

Week 14 Homework: Web Development

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?
 - HTTP request and response occurs in the client server.
2. What are the different parts of an HTTP request?
 - The different parts of an HTTP request are the request header, request line, and request bodies.
3. Which part of an HTTP request is optional?
 - The request body
4. What are the three parts of an HTTP response?
 - The three parts of an HTTP response are the same as those of the request: request header, request line, and request body.
5. Which number class of status codes represents errors?
 - 400 and 500
6. What are the two most common request methods that a security professional will encounter?
 - Post / Get
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?
 - The body of the Request.
9. In which part of an HTTP response does the browser receive the web code to generate and style a web page?
 - The body of the Response

Using curl

Answer the following questions about `curl`:

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

- Advantages of curl are the ability to automatically test HTTP requests, manage request / responses, and support many protocols without an interface.

11. Which `curl` option is used to change the request method?

- `Curl -X`

12. Which `curl` option is used to set request headers?

- `Curl -h`

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

- `Curl -i`

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

- `Get` or `options`

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:

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

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

- `Set-Cookie`

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

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

- `Cookie` continues the session.

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

17.What is the request method?

- Post

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

- Accept-Encoding: deflate, br, gzip

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

- The request does not need to have a user session.

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

- Login credentials

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

22.What web server is handling this HTTP response?

- apache server

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

- yes sessionid=5

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

- web code

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

- Strict Transport Security

Monoliths and Microservices

Answer the following questions about monoliths and microservices:

26. What are the individual components of microservices called?

- Services

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

- API service

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

- Load Balancers

Deploying and Testing a Container Set

Answer the following questions about multi-container deployment:

29. What tool can be used to deploy multiple containers at once?

- Docker Compose

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

YAML

Databases

31. Which type of SQL query would we use to see all of the information within a table called customers?

- `SELECT column_name FROM customers`

32. 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 (column_1, column_2, column_3) VALUES (value_1, value_2, value_3)`

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

- Doing so will delete the entire table.