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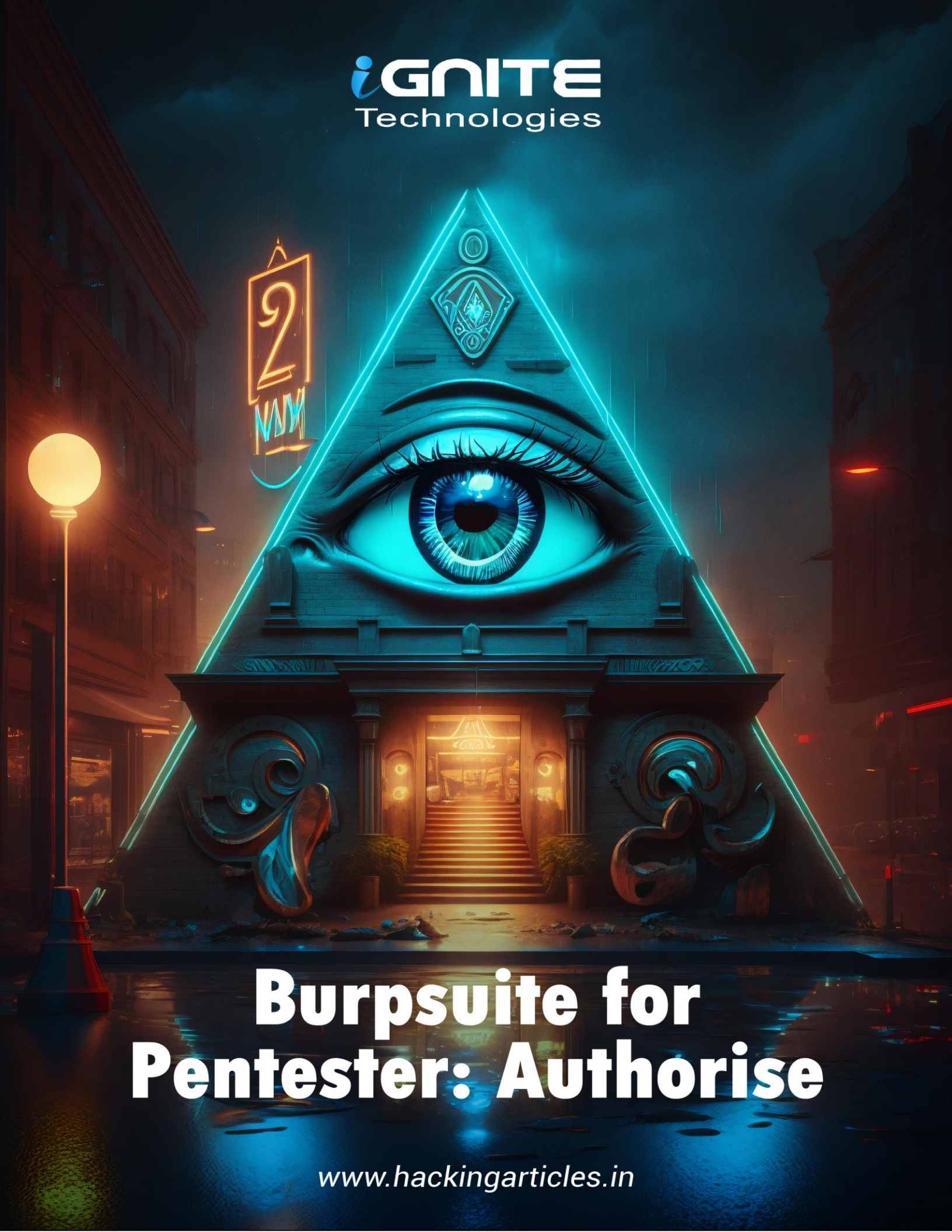


Burpsuite for Pentester: Authorise

www.hackingarticles.in

Contents

Burpsuite for Pentester: Authorize

In order to protect online assets, web application security testing is an essential element of safeguarding them. Burp Suite has been a leader in this area for many years and it's still being used by safety professionals as well as Ethical hackers. One of those extensions that stands out in the web security testing community is "Autorize", which comes with a wide variety of additional features to improve its capabilities. A powerful set of features that simplify the authentication and authorization testing process is available with this extension.

Autorize = Authenticate + Authorize

Authorization includes any method by which a system grants or revokes permission to access specific data or actions. Meanwhile, Authentication is a process by which an individual or system authenticates themselves as being who they claim to be.

- Common vulnerabilities detected by Autorize
- Understanding the Functionality
- Installation and Setup
- Navigation and Configuration options
- Practical Demonstration of Autorize in Action

Common vulnerabilities detected by Autorize

It is primarily focused on identifying authorization-related vulnerabilities. It can help to identify some of the main types of vulnerabilities, such as:

- **Inadequate Role-Based Access Control (RBAC)**: It can uncover issues where user roles or permissions are not properly enforced, allowing users to access functionality or data they shouldn't have access to.
- **Broken Access Controls**: It can identify instances where access controls are not correctly implemented, leading to unauthorized access to resources or actions.
- **Insecure Direct Object References (IDOR)**: It can find situations where attackers can manipulate input to access other users' data or perform actions they shouldn't be able to.
- **Forced Browsing**: It can help identify cases where an attacker can navigate directly to restricted areas of the application by manipulating URLs.
- **Insufficient Authorization**: It may detect situations where user roles or permissions are not properly enforced, allowing unauthorized actions to be performed.
- **Horizontal and Vertical Privilege Escalation**: It can find vulnerabilities that enable attackers to escalate their privileges within the application, either by impersonating other users or gaining additional permissions.
- **Business Logic Flaws**: Autorize may discover business logic vulnerabilities, where application workflows can be manipulated in unintended ways, potentially leading to unauthorized actions or data exposure.

Remember that the effectiveness of Autorize depends on how well it is configured and your tests are carried out.

Understanding the working of Autorize

Let’s understand how Autorize works. Suppose, for instance, a web application implements user-based roles and supports cookie-based authentication.

Normal User: has access to general functionality but is not allowed to access admin functions and database (read-only access).

Admin User: has access to all functionality (read/write access).

Capture the normal user cookies and add them to Authorize. Re-log in with the Admin user access all the admin functionality and update some data to the database.

What will Autorize be doing now? Autorize is capturing all requests and changing the administrator cookie with your normal user's cookies when you are browsing an application, then sending them to server. See the server response, if the server behaves in the same way as legitimate Admin (like 200 OK in response) and no errors have been detected. The request was highlighted as a Red Bypass! Another request shows as a Green Enforced!.

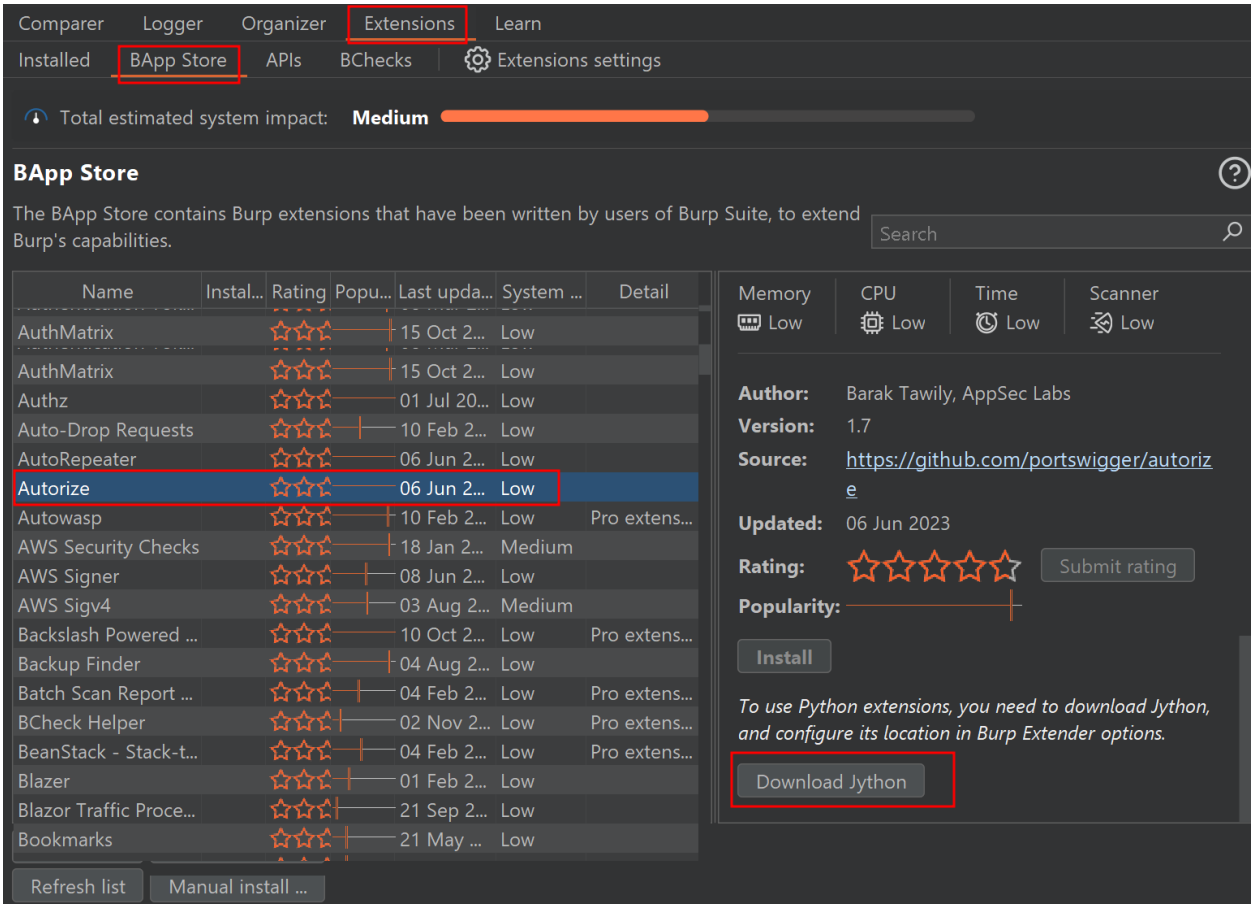
For every request sent to the server from a client, it will perform an automated test. With a large application, with over 30+ dynamic webpages, it's going to ease our work. There are a lot of URLs you need to test manually, so Autorize will do it for you.

Similarly, Autorize also detects an API endpoint problem in the same way. The authentication method must be checked for the API. Let's say an API uses a JWT token, you can control that by modifying its authorization header and identifying the authentication bypass issues with the APIs.

Installation and Setup

From the Bapp Store, you can download and install the extension. Select Bapp Store in Extensions. You can search for ‘Authorize’, or you can just look down. Click on it, scroll down to the right side.

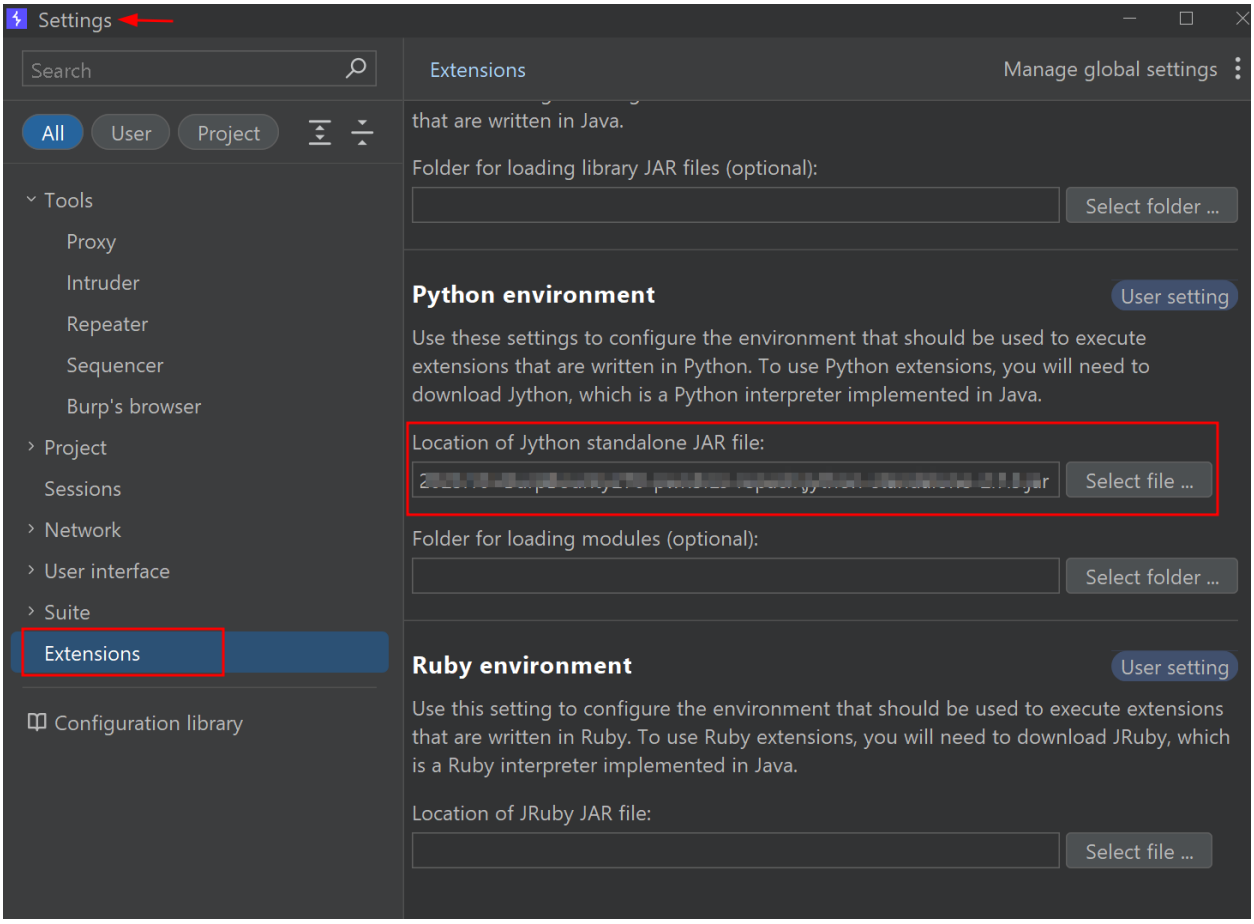
The extension is built in Python, you will see that 'Jython' needs to be installed first.



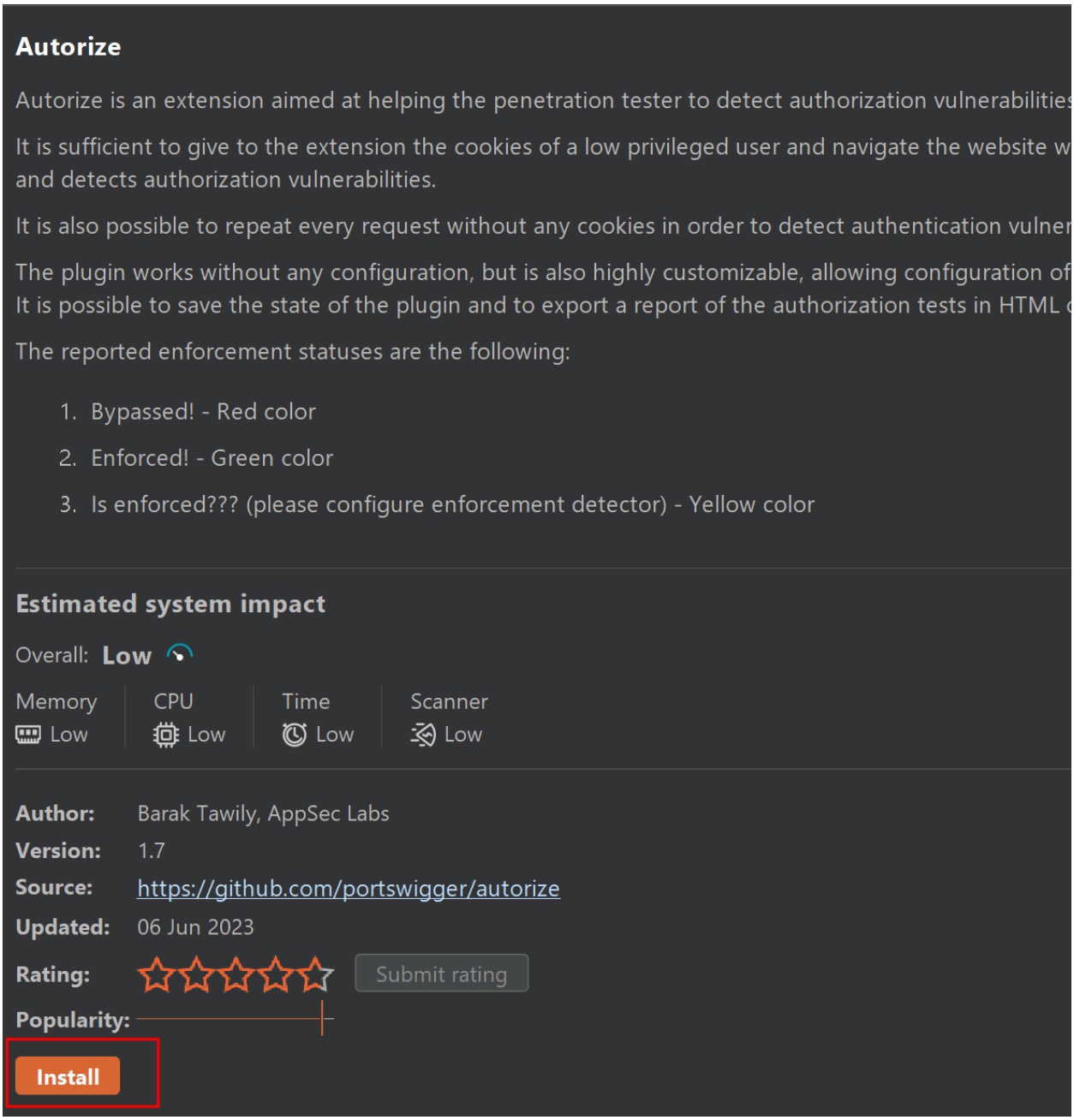
Browse the below link and download 'Jython Standalone'.

Refer this link: https://www.jython.org/download.html

After downloading go to Setting > Extension > on the right side under Python Environment browser the Jython file. This environment has been successfully set up for Jython.



Restart the Burp program and follow this path to install Authorize on BApp Store. You'll notice that the install button is highlighted. You can click on it and install it.

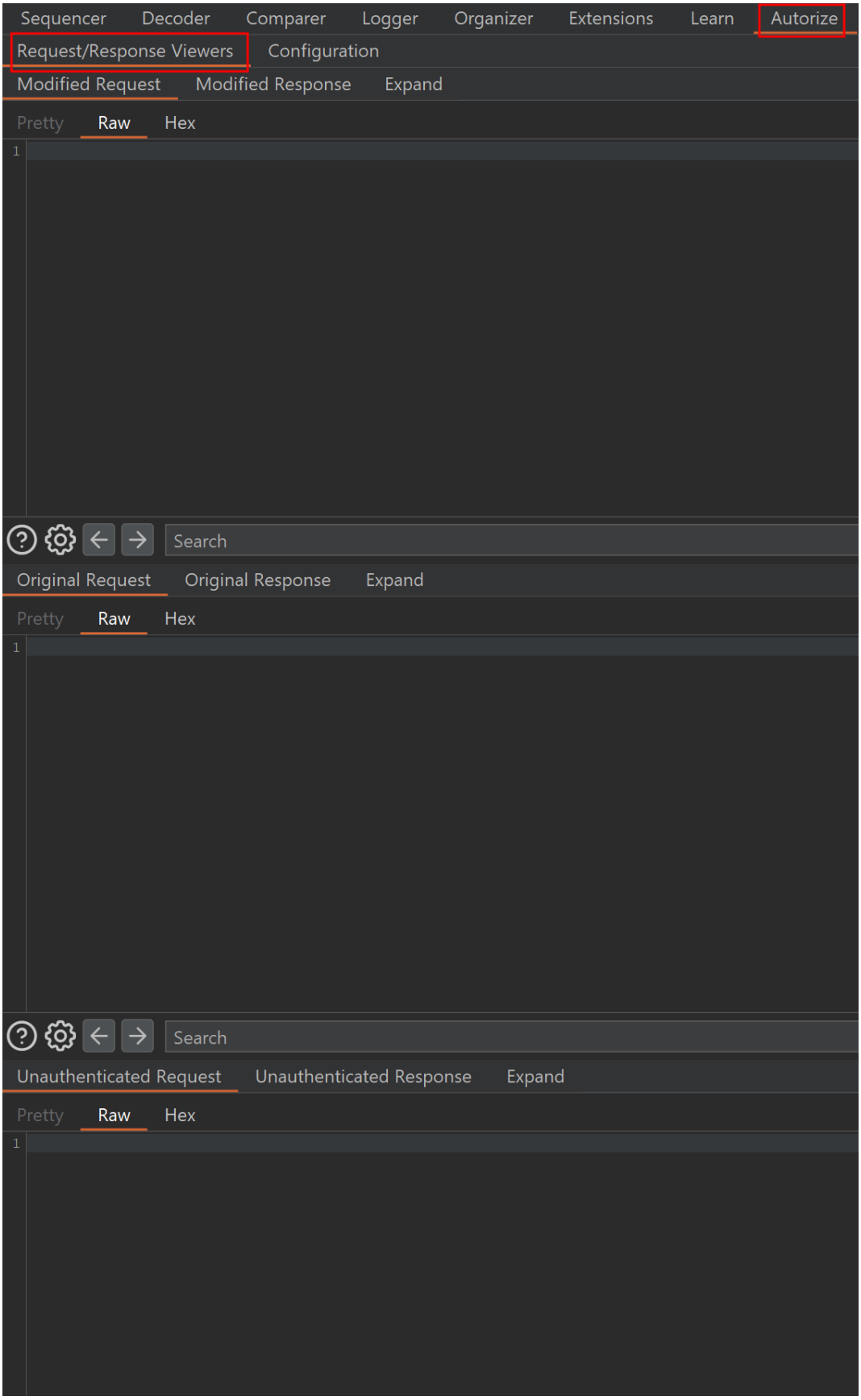


The Authorize tab will appear in the bar after successful installation.

Navigating and Configuration Options

There are two tabs under the Authorize section, the first one is Request/Response Viewers tab and the other one Configuration tab.

Request/Response Viewers: The Request/Response tab will display complete information about the particular request you capture within Authorize and choose. The manipulated request will be displayed under the Modified Request section, the Original Request tab will display the original/unmodified request, and the Unauthenticated request will display the unauth request.

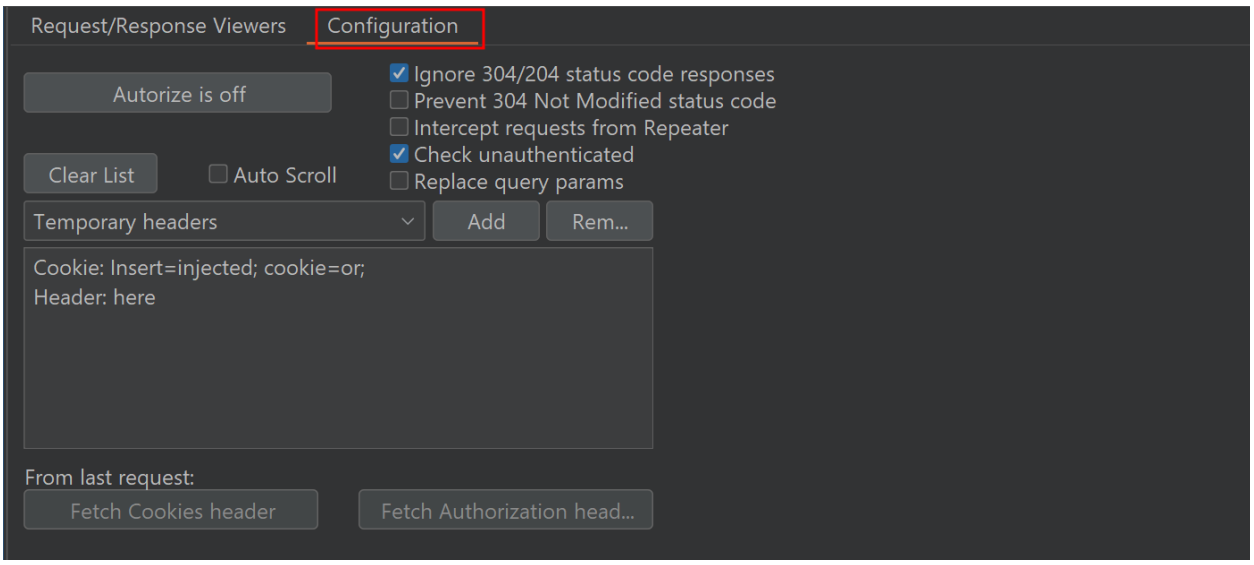

Sequencer
Decoder
Comparer
Logger
Organizer
Extensions
Learn
Autorize
Request/Response Viewers
Configuration
Modified Request
Modified Response
Expand
Pretty
Raw
Hex
Search
Original Request
Original Response
Expand
Pretty
Raw
Hex
Search
Unauthenticated Request
Unauthenticated Response
Expand
Pretty
Raw
Hex

Configuration: Under the configuration tab you will see Autorize is off by default, when you are ready to capture the request first put Autorize on. There are also some configurations for capturing a request and server status code. Depending on your preference, you can select it.

Here, under the Temporary header box; you need to put the normal user token/cookies/header value that you want to replace within the actual request i.e. if any application is using a JWT token for auth mechanism you need to put that value here.

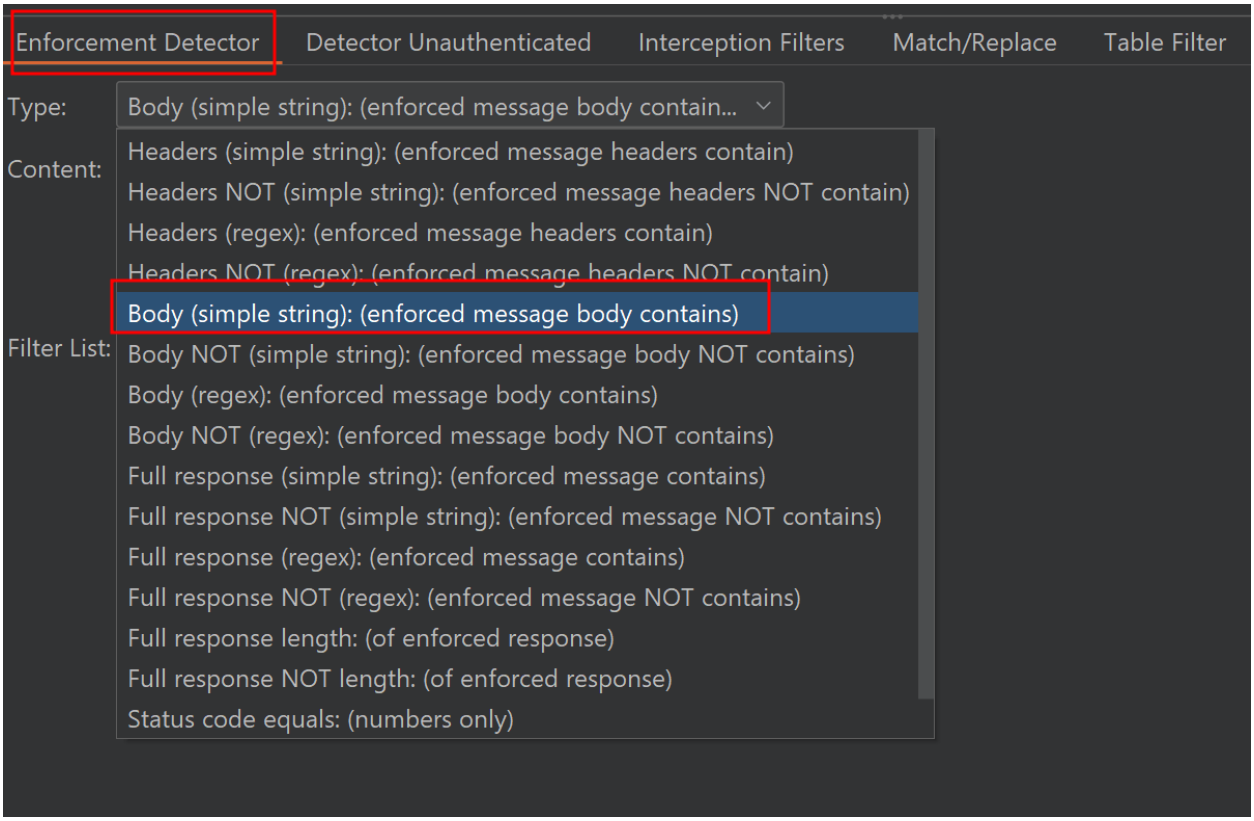
Either you can manually add the auth value or below is the option to fetch it from the last request. If you want to add the cookies header from the last request – click on 'Fetch Cookies header' or If you want to add Authorization header – click on 'Fetch Authorization header'.

Generally, the session cookies are under Cookies Header and the auth token comes under Authorization Header.



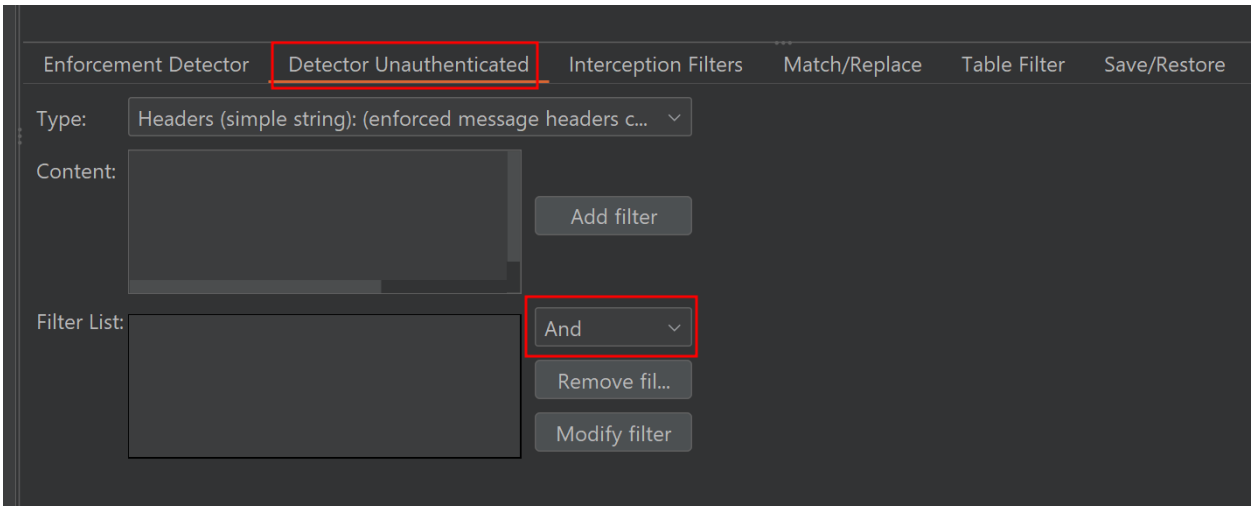
Once the session cookies are loaded, it is essential to instruct Authorize on which requests to intercept and establish the standard behavior for the application when dealing with unauthorized requests or those with insufficient permissions.

Commencing with the Enforcement Detector, input a characteristic of the application's response that can be anticipated when a user with limited privileges tries to perform an action they lack sufficient permissions. In my practice, I've found that utilizing the "Body (simple string): enforced message body contains" option is the simplest to set up and functions effectively. Choose the type and content that aligns with your specific needs and remember to click the "Add filter" button.

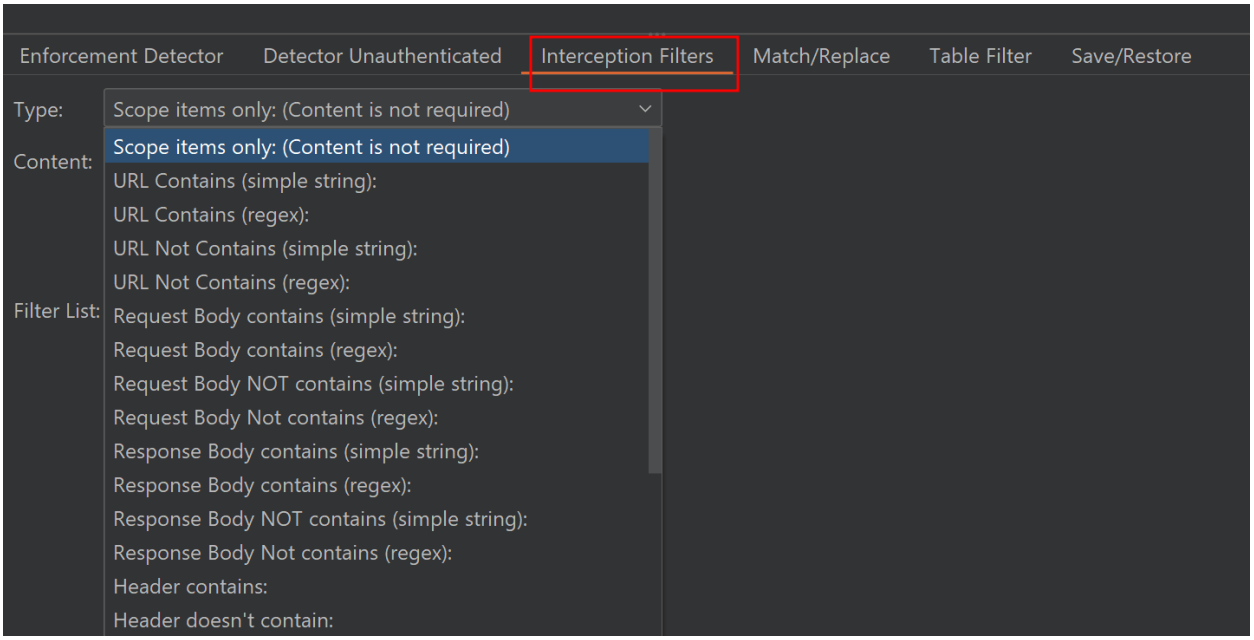


Moreover, it is necessary to understand that it automatically sets the default comparison to "And" when assessing multiple filters. Therefore, if the application generates distinct error messages, such as one for trying to read a file and another for attempting to access administrative features, you should create a filter for each scenario and switch the "And" to "Or."

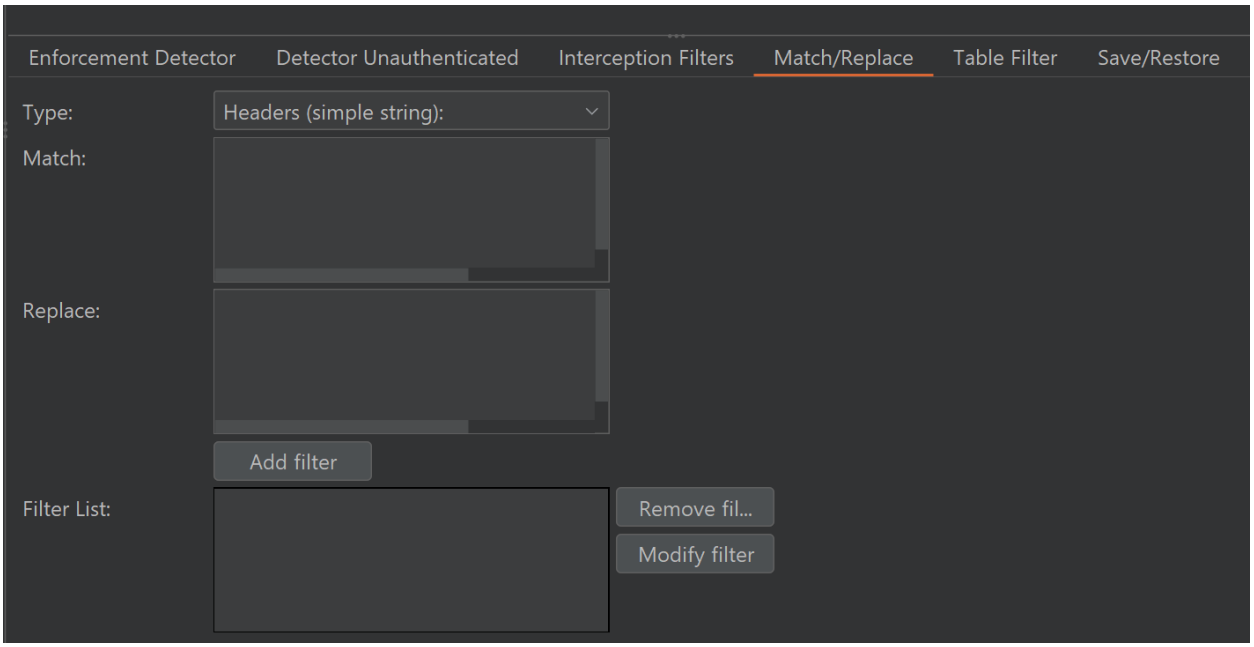
Follow the same procedure for the Unauthenticated Detector



The interception filter will intercept “Scope items only” regardless of content and from those requests, it will ignore spider requests and URLs containing image extensions. You may select on your preference and click “Add filter” when type is selected.

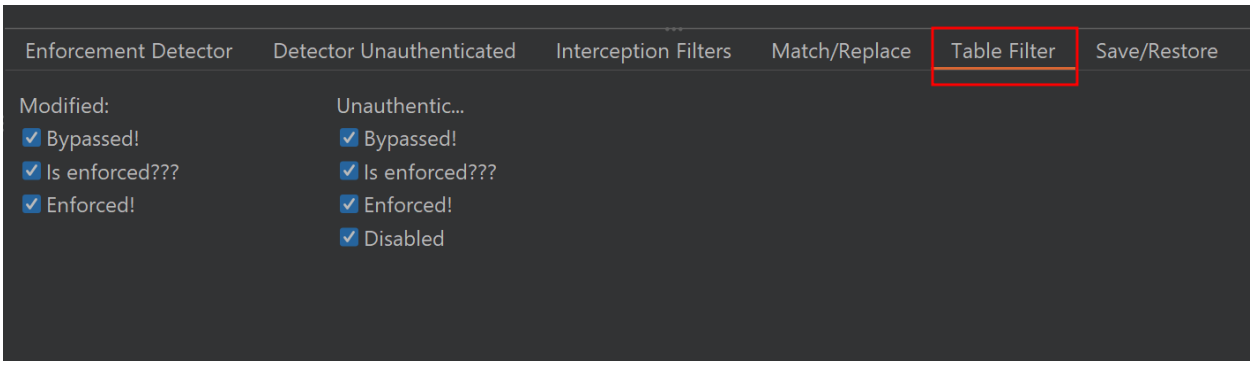


This is another additional feature Match/Replace. You can select it from this site if you need to change any specific header or body parameter on the Autorize request. Suppose there is a parameter name 'u.name' on the request body, and it has to be replaced by an Admin EID i.e.:=”a.name”) for proper access circumvention. You can tell Autorize via adding here.

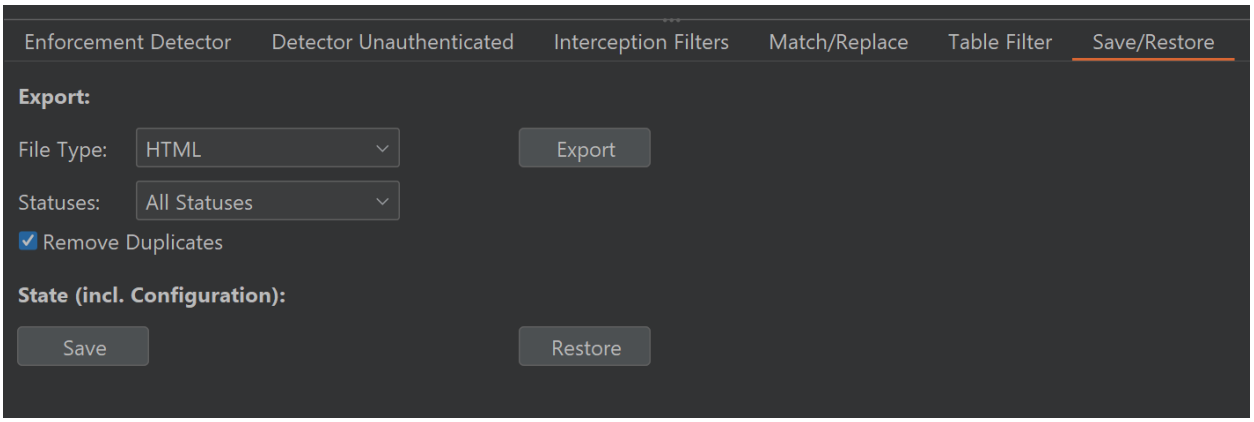


You can select the type of requests that you want to see under the Table Filter bar,

- bypassed!: the endpoint may be vulnerable to IDOR,
- Is enforced!: endpoint seems to be protected but re-check once,
- Enforcing!: against IDOR, the endpoint is clearly protected.



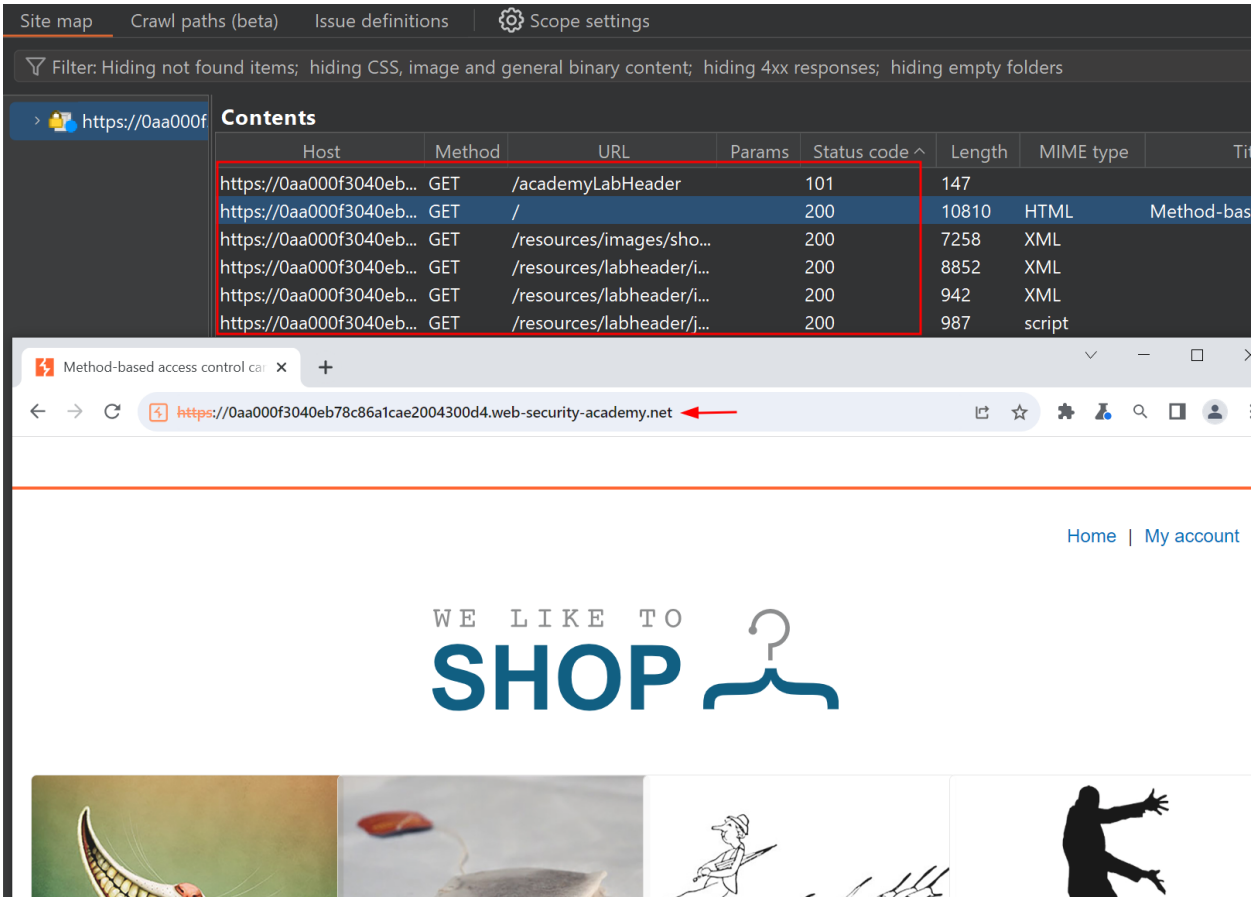
You can save and export the data for further analysis under the Save/Restore tab.



Practical Demonstration of Autorize in Action

Let's do a quick demonstration to understand in an easy way, to perform this practical we are going to use a pre-setup Port Swigger lab “Method-based access control can be circumvented”. Click on access the lab and browser the application.

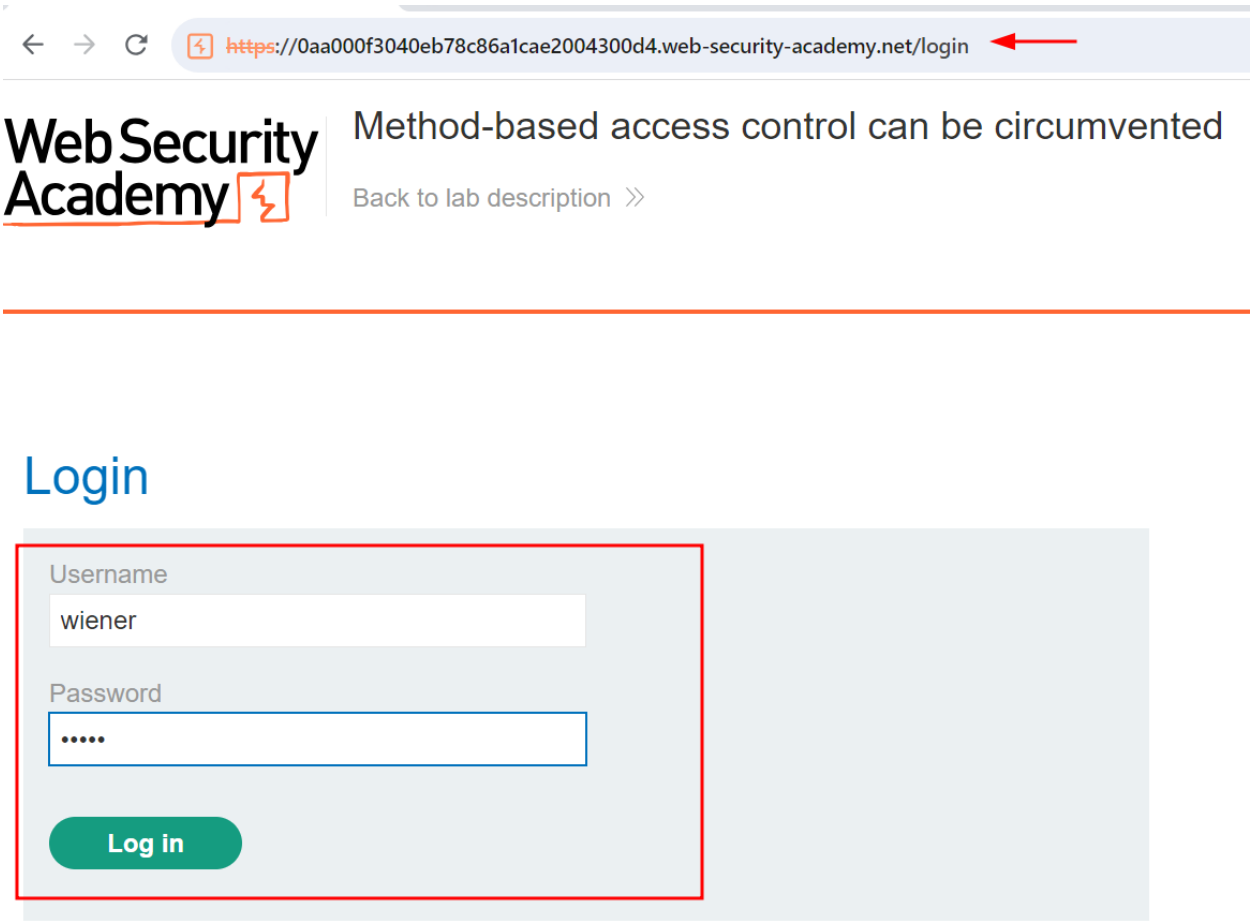
This will show a Broken Access Control vulnerability with two users that have different role higher and lower privilege users. The same concept can be applied to same-level users.



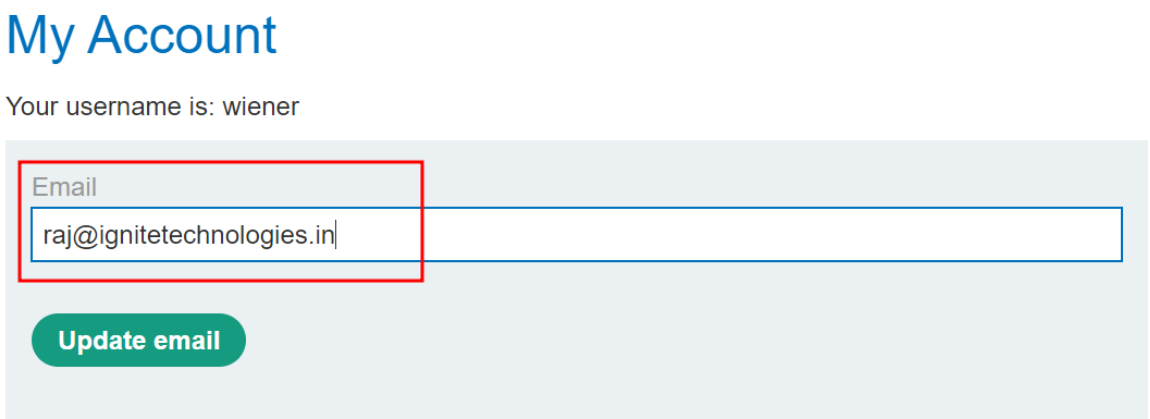
First, we have to capture the cookies for low privileged user (normal user). We are using the default normal user credentials,

Wiener:peter

And logged into the application to capture session cookie.



Updated some more details.



You will see the below capture session cookie in to the login request. Now copy this cookie header.

1 ×

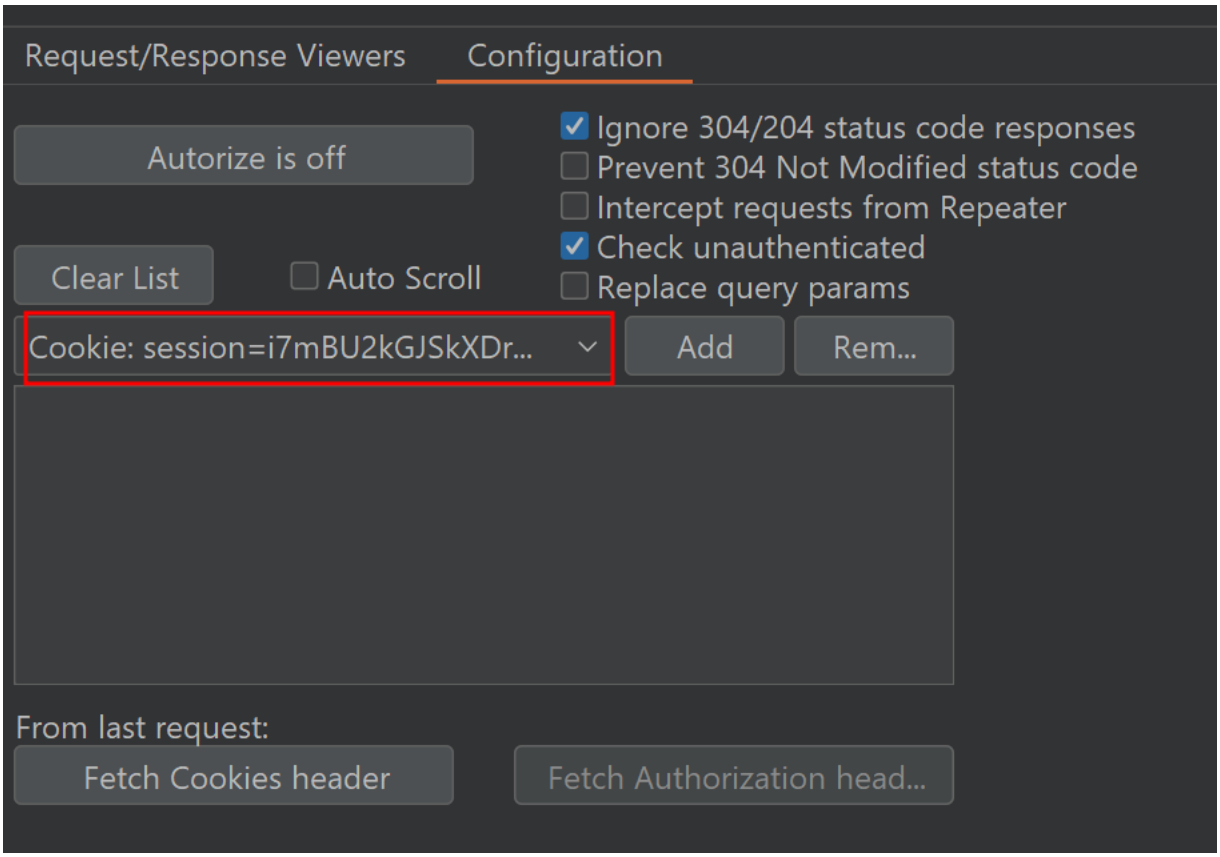
Send Cancel

Request

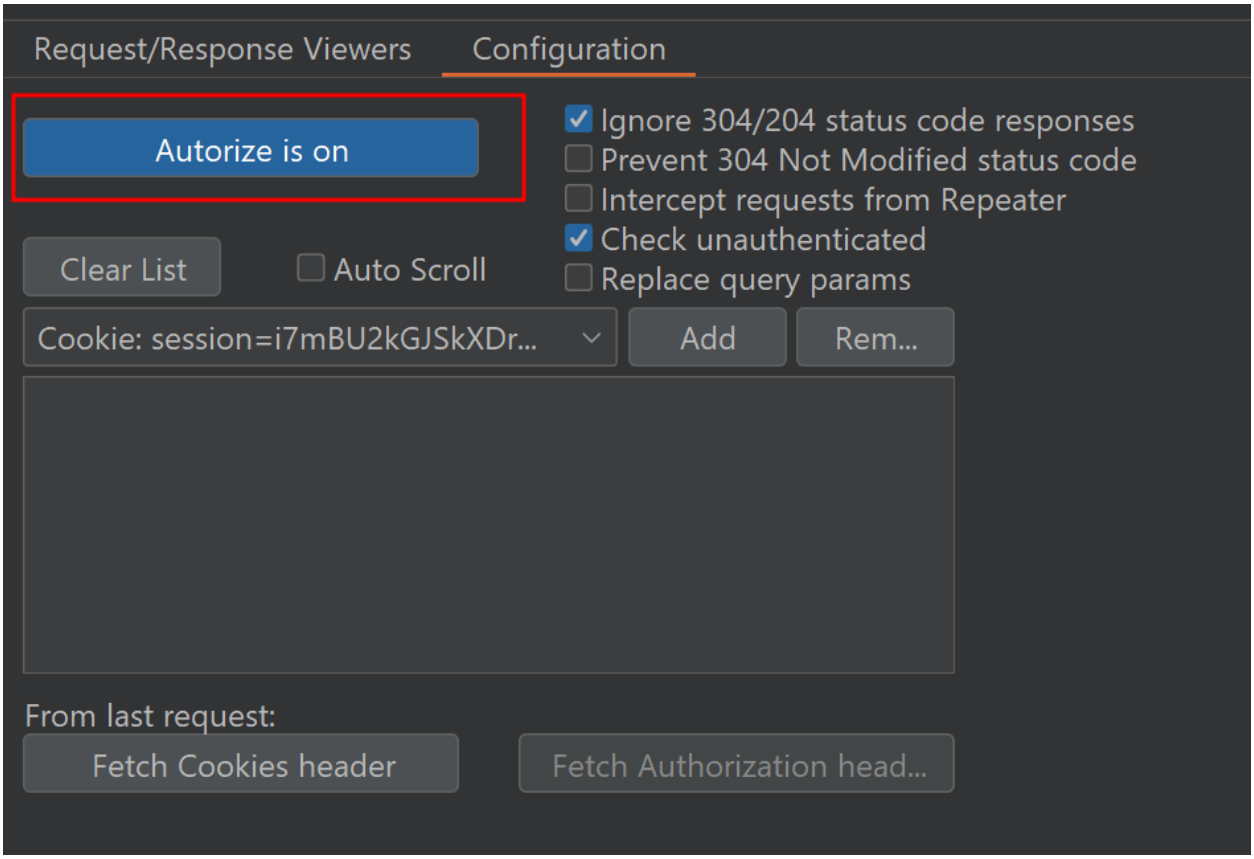
Pretty Raw Hex

```
1  POST /login HTTP/2
2  Host: 0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net
3  Cookie: session=i7mBU2kGJSkXDrFhmTT1XuKokr63zvKx
4  Content-Length: 30
5  Cache-Control: max-age=0
6  Sec-Ch-Ua:
7  Sec-Ch-Ua-Mobile: ?0
8  Sec-Ch-Ua-Platform: ""
9  Upgrade-Insecure-Requests: 1
10 Origin: https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net
11 Content-Type: application/x-www-form-urlencoded
12 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko
13 Accept:
   text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;
   0.7
14 Sec-Fetch-Site: same-origin
15 Sec-Fetch-Mode: navigate
16 Sec-Fetch-User: ?1
17 Sec-Fetch-Dest: document
18 Referer: https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net/login
19 Accept-Encoding: gzip, deflate, br
20 Accept-Language: en-US,en;q=0.9
21
22 username=wiener&password=peter
```

Add this cookie header value to Autorize tab as shown below,

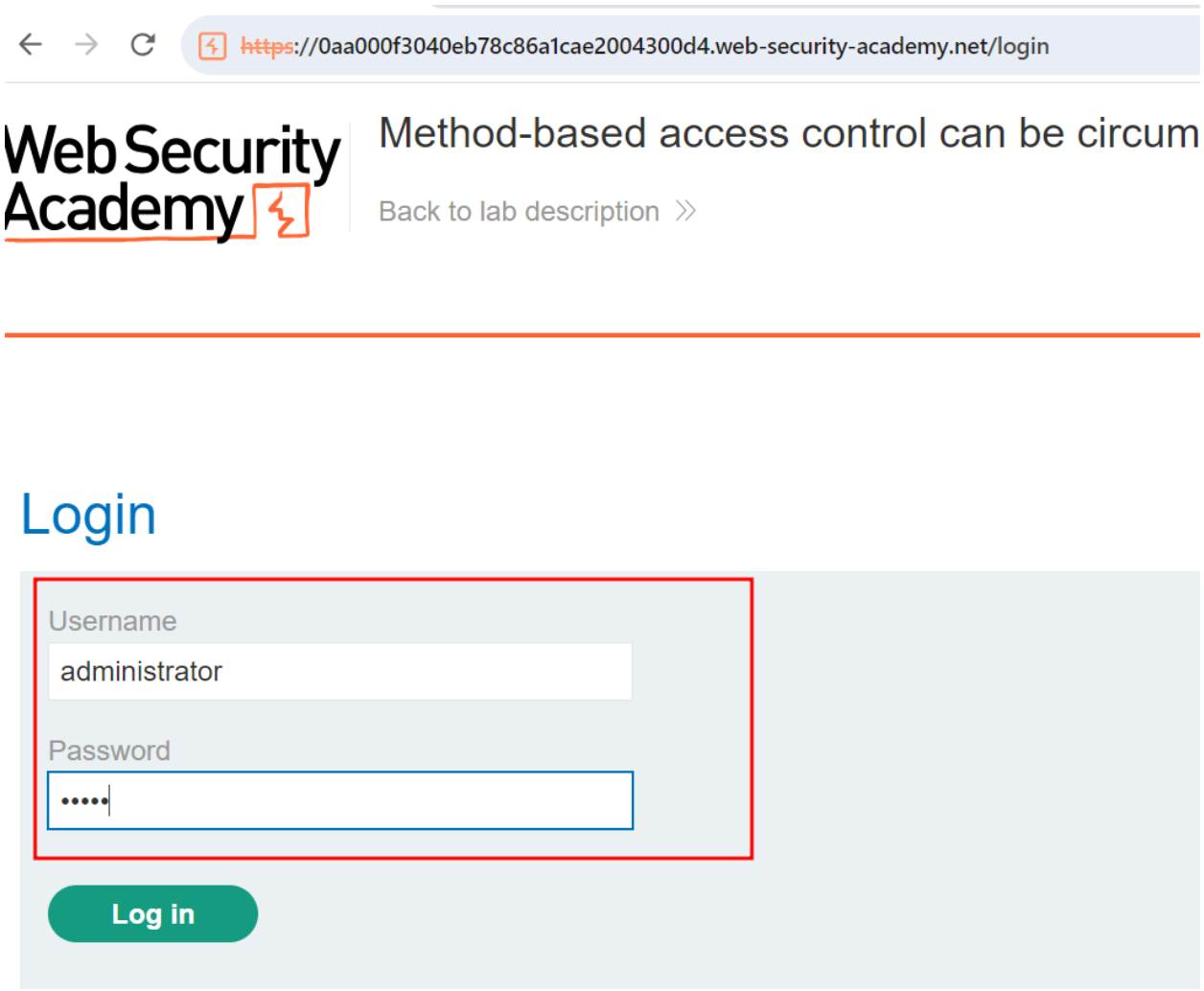


And keep Autorize on.



In order to, check the auth bypass now we have to log in with high privilege (admin user). Go to login page again and use admin credentials to log in,

Administrator:admin



After successfully logging in and browsing the all admin-only URLs. You can see under the Autorize tab some highlighted requests

The **Authz. Status** indicates which endpoints are accessible to wiener (normal user).

The **Unauth. Status** pertains to unauthorized users, effectively eliminating the cookie and all authorization headers. You can opt to disable this feature by deselecting the "Check unauthenticated" option in the Autorize configuration tab.

Red [Bypassed!] : endpoint could be vulnerable to access control/IDOR issues.

Orange [Is enforced!] : endpoint seems to be protected but cross-check manually by replacing the cookies value.

Green [Enforced!] : endpoint is clearly protected against access control/IDOR issues.

...	...	URL	...	...	...	Authz. Status	Unauth. Status
1	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/login	0	0	0	Bypassed!	Bypassed!
2	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/my-account?id=administrator	...	...	...	Bypassed!	Bypassed!
3	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/academyLabHeader	0	...	...	Enforced!	Enforced!
4	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/admin	...	...	...	Bypassed!	Bypassed!
5	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/academyLabHeader	0	...	...	Enforced!	Enforced!
6	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/admin-roles	0	0	0	Bypassed!	Bypassed!
7	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/admin	...	...	...	Bypassed!	Bypassed!
8	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/academyLabHeader	0	...	...	Enforced!	Enforced!
9	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/admin-roles	0	0	0	Bypassed!	Bypassed!
...	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/admin	...	...	...	Bypassed!	Bypassed!
...	...	https://0aa000f3040eb78c86a1cae2004300d4.web-security-academy.net:443/academyLabHeader	0	...	...	Enforced!	Enforced!

As visible in above image, request 1, 2, 6, and 7 are having Broken access control issue.

Keep in mind that do not blindly follow the Autorize result, The Red highlight requests do not mean that all endpoints are vulnerable or bypassed. There may be false positives; You must do a cross-check.

Some other possible scenarios, Suppose you are testing auth issues with the two same level of users. As a result, you will see Authz. Status shows Bypassed! And Unauth. Status shows Enforced! In that case improper authorization can be found on the request which shows that the specific endpoint can be accessed by the 2nd user but has correctly implemented authorization for any unauthorized users.

When you select any highlighted request, on the right side you will see the detailed information about modified, original & unauthenticated request and responses.

Organizer Extensions Learn Autorize

Request/Response Viewers Configuration

Modified Request Modified Response Expand

Pretty Raw ex

```
1 POST /my-account/change-email HTTP/2
2 Host: 0a2000f4041f53818018353200cb00fd.web-security-academy.net
3 Content-Length: 34
4 Cache-Control: max-age=0
5 Sec-Ch-Ua:
6 Sec-Ch-Ua-Mobile: ?0
7 Sec-Ch-Ua-Platform: ""
8 Upgrade-Insecure-Requests: 1
9 Origin: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net
10 Content-Type: application/x-www-form-urlencoded
11 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML,
12 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/w
13 Sec-Fetch-Site: same-origin
14 Sec-Fetch-Mode: navigate
15 Sec-Fetch-User: ?1
16 Sec-Fetch-Dest: document
17 Referer: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net/my-ac
18 Accept-Encoding: gzip, deflate, br
19 Accept-Language: en-US,en;q=0.9
20 Cookie: session=eO2BUCQvmsEIqb87XJBCiACSHSdXD9YS
21
```

Search

Original Request Original Response Expand

Pretty Raw Hex

```
1 POST /my-account/change-email HTTP/2
2 Host: 0a2000f4041f53818018353200cb00fd.web-security-academy.net
3 Cookie: session=dxqZCSrDns2hw1OFoRl866ROgo4Gv6Cb
4 Content-Length: 34
5 Cache-Control: max-age=0
6 Sec-Ch-Ua:
7 Sec-Ch-Ua-Mobile: ?0
8 Sec-Ch-Ua-Platform: ""
9 Upgrade-Insecure-Requests: 1
10 Origin: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net
11 Content-Type: application/x-www-form-urlencoded
12 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML,
13 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/w
14 Sec-Fetch-Site: same-origin
15 Sec-Fetch-Mode: navigate
16 Sec-Fetch-User: ?1
17 Sec-Fetch-Dest: document
18 Referer: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net/my-ac
19 Accept-Encoding: gzip, deflate, br
20 Accept-Language: en-US,en;q=0.9
21
```

Search

Unauthenticated Request Unauthenticated Response Expand

Pretty Raw Hex

```
1 POST /my-account/change-email HTTP/2
2 Host: 0a2000f4041f53818018353200cb00fd.web-security-academy.net
3 Content-Length: 34
4 Cache-Control: max-age=0
5 Sec-Ch-Ua:
6 Sec-Ch-Ua-Mobile: ?0
7 Sec-Ch-Ua-Platform: ""
8 Upgrade-Insecure-Requests: 1
9 Origin: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net
10 Content-Type: application/x-www-form-urlencoded
11 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML,
12 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/w
13 Sec-Fetch-Site: same-origin
14 Sec-Fetch-Mode: navigate
15 Sec-Fetch-User: ?1
16 Sec-Fetch-Dest: document
17 Referer: https://0a2000f4041f53818018353200cb00fd.web-security-academy.net/my-ac
18 Accept-Encoding: gzip, deflate, br
19 Accept-Language: en-US,en;q=0.9
20
21 email=rrai%40ignitetechnologies.in
```

Search

That's a wrap for now. Cheers!

Conclusion

For carrying out comprehensive security reviews, the "Autorize Burp" extension is an essential tool. By automating authentication and enabling the testing of restricted areas, it enhances the efficiency and effectiveness of security assessments. This extension is an indispensable tool for conducting comprehensive tests and identifying potential vulnerabilities that may only be accessible to authenticated users.

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