions and Cookies

15. Which response header sends a cookie to the client?

```
HTTP/1.1 200 OK
Content-type: text/html
Set-Cookie: cart=Bob

The set-cookie HTTP response header sends the cookie from the server to
client.
```

16. Which request header will continue the client's session?

```
GET /cart HTTP/1.1
Host: www.example.org
Cookie: cart=Bob

The Cookie HTTP request header in the example above will continue the
client's session.
(Another potential header could be the connection keep-alive HTTP request
header which will keep a client's session/connection open.)
```

Example HTTP Requests and Responses

Use the following sample HTTP request and response to answer the questions in this section:

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
```

17. What is the request method?

```
POST
```

18. Which header expresses the client's preference for an encrypted response?

```
Upgrade-Insecure-Requests
```

19. Does the request have a user session associated with it?

```
No
```

20. What kind of data is being sent from this request body?

```
Login details, username and 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]
```

21. What is the response status code?

```
200 OK
```

22. What web server is handling this HTTP response?

```
Apache
```

23. Does this response have a user session associated with it?

```
Yes, SessionID=5
```

24. What kind of content is likely to be in the [page content] response body?

```
The data in response to the original request such as html code and other
data that comprises the webpage
```

25. If your class covered security headers, what security request headers have been included?

```
We did not cover these in class. However, through additional research I have
located the following common security request headers:
Strict-Transport-Security
Content-Security-Policy
X-Frame-Options
```

Monoliths and Microservices

26. What are the individual components of microservices called?

```
Service discovery, load balancer, API gateway, service registry, circuit
breaker, service monitoring service orchestration, configuration server,
containers
```

27. What is a service that writes to a database and communicates to other services?

```
Write service (aka command service)
```

28. What type of underlying technology allows for microservices to become scalable and have redundancy?

```
Load balancers/containers
```

Deploy and Test a Container Set

29. What tool can you use to deploy multiple containers at once?

```
docker
```

30. What kind of file format is required to deploy a container set?

```
.yml
```

Databases

31. Which type of SQL query would you use to view all the information in a table called `customers`?

```
SELECT * FROM customers
```

32. Which type of SQL query would you use to enter new data into a table? (You don't need a full query, just the first part of the statement.)

```
INSERT INTO
```

33. Why would you never run `DELETE FROM <table-name>;` by itself?

```
This would delete the entire table
```

Optional Additional Challenge Activity: The Cookie Jar

Question 1: Did you see any obvious confirmation of a login? (Y/N)

```
N
```

Question 2: How many items exist in this file?

```
4
```

Question 3: Is it obvious that you can access the dashboard? (Y/N)

```
N
```

Question 4: Look through the output where `Dashboard` is highlighted. Does any of the wording on this page seem familiar? (Y/N) If so, you should be successfully logged in to your Editor's dashboard.

```
Y
```

Question 5: What happens this time?

"You need a higher level of permission. Sorry, you are not allowed to list users."

Sources:
https://www.invicti.com/blog/web-security/http-security-headers/
https://www.optisolbusiness.com/insight/8-core-components-of-microservice-architecture

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