Ex. No:
Date:

Aim:

To create a simple REST API using python to do the GET, POST, PUT and DELETE operations

Algorithm:

Step 1: Start

Step 2: Install Flask

Step 3: Start the Flask App

Step 4: Use Postman to Test Endpoints

Step 5: View Server Output

Step 6: Stop

Program:

```
from flask import Flask, jsonify, request
app = Flask(__name__)
# Sample data
data = [
{'id': 1, 'name': 'Item 1'},
{'id': 2, 'name': 'Item 2'},
{'id': 3, 'name': 'Item 3'}
]
# GET request to retrieve all items
@app.route('/items', methods=['GET'])
def get_items():
return jsonify({'items': data})
# GET request to retrieve a specific item by ID
@app.route('/items/<int:item_id>', methods=['GET'])
def get_item(item_id):
item = next((item for item in data if item['id'] == item_id), None)
if item:
return jsonify({'item': item})
```

Name:
Register Number:

Ex. No:
Date:

```
else:
return jsonify({'message': 'Item not found'}), 404
# POST request to add a new item
@app.route('/items', methods=['POST'])
def add_item():
new_item = {'id': len(data) + 1, 'name': request.json['name']}
data.append(new_item)
return jsonify({'item': new_item}), 201
# PUT request to update a specific item by ID
@app.route('/items/<int:item_id>', methods=['PUT'])
def update_item(item_id):
item = next((item for item in data if item['id'] == item_id), None)
if item:
item['name'] = request.json['name']
return jsonify({'item': item})
else:
return jsonify({'message': 'Item not found'}), 404
# DELETE request to remove a specific item by ID
@app.route('/items/<int:item_id>', methods=['DELETE'])
def delete_item(item_id):
global data
data = [item for item in data if item['id'] != item_id]
return jsonify({'message': 'Item deleted'}), 200
if __name__ == '__main__':
app.run(debug=True)
```

Name:
Register Number:

Ex. No:
Date:

Procedure and Output:

Step 1: Install Flask

>>>pip install flask

Step 2: Start the Flask App

Save the code as app.py and execute

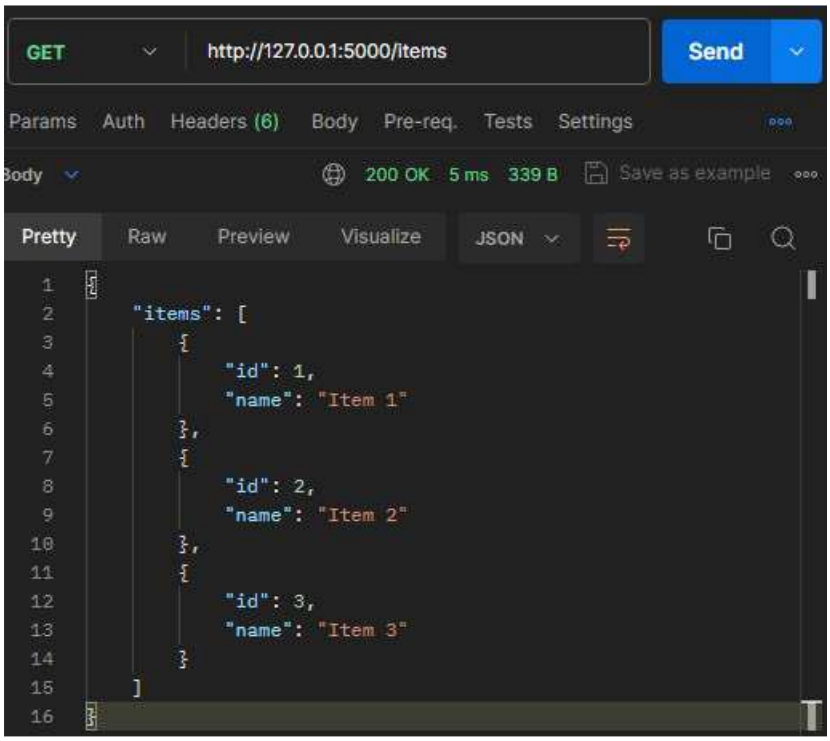
>>>python app.py

Copy the url produced http://127.0.0.1:5000

Step 3: Use Postman to Test Endpoints

1. GET Request to Retrieve All Items:

- Set the request type to **GET**.
- Enter the URL: **http://127.0.0.1:5000/items**
- Click "Send."



2. GET Request to Retrieve a Specific Item by ID:

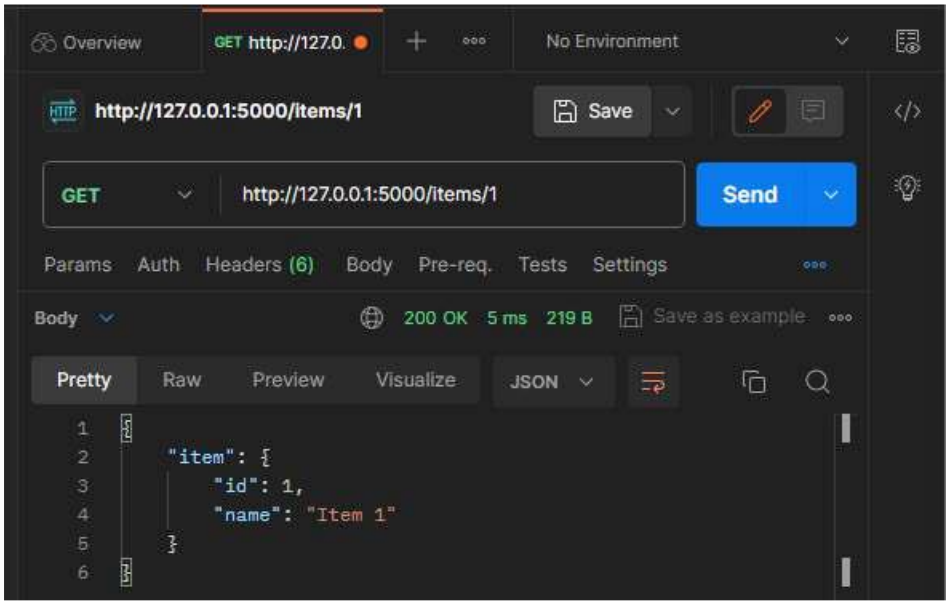
- Set the request type to **GET**.
- Enter the URL for a specific item ID, for example:

http://127.0.0.1:5000/items/1

Name:
Register Number:

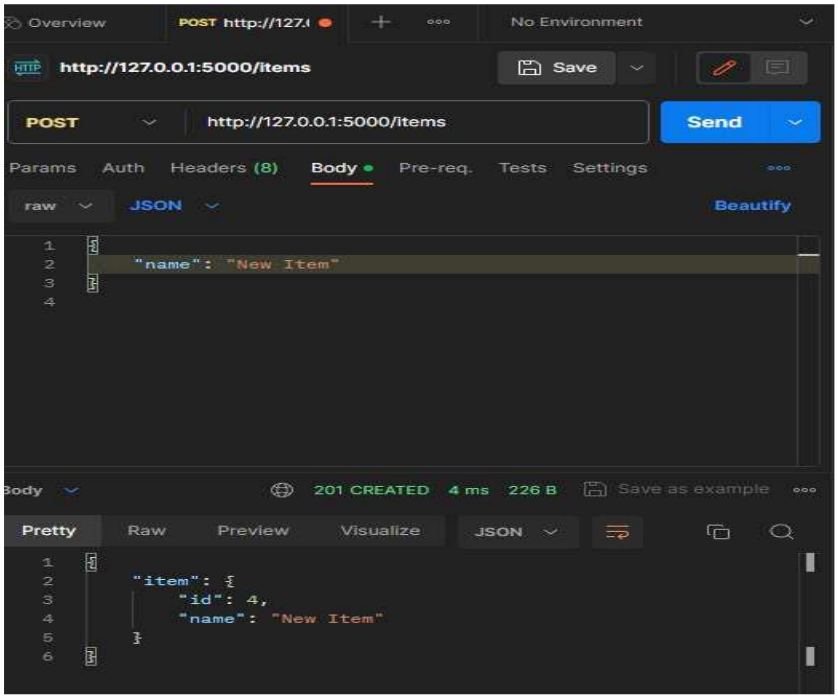
Ex. No:
Date:

- Click "Send."



3. POST Request to Add a New Item:

- Set the request type to **POST**.
- Enter the URL: **http://127.0.0.1:5000/items**
- Go to the "Body" tab, select "raw" and choose "JSON (application/
- json)".Enter the request body
- Click "Send."

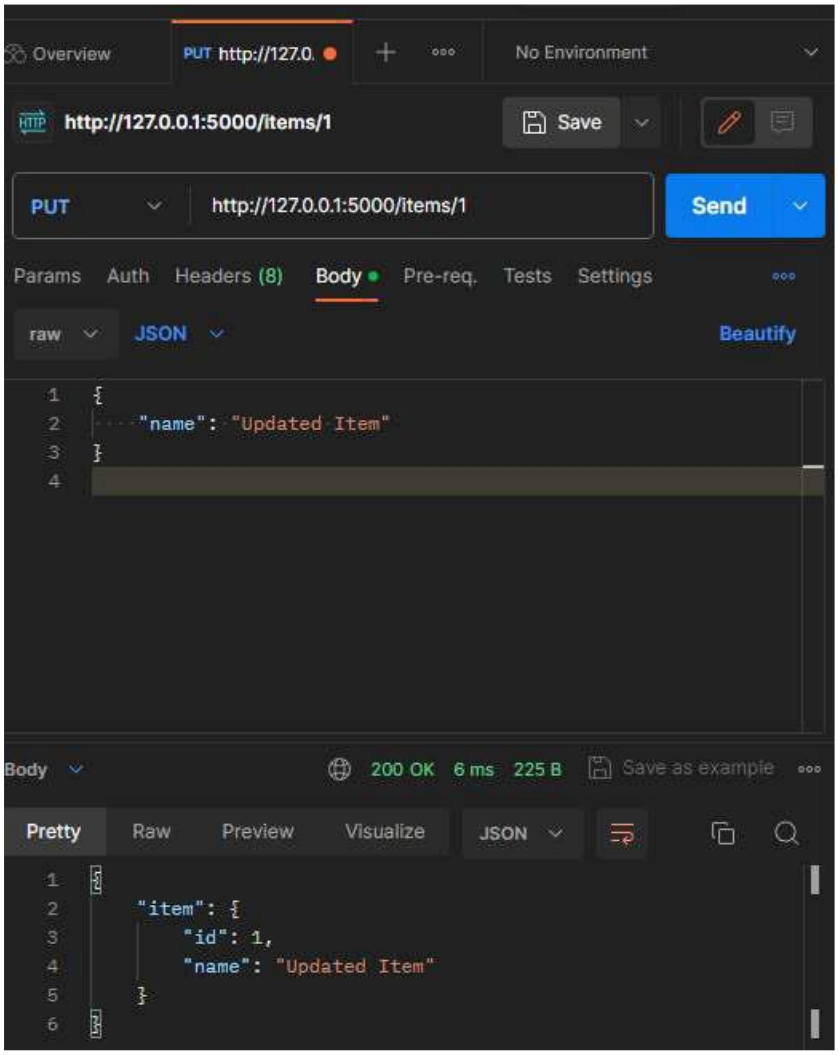


Name:
Register Number:

Ex. No:
Date:

4. PUT Request to Update an Existing Item:

- Set the request type to **PUT**.
- Enter the URL for a specific item ID, for example:
- **http://127.0.0.1:5000/items/1**
- Go to the "Body" tab, select "raw" and choose "JSON (application/
- json)".
- Enter the updated information
- Click "Send."



5. DELETE Request to Remove a Specific Item by ID:

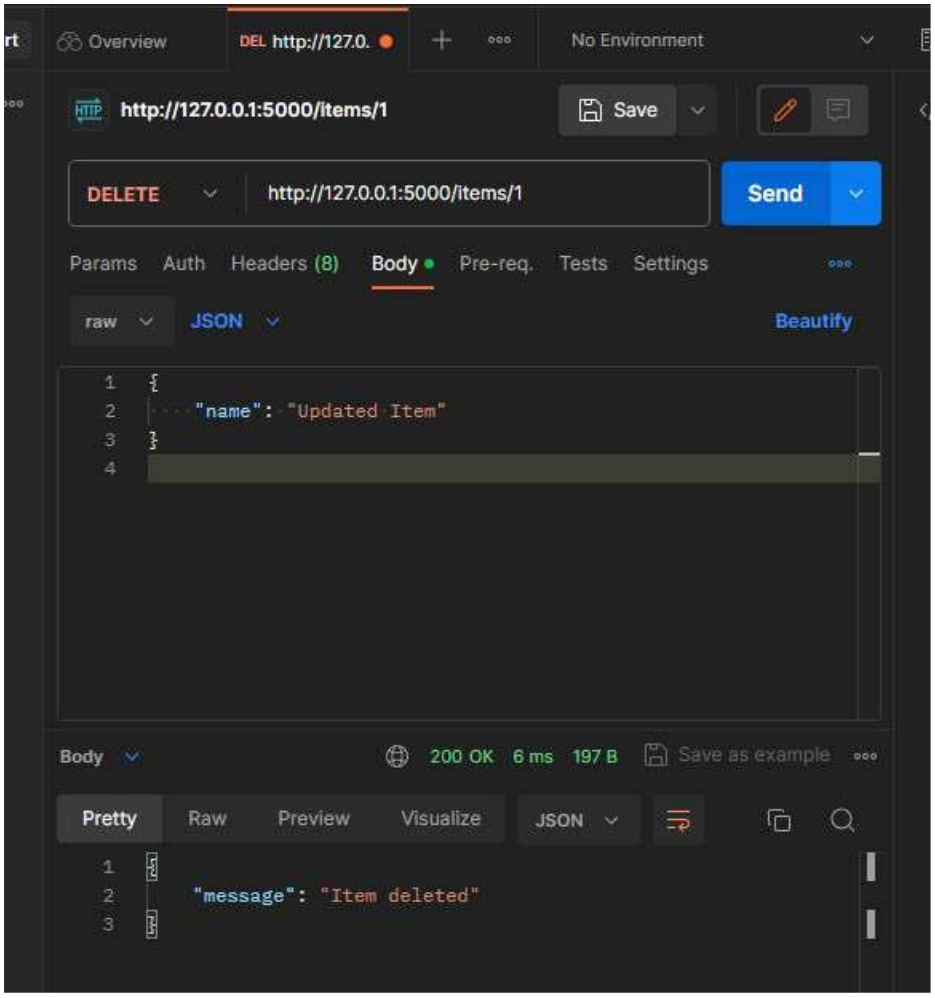
- Set the request type to **DELETE**.
- Enter the URL for a specific item ID, for example:

Name:
Register Number:

Ex. No:
Date:

http://127.0.0.1:5000/items/1

- Click "Send."



Step 4: View Server Output

```
C:\Users\NAVEEN\Desktop>python app.py
 * Serving Flask app 'app'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 598-854-429
127.0.0.1 - - [16/Nov/2023 18:40:00] "GET /items HTTP/1.1" 200 -
127.0.0.1 - - [16/Nov/2023 18:40:08] "GET /items/1 HTTP/1.1" 200 -
127.0.0.1 - - [16/Nov/2023 18:40:25] "POST /items HTTP/1.1" 201 -
127.0.0.1 - - [16/Nov/2023 18:40:38] "PUT /items/1 HTTP/1.1" 200 -
127.0.0.1 - - [16/Nov/2023 18:40:44] "DELETE /items/1 HTTP/1.1" 200 -
```

Result:

Name:
Register Number:

Ex. No:
Date:

Aim:

To Install Burp Suite to do following vulnerabilities:

- SQL Injection

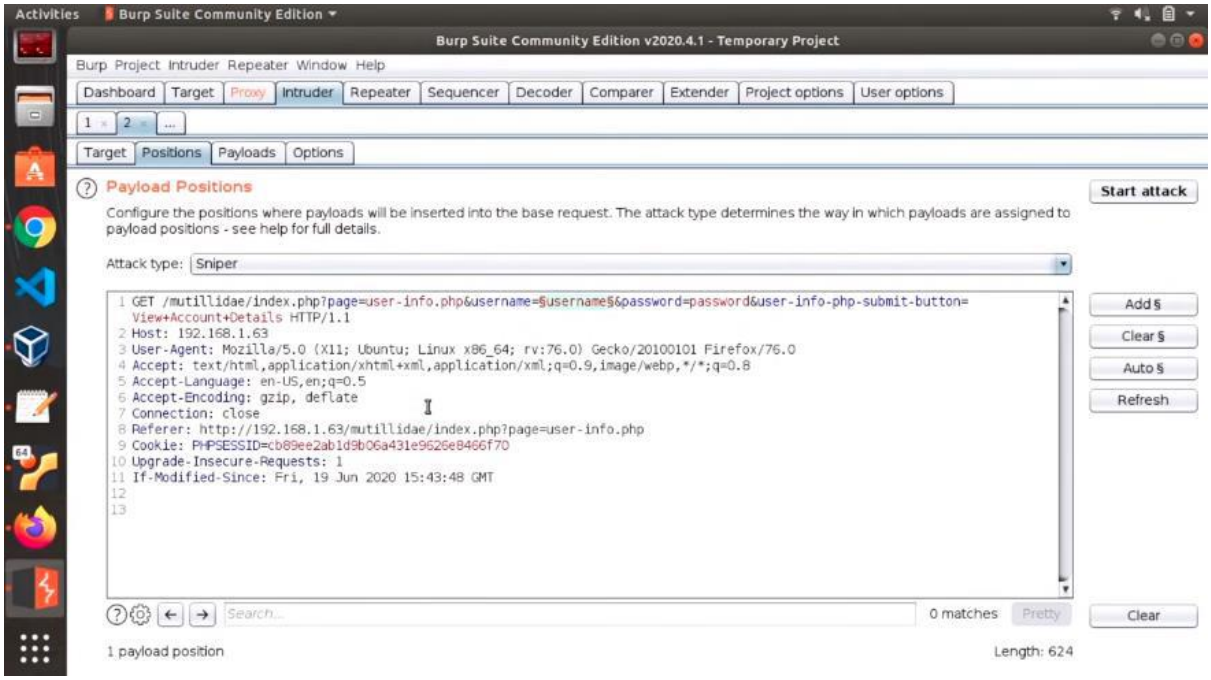
Procedure:

1. Install Burpsuite and connect the burpsuite proxy in browser proxy settings.
2. Turn on the intercept and search for the website which needs to be captured.

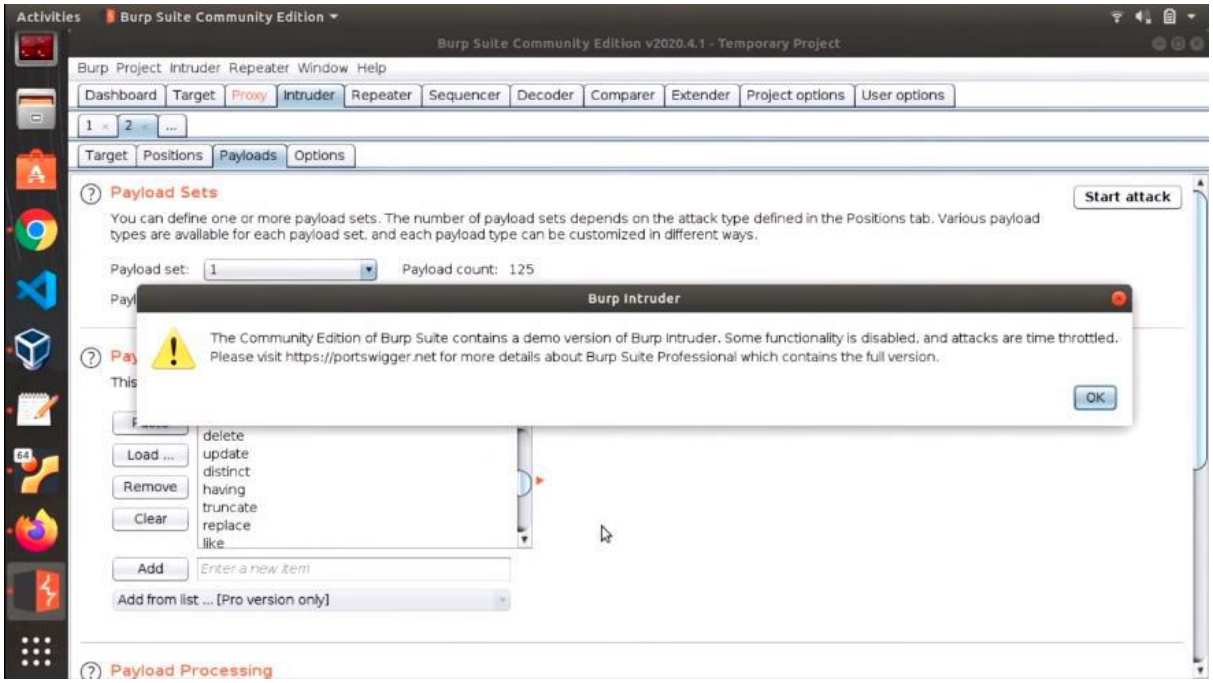
3. Send the intercepted request to the intruder and load the SQL Injection File from the device which is already installed.

Name:
Register Number:

Ex. No:
Date:



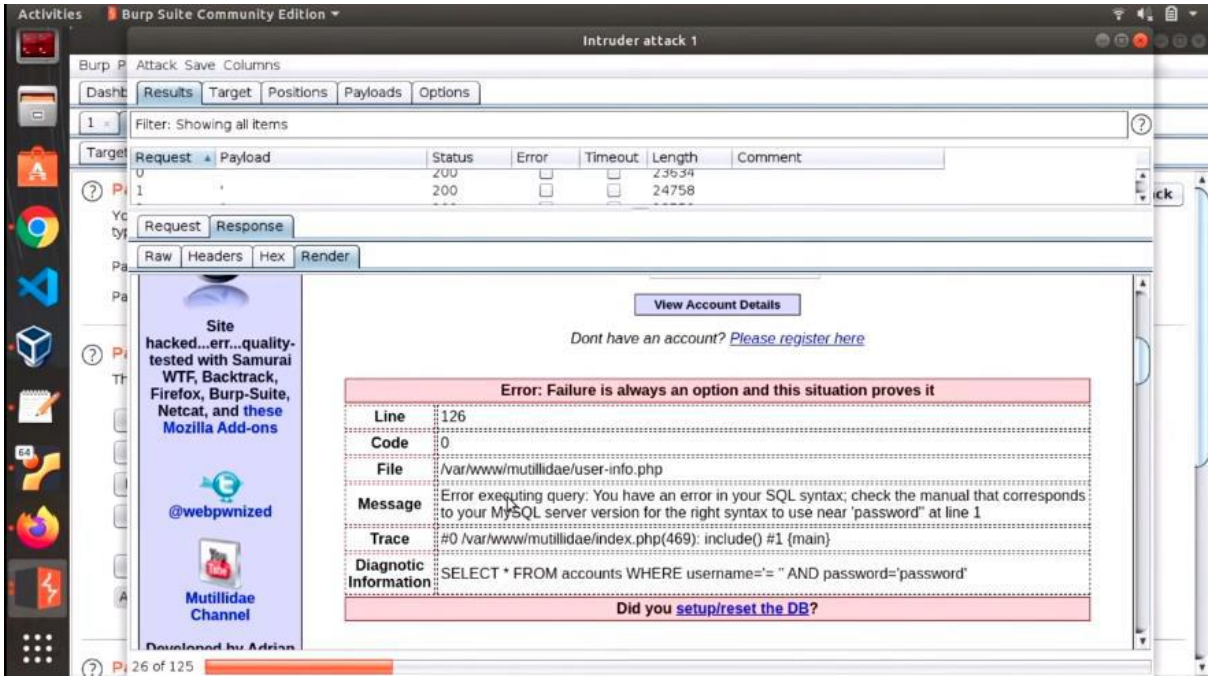
4. Start the attack in the intruder and search for the requests & responses in the render screen for SQL Injection.

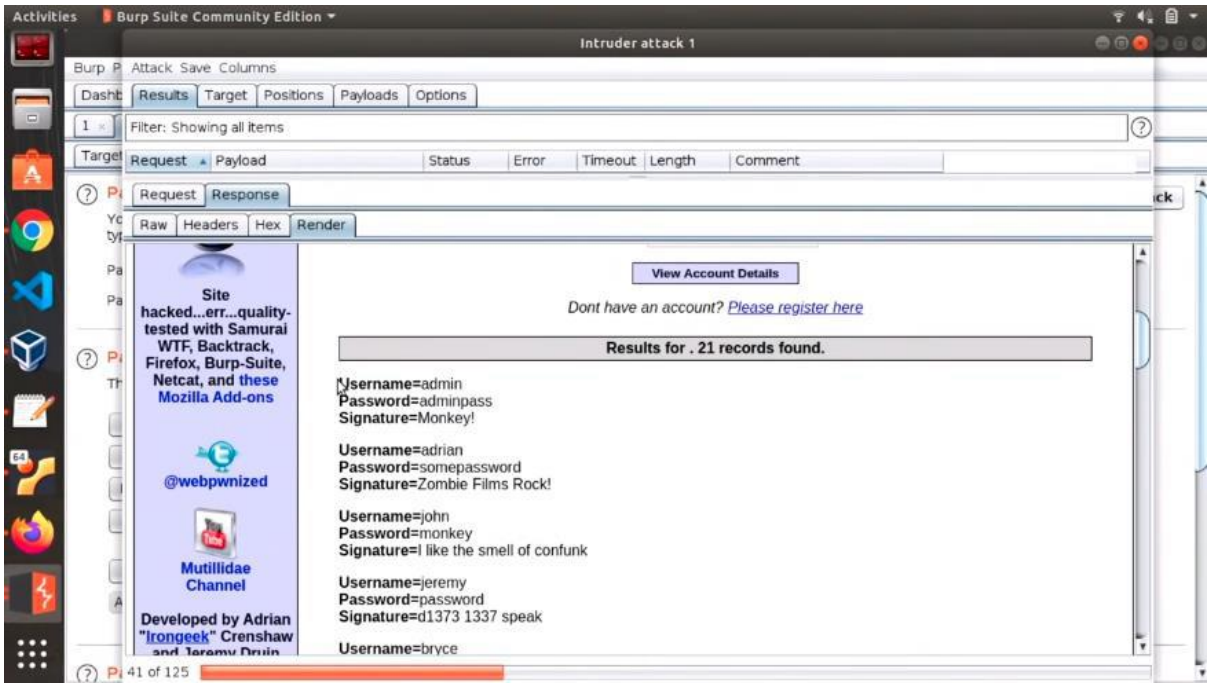


5. After the attack, some response render shows the username and password for the webpage.

Name:
Register Number:

Ex. No:
Date:





Result:

Name:
Register Number:

Ex. No:
Date:

Aim:

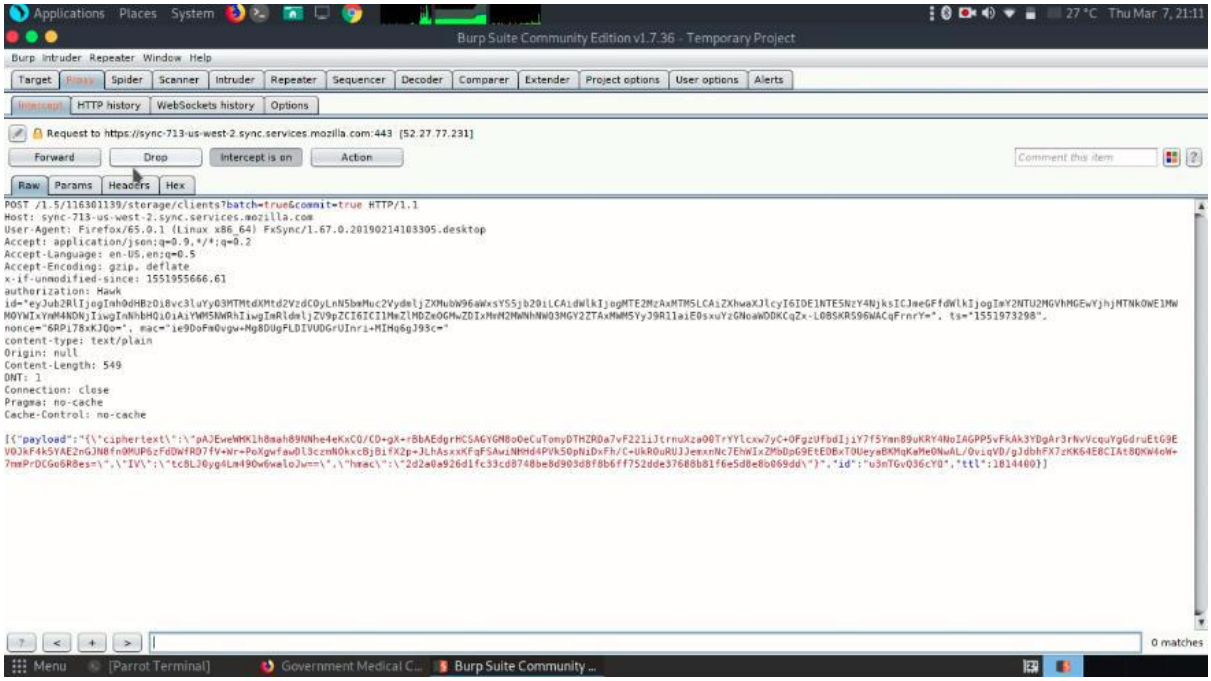
To Install Burp Suite to do following vulnerabilities:

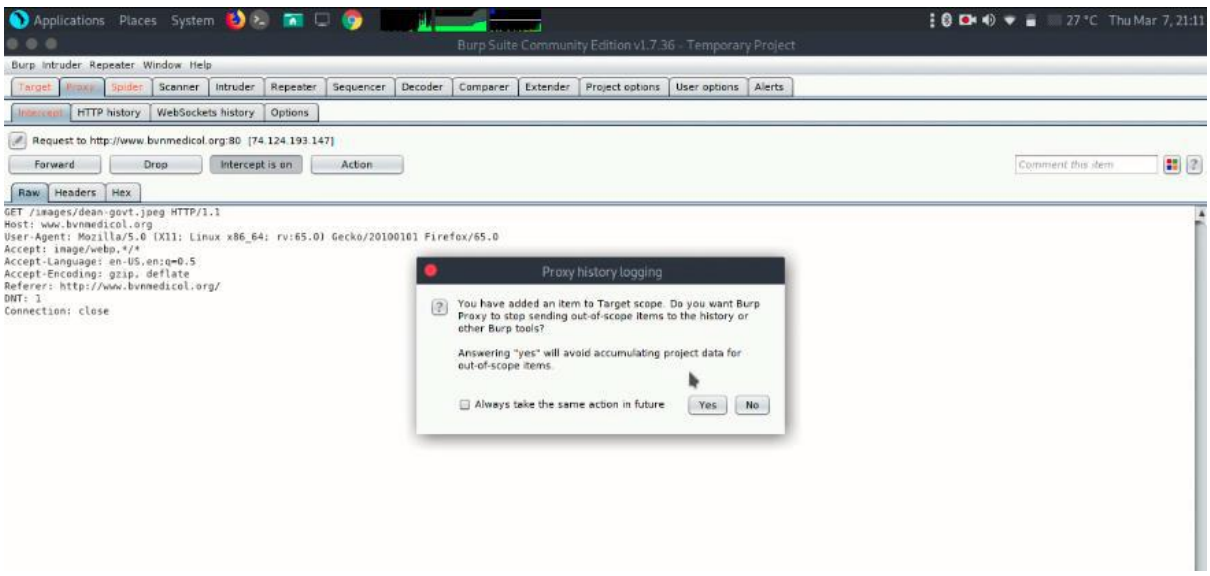
- Cross-Site Scripting (XSS)

Procedure:

1. Turn on the intercept and search for the website which needs to be captured.

2. Add the captured request to the Target scope.

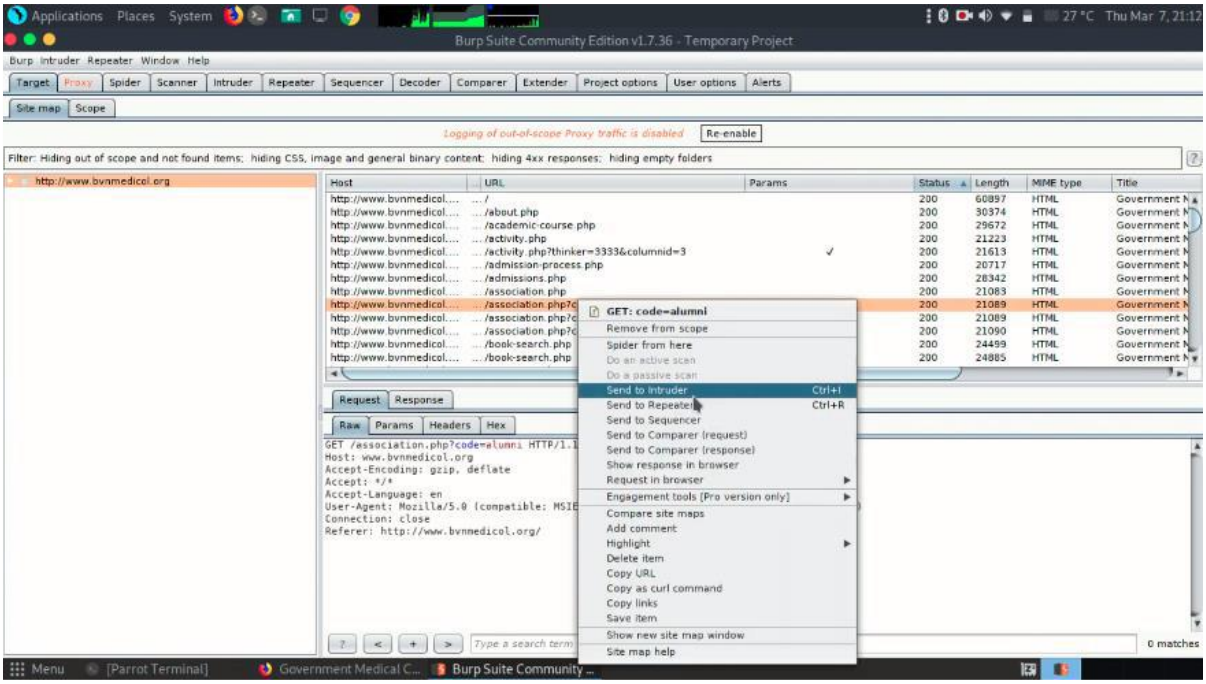




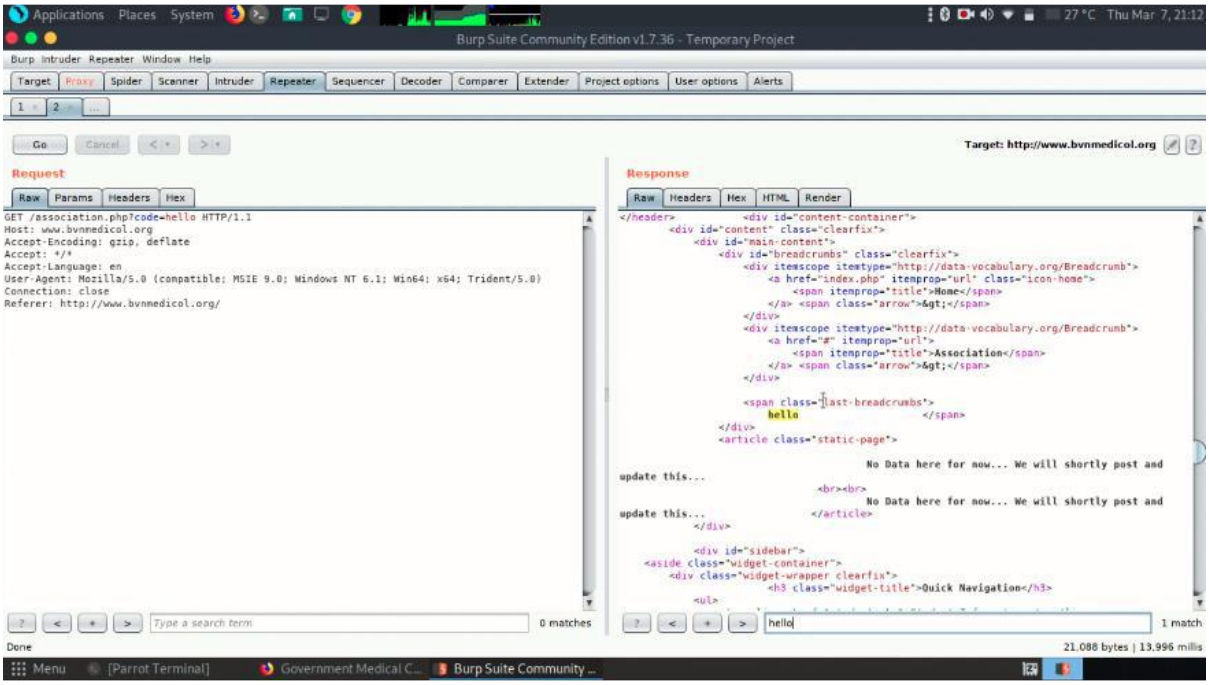
3. Go to Target section and search for the captured request in the item field and send the target item to the repeater.

Name:
Register Number:

Ex. No:
Date:

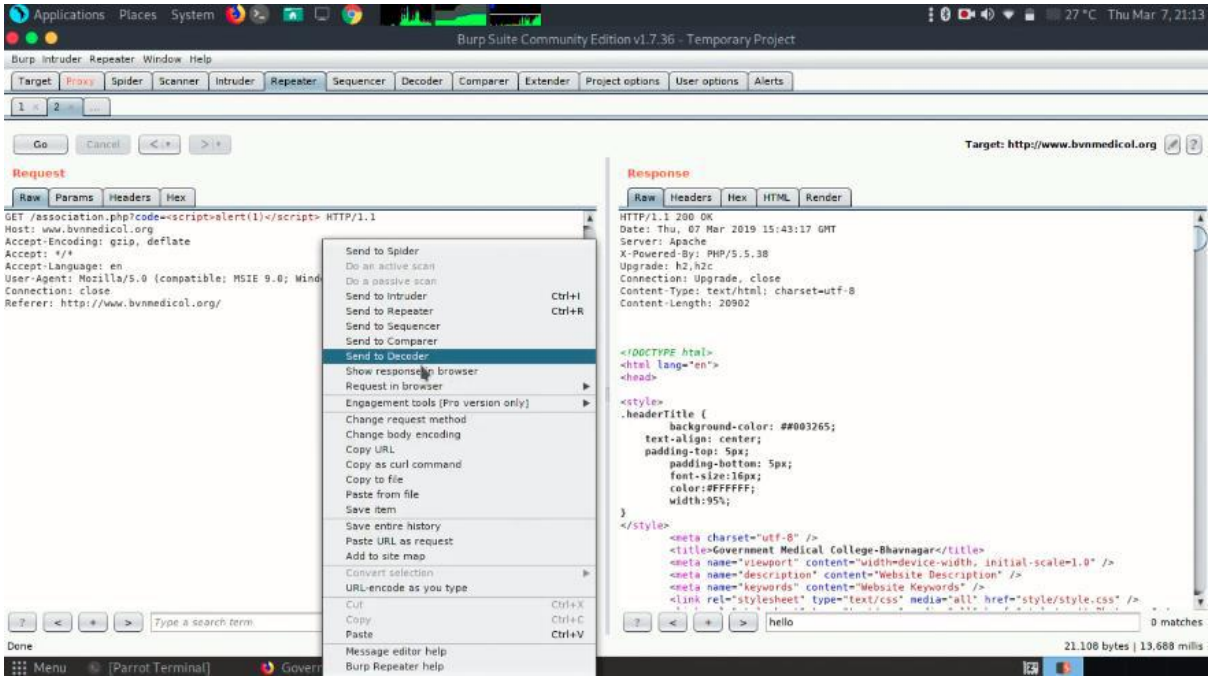


4. The request in the repeater section will be modified and send to the Decoder.

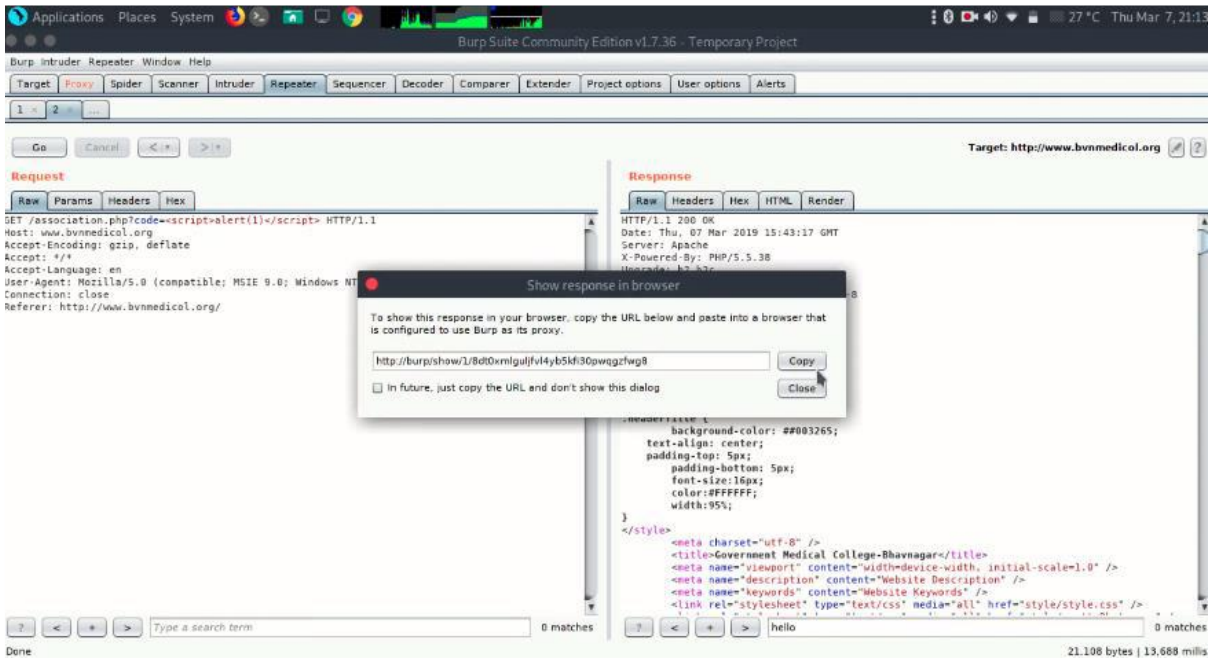


Name:
Register Number:

Ex. No:
Date:



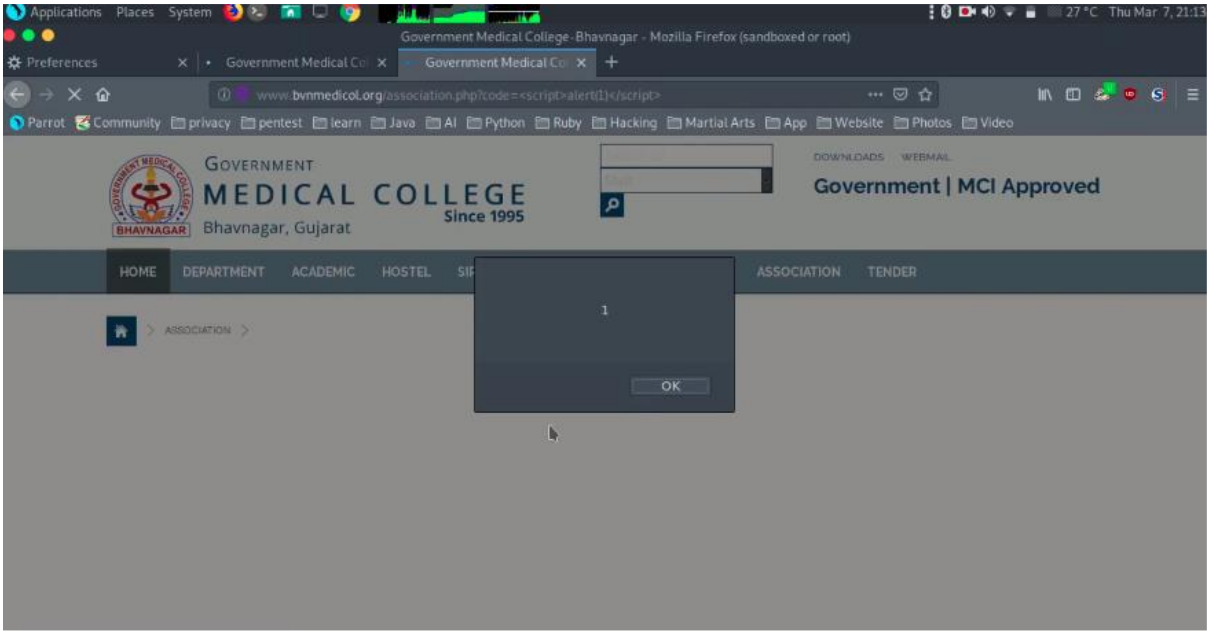
5. Before sending the response to the browser, Copy the URL below and paste into a browser that to configured to use Burp as its proxy.



6. Open the browser to see the modified response. An alert message is popup while opening the website.

Name:
Register Number:

Ex. No:
Date:



Result:

Name:
Register Number:

Ex. No:
Date:

Aim:

To attach the website using social engineering method

Procedure & Output:

Installation of Social engineering toolkit :

Step 1: Open your Kali Linux Terminal and move to Desktop

>>>cd Desktop

Step 2: As of now you are on a desktop so here you have to create a new directory named SEToolkit using the following command.

>>>mkdir SEToolkit

Step 3: Now as you are in the Desktop directory however you have created a SEToolkit directory so move to SEToolkit directory using the following command

>>>cd SEToolkit

Step 4: Now you are in SEToolkit directory here you have to clone SEToolkit from GitHub so you can use it.

>>>git clone https://github.com/trustedsec/social-engineer-toolkit setoolkit/

Step 5: Social Engineering Toolkit has been downloaded in your directory now you have to move to the internal directory of the social engineering toolkit using the following command.

>>>cd setoolkit

Step 6: Congratulations you have finally downloaded the social engineering toolkit in your directory SEToolkit. Now it's time to install requirements using the following command.

`pip3 install -r requirements.txt

Name:
Register Number:

Ex. No:
Date:

```
root@kali:~/Desktop/SEToolkit/setoolkit# pip3 install -r requirements.txt
Requirement already satisfied: pexpect in /usr/lib/python3/dist-packages (from -r requir
ements.txt (line 1)) (4.6.0)
Requirement already satisfied: pycrypto in /usr/lib/python3/dist-packages (from -r requi
rements.txt (line 2)) (2.6.1)
Requirement already satisfied: requests in /usr/lib/python3/dist-packages (from -r requi
rements.txt (line 3)) (2.22.0)
Requirement already satisfied: pyopenssl in /usr/lib/python3/dist-packages (from -r requ
irements.txt (line 4)) (19.0.0)
Requirement already satisfied: pefile in /usr/lib/python3/dist-packages (from -r require
ments.txt (line 5)) (2019.4.18)
Requirement already satisfied: impacket in /usr/lib/python3/dist-packages (from -r requi
rements.txt (line 6)) (0.9.20)
Requirement already satisfied: qrcode in /usr/lib/python3/dist-packages (from -r require
ments.txt (line 8)) (6.1)
Requirement already satisfied: pillow in /usr/lib/python3/dist-packages (from -r require
ments.txt (line 9)) (6.2.1)
Requirement already satisfied: pymssql<3.0 in /usr/lib/python3/dist-packages (from -r re
quirements.txt (line 11)) (2.1.4)
Requirement already satisfied: ldapdomaindump≥0.9.0 in /usr/lib/python3/dist-packages (
from impacket->-r requirements.txt (line 6)) (0.9.1)
```

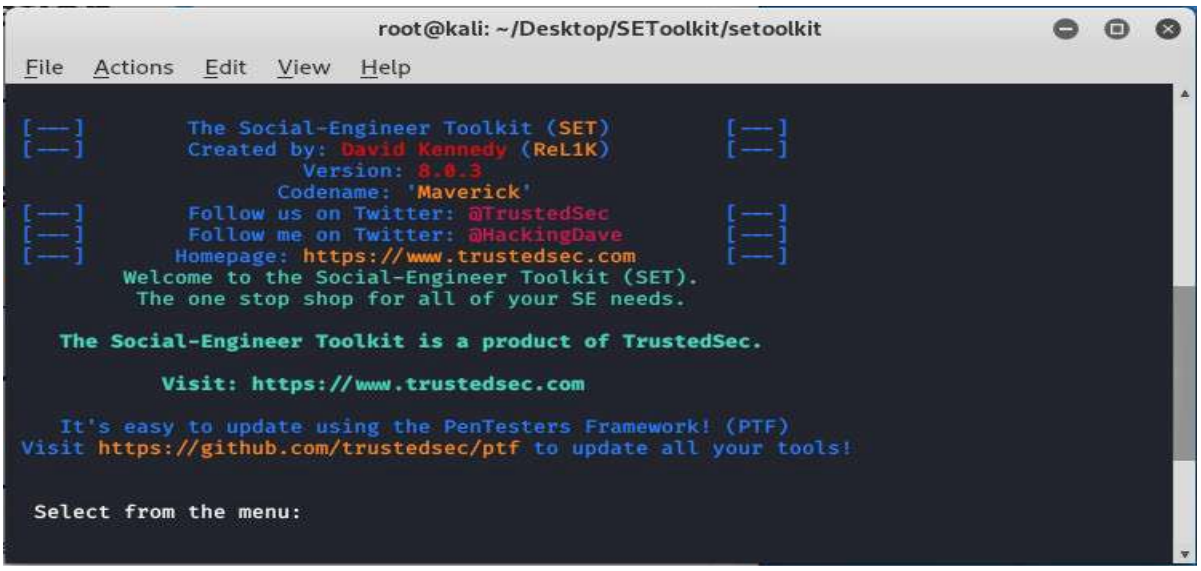
Step 7: All the requirements have been downloaded in your setoolkit. Now it's time to install the requirements that you have downloaded

>>>python setup.py

Step 8: Finally all the processes of installation have been completed now it's time to run the social engineering toolkit .to run the SEToolkit type following command.

>>>Setoolkit

Step 9: At this step, setoolkit will ask you (y) or (n). Type y and your social engineering toolkit will start running.



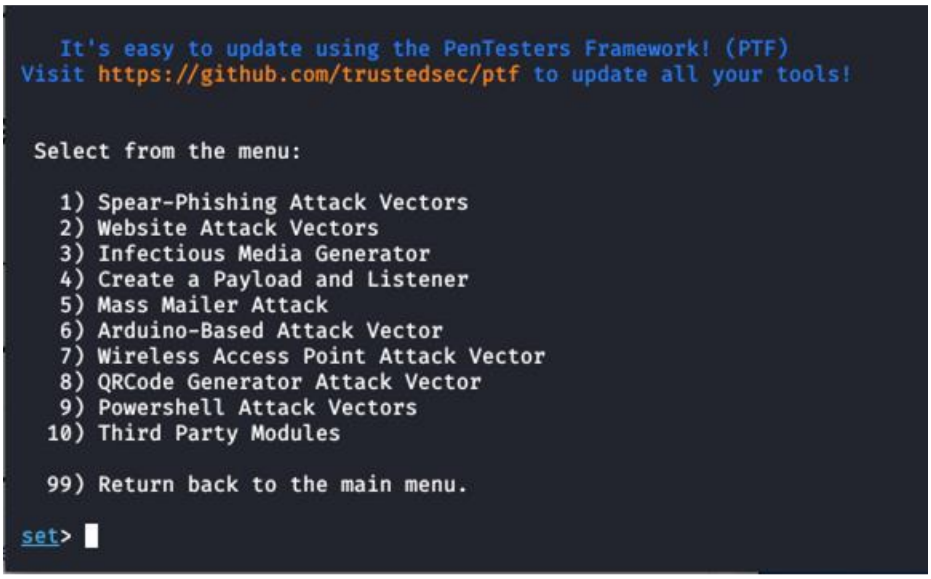
Name:
Register Number:

Ex. No:
Date:

Step 10: Now your setoolkit has been downloaded into your system now it's time to use it .now you have to choose an option from the following options .here we are choosing option 2

Website Attack Vector

Option: 2



Step 11: Now we are about to set up a phishing page so here we will choose option 3 that is the credential harvester attack method.

Option: 3

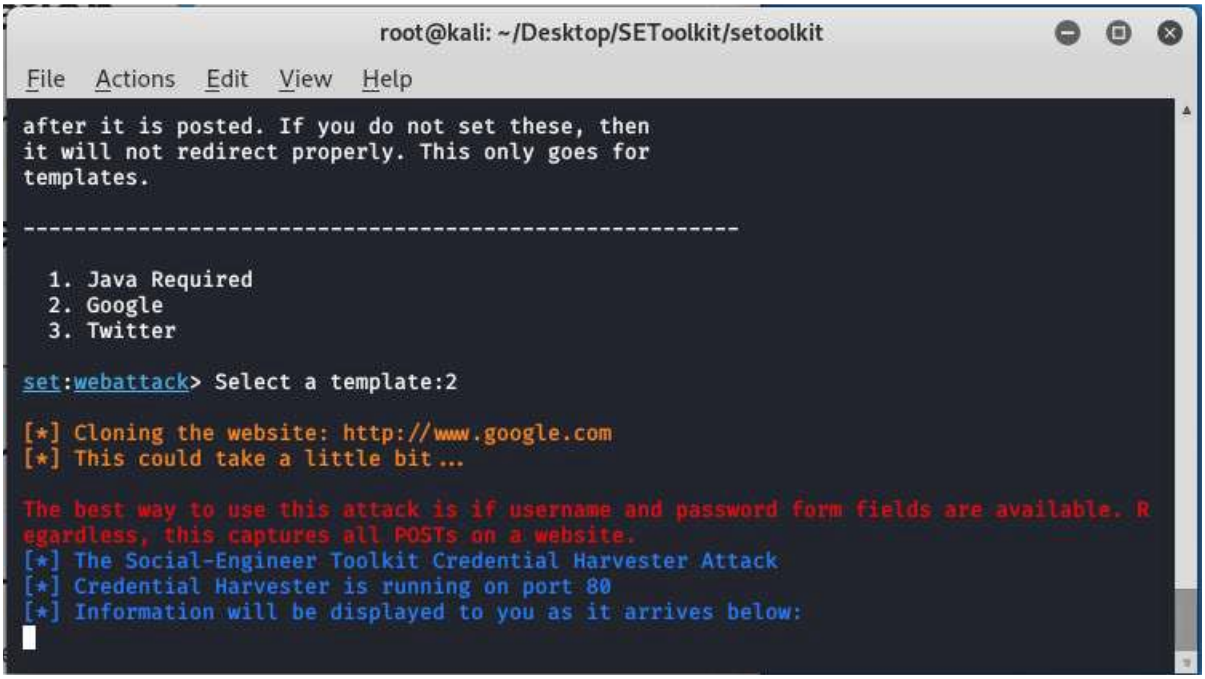
Step 12: Now since we are creating a Phishing page so here we will choose option 1 that is web templates.

Option: 1

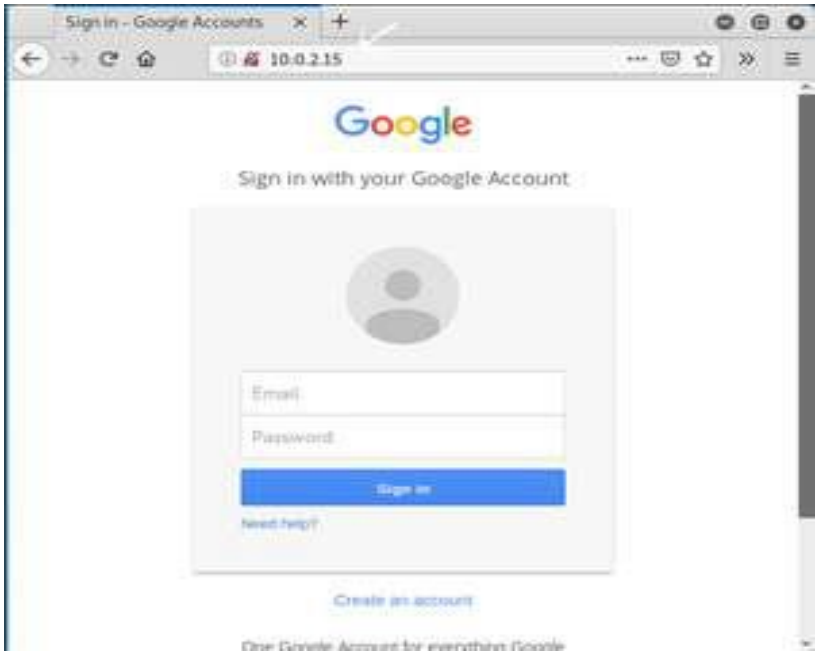
Name:
Register Number:

Ex. No:
Date:

Step 13: Create a google phishing page so choose option 2 for that then a phishing page will be generated on your localhost.



Step 14: Social engineering toolkit is creating a phishing page of google.



RESULT:

Name:
Register Number:

Ex. No:
Date:

AIM: To download the N-Stalker Vulnerability Assessment Tool and exploring the features.

Procedure:

- **EXPLORING N-STALKER:** N-Stalker Web Application Security Scanner is a Web security assessment tool.
- It incorporates with a well-known N-Stealth HTTP Security Scanner and 35,000 Web attack signature database.
- This tool also comes in both free and paid version.
- Before scanning the target, go to "License Manager" tab, perform the update.
- Once update, you will note the status as up to date.

You need to download and install N-Stalker from www.nstalker.com.

1. Start N-Stalker from a Windows computer. The program is installed under Start ➪ Programs ➪ N-Stalker ➪ N-Stalker Free Edition.

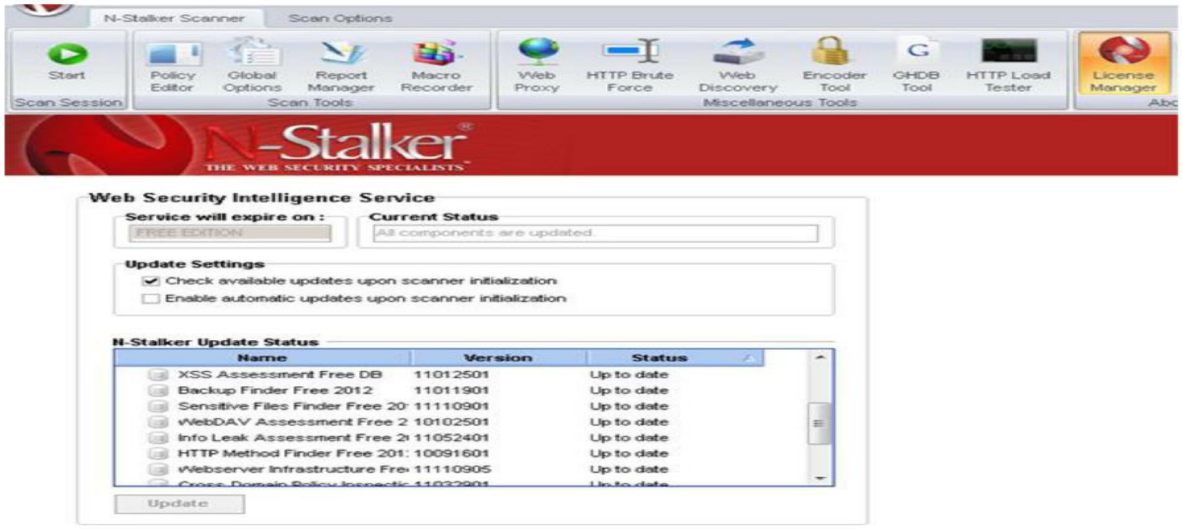
2. Enter a host address or a range of addresses to scan.

3. Click Start Scan.

4. After the scan completes, the N-Stalker Report Manager will prompt

5. you to select a format for the resulting report as choose Generate HTML.

6. Review the HTML report for vulnerabilities.



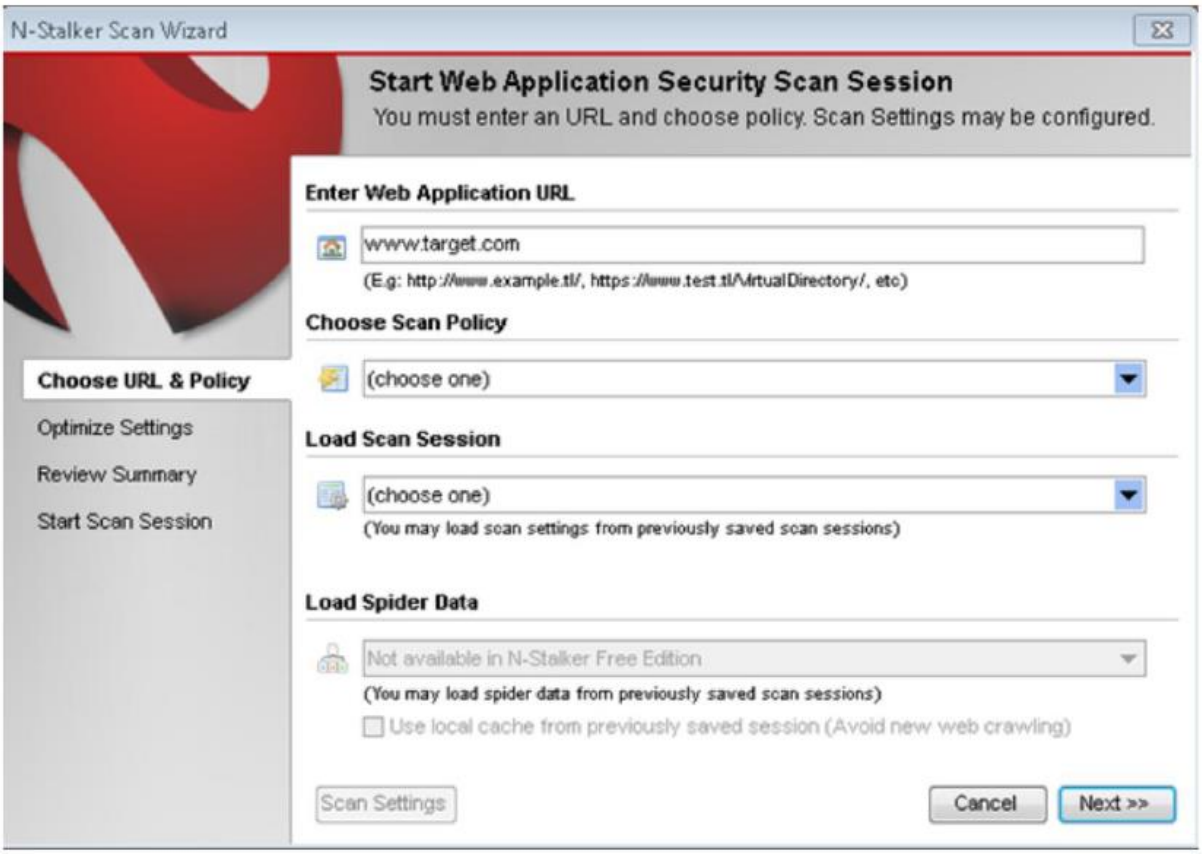
Name:
Register Number:

Ex. No:
Date:

- Now goto “Scan Session”, enter the target URL. In scan policy, you can select from the four options,

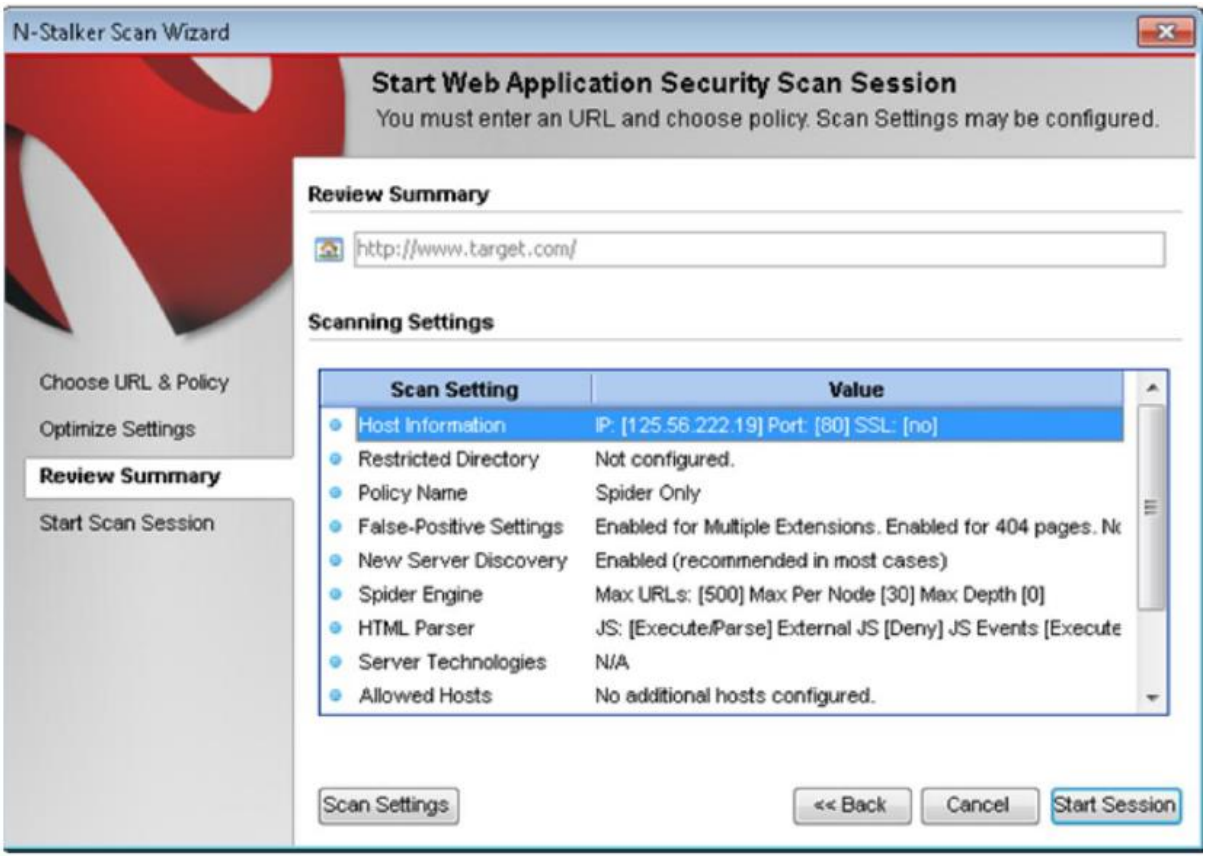
1. Manual test which will crawl the website and will be waiting for manual attacks.
2. full xss assessment
3. owasp policy
4. Web server infrastructure analysis.

- Once, the option has been selected, next step is “Optimize settings” which will crawl the whole website for further analysis. In review option, you can get all the information like host information, technologies used, policy name, etc.

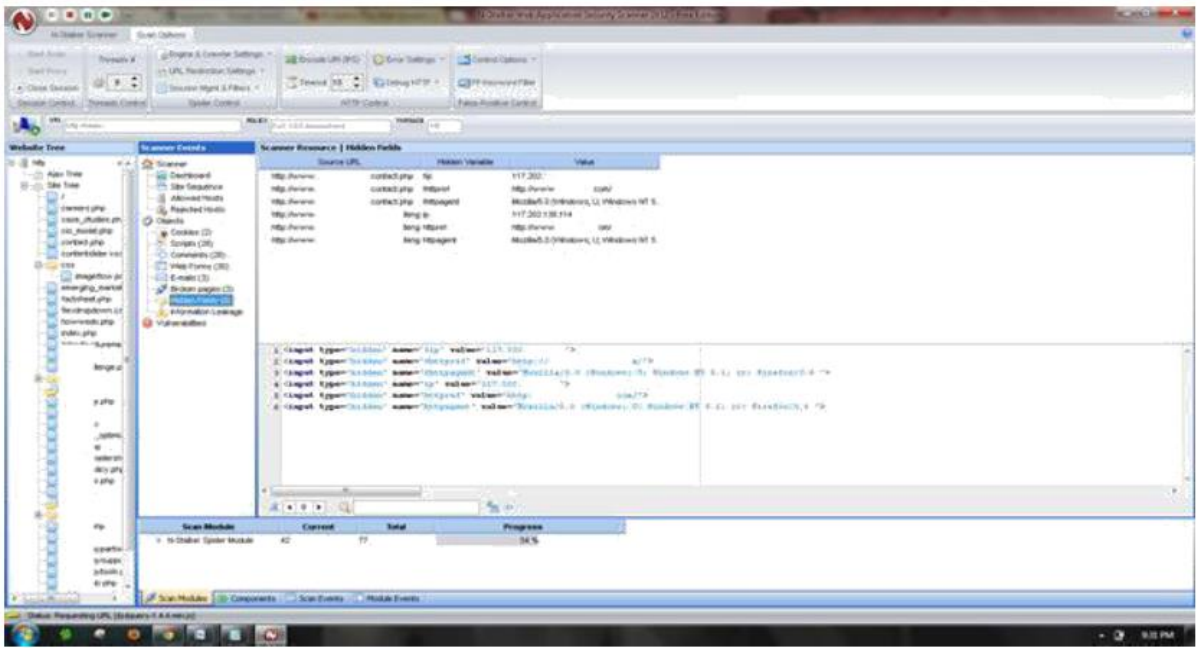


Name:
Register Number:

Ex. No:
Date:



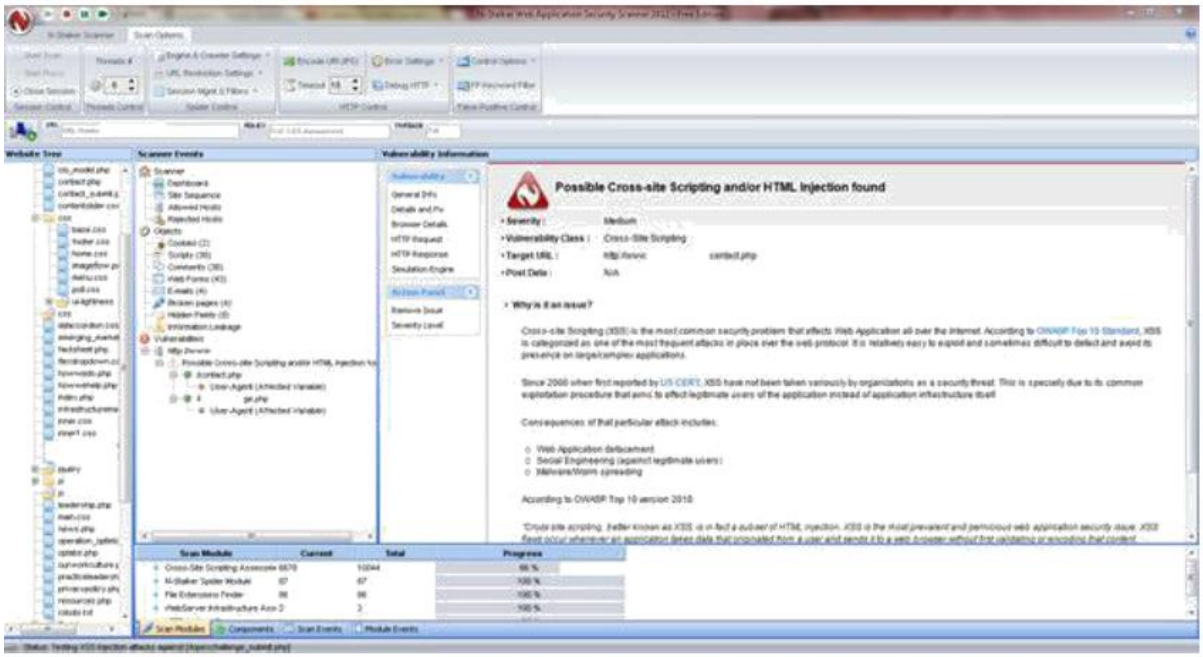
- The scanner will crawl the whole website and will show the scripts, broken pages, hidden fields, information leakage, web forms related information which helps to analyze further.



Name:
Register Number:

Ex. No:
Date:

- Once the scan is completed, the NStalker scanner will show details like severity level, vulnerability class, why is it an issue, the fix for the issue and the URL which is vulnerable to the particular vulnerability?



RESULT:

Name:
Register Number:

Ex. No:
Date:

AIM: Creating your First Vulnerability Scan: Nexpose Starter

Procedure:

Nexpose: Nexpose, created by Rapid7, is a powerful tool for analyzing vulnerabilities. It stands out for its ability to identify and handle security weaknesses, prioritize risks, and provide detailed reports. Nexpose helps organizations maintain strong security by being scalable, user-friendly, and capable of integration. This makes it valuable for both small and large businesses to effectively address and reducing security risks.

Key Features of Nexpose

- **Extensive Vulnerability Coverage:** Nexpose boasts a vast database of vulnerabilities, encompassing operating systems, applications, network devices, and more. It leverages industry-standard feeds and threat intelligence to stay current with emerging threats.
- **Prioritization and Risk Scoring:** Nexpose helps you prioritize remediation efforts by assigning risk scores to identified vulnerabilities. These scores consider exploitability, potential impact, and asset criticality, guiding you toward the most pressing issues.
- **Compliance Reporting:** Nexpose generates reports aligned with various compliance frameworks, such as PCI DSS, HIPAA, and GDPR, simplifying regulatory adherence.
- **Automation and Scheduling:** Nexpose can be automated to run regular scans, ensuring continuous vulnerability assessment and reducing manual intervention.
- **Integrations:** Nexpose integrates with numerous security tools and frameworks, including Metasploit and Tenable.io, streamlining your workflows.

Ex. No:
Date:

- **Intuitive Interface:** Nexpose presents a user-friendly interface, making it accessible to users with varying levels of technical expertise.

Nexpose Vulnerability Analysis Tools: Step-by-step Installation Process & Implementation of nexpose vulnerability analysis tools.

Step 1: Setting Permissions Using chmod

To make a file work, you need to do a few things in Linux. Use a command called chmod to change the file's permissions to make it executable. Just type in "chmod +x" and then the file name, which in this case is Rapid7Setup-Linux64.bin.

chmod +x Rapid7Setup-Linux64.bin

Step 2: Installation Steps

Follow these steps:

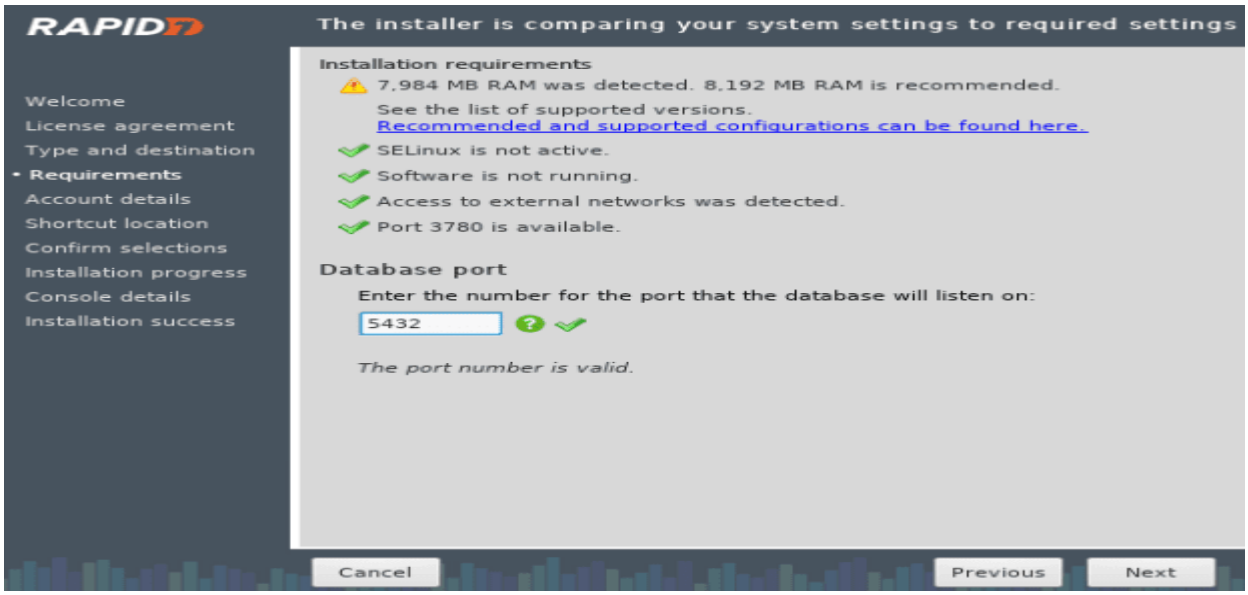
- Click on "Next" as shown in the picture above.
- It will then ask you to agree to the terms. Click "Accept" and then click "Next."
- This will allow you to continue with the installation process.

Name:
Register Number:

Ex. No:
Date:

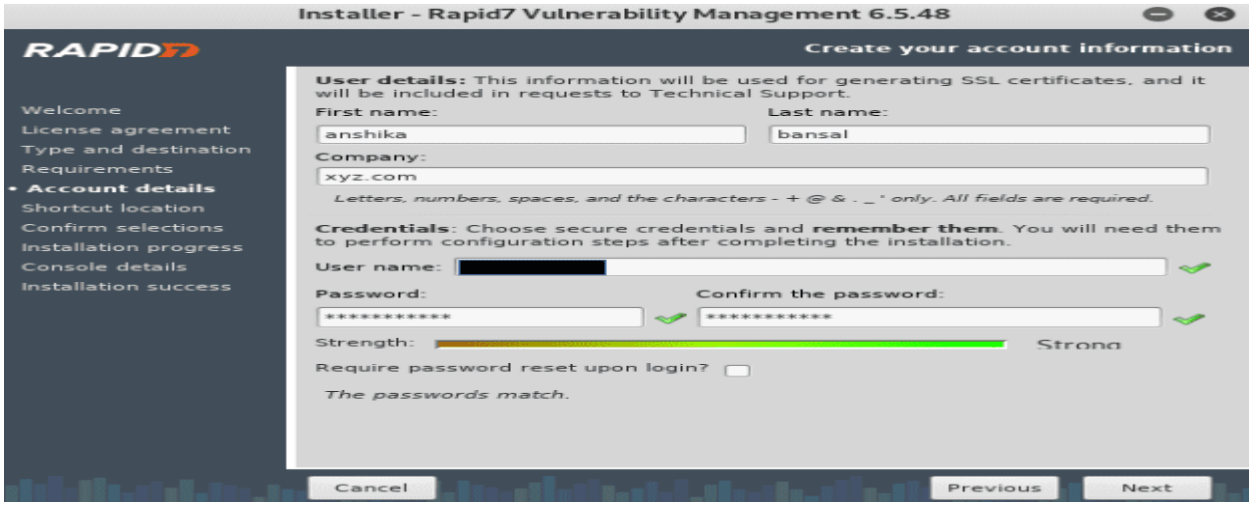
Step 3: Configuring Database Port (Default (5432))

- The setup will prompt you to specify the port for the database that Nexpose will utilize.
- The default port is set to 5432. If you do not need to modify it, proceed by clicking on “Next.”



Step 4: User Information Setup

- Fill in the required information, including First Name, Last Name, Company, User Name, and Password.
- Once all necessary information is provided, click on “Next” to proceed with the installation.

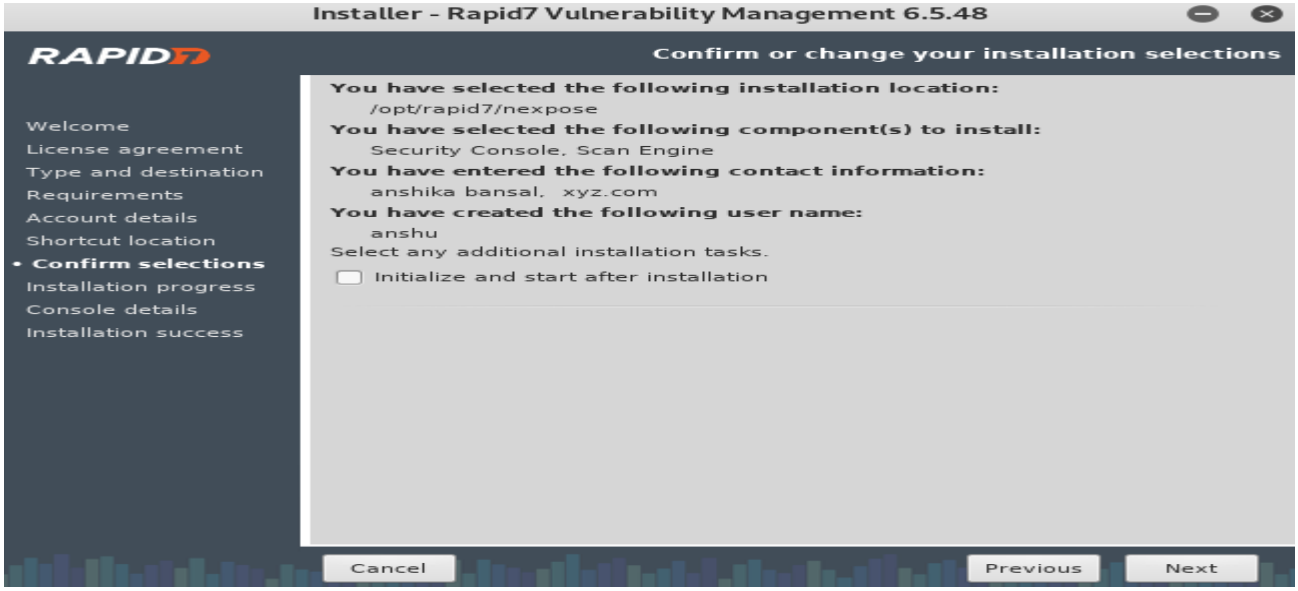


Name:
Register Number:

Ex. No:
Date:

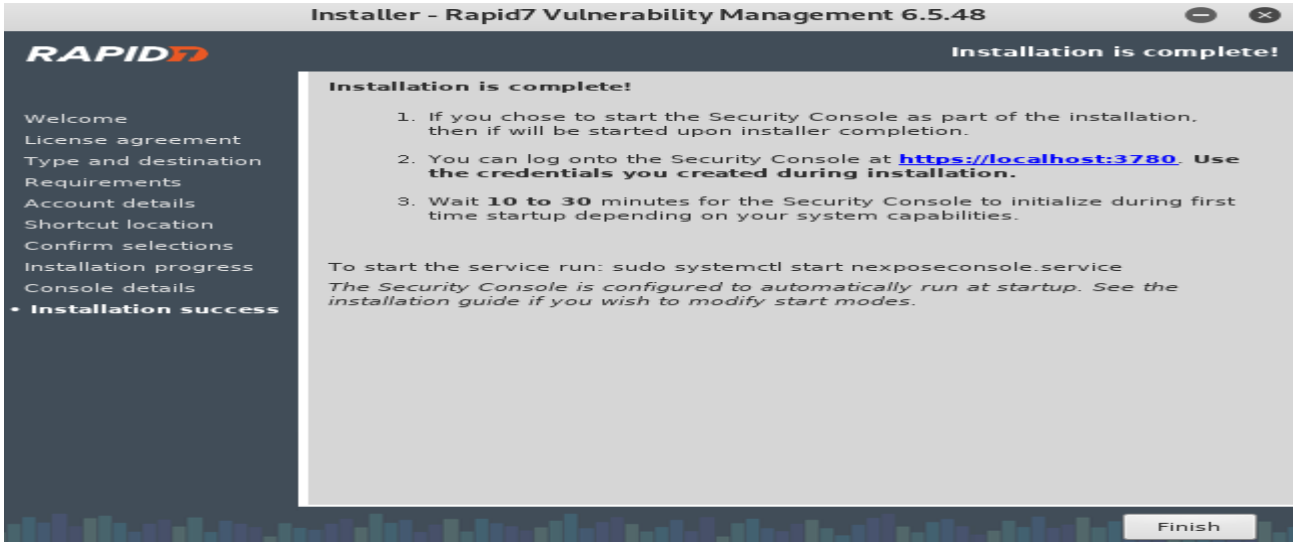
Step 5: Unchecking Installation Box to Avoid Issues

- A checkbox may be presented, usually labeled as “Start Nexpose immediately after installation.”
- Important: Do not check this box, as it may lead to potential issues during installation.
- Leave the box unchecked and proceed with the installation



Step 6: Complete Installation

- Once the installation process is complete, a confirmation message will be displayed.Click on “Finish” to finalize the installation process.



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- The uses of nexpose vulnerability analysis tools, those are following.
  1. **Vulnerability Identification**- Nexpose uses automated scans to find and list vulnerabilities in a company's IT setup. This includes weaknesses in systems, networks, and applications.

VULNERABILITIES

Apply Filters (0 applied)

Title	CVSS	Risk	Published On	Modified On	Severity	Instances	Exceptions
Default Tomcat User and Password	10	899	Mon Nov 09 2009	Fri Jun 03 2016	Critical	1	Exclude
USN-758-1: udev vulnerabilities	7.2	867	Fri Apr 17 2009	Tue Jul 04 2017	Severe	1	Exclude
USN-1423-1: Samba vulnerability	10	849	Tue Apr 10 2012	Tue Jul 04 2017	Critical	1	Exclude
USN-897-1: MySQL vulnerabilities	8.5	844	Mon Jul 13 2009	Tue Jul 04 2017	Critical	1	Exclude
USN-1397-1: MySQL vulnerabilities	8.5	844	Mon Jul 13 2009	Tue Jul 04 2017	Critical	1	Exclude
CVE-2014-6271 bash: specially-crafted environment variables can be used to inject shell commands	10	830	Wed Sep 24 2014	Wed Mar 21 2018	Critical	1	Exclude
CVE-2014-6278 bash: code execution via specially crafted environment variables	10	830	Tue Sep 30 2014	Tue Sep 30 2014	Critical	1	Exclude
'rsh' Remote Shell Service Enabled	7.5	758	Fri Jan 01 1999	Wed Dec 04 2013	Critical	1	Exclude
'rlogin' Remote Login Service Enabled	7.5	758	Fri Jan 01 1999	Wed Dec 04 2013	Critical	1	Exclude
USN-951-1: Samba vulnerability	7.5	732	Thu Jun 17 2010	Tue Jul 04 2017	Critical	1	Exclude

Showing 1 to 10 of 306 | Export to CSV Rows per page: 10 1 of 31

  2. **Risk Prioritization-** The solution assigns risk rankings to detected vulnerabilities, allowing security teams to prioritize repair actions based on their severity and possible impact.

Top 25 Remediations by Risk with Details
Top Remediations with Details
April 26, 2018 15:38:32

Applying 25 Top Remediations

Will Remediate 71% Vulnerabilities including: 36% published exploits, 20% available malware kits

Affecting 9 Assets

Remediations	Remediated Vulns			Affected Assets	Risk
Upgrade to the latest version of PHP	168	13	0	2	67688
Upgrade to the latest version of Mozilla Firefox	97	0	0	1	44016
Upgrade to the latest version of Mozilla Firefox ESR	60	0	0	1	27665
Upgrade to the latest version of Oracle MySQL	54	3	0	1	11791
Upgrade to the latest version of Google Chrome	21	0	0	1	9423
Upgrade to the latest version of Apache HTTPD	31	3	0	2	7568
Upgrade to the latest version of PostgreSQL	21	0	0	1	5698
Upgrade to Samba 3.0.33	9	8	0	1	5454
Enable authorization for linux single user mode	6	0	0	6	5176

  3. **Reporting and Remediation-** The program creates extensive vulnerability reports, which provide insights into the environment's

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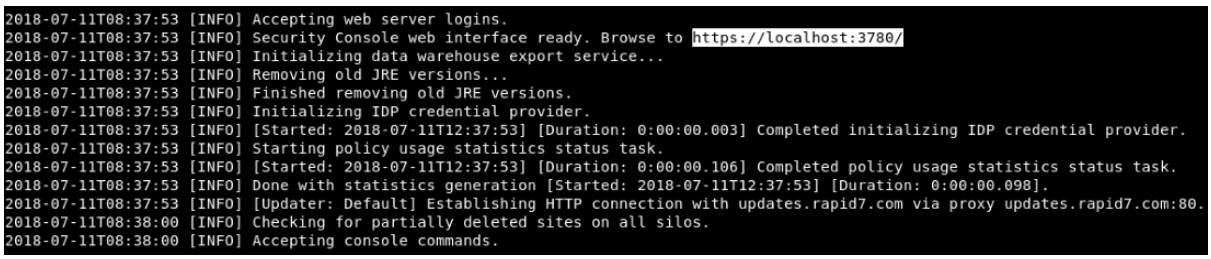
security posture. These reports are critical for making decisions and communicating with stakeholders. Nexpose also makes recommendations on appropriate remediation procedures.

Example:

Vulnerability Scanner Nexpose: To run any executable, type./ followed by the filename nsc. sh. It may take some time to run this command for the first time. The utility has successfully loaded, as shown in the screenshot below. It tells us that we can get there by using the URL https://localhost:3780:



Result:

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Aim:

To install the ZAP tool and identify the Vulnerabilities.

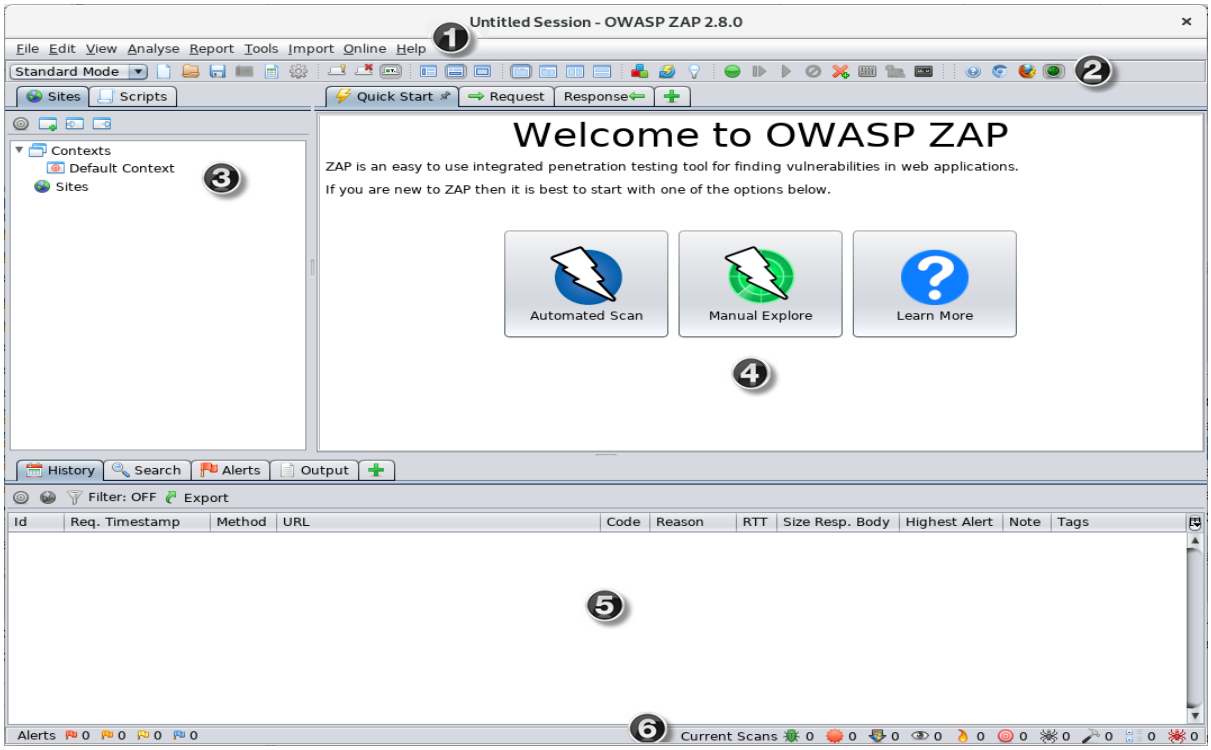
ZAP

Zed Attack Proxy (ZAP) is a free, open-source penetration testing tool being maintained under the umbrella of The Software Security Project (SSP). ZAP is designed specifically for testing web applications and is both flexible and extensible.

ZAP Desktop UI

The ZAP Desktop UI is composed of the following elements:

1. **Menu Bar** – Provides access to many of the automated and manual tools.
2. **Toolbar** – Includes buttons which provide easy access to most commonly used features.
3. **Tree Window** – Displays the Sites tree and the Scripts tree.
4. **Workspace Window** – Displays requests, responses, and scripts and allows you to edit them.
5. **Information Window** – Displays details of the automated and manual tools.
6. **Footer** – Displays a summary of the alerts found and the status of the main automated tools.



IMPORTANT:

- You should only use ZAP to attack an application you have permission to test with an active attack. Because this is a simulation that acts like a real attack, actual damage can

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be done to a site's functionality, data, etc. If you are worried about using ZAP, you can prevent it from causing harm (though ZAP's functionality will be significantly reduced) by switching to safe mode.

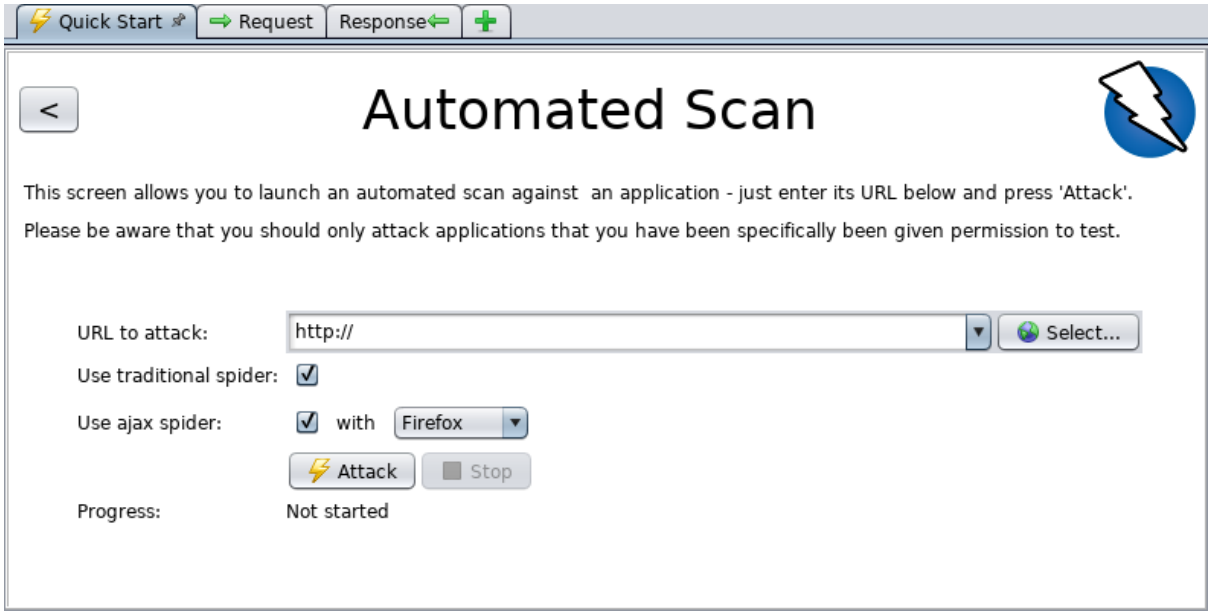
- To switch ZAP to safe mode, click the arrow on the mode dropdown on the main toolbar to expand the dropdown list and select **Safe Mode**.

Running an Automated Scan

The easiest way to start using ZAP is via the Quick Start tab. Quick Start is a ZAP add-on that is included automatically when you installed ZAP.

To run a Quick Start Automated Scan:

1. Start ZAP and click the **Quick Start** tab of the Workspace Window.
2. Click the large Automated Scan button.
3. In the **URL to attack** text box, enter the full URL of the web application you want to attack.
4. Click the **Attack**



- ZAP will proceed to crawl the web application with its spider and passively scan each page it finds. Then ZAP will use the active scanner to attack all of the discovered pages, functionality, and parameters.
- ZAP provides 2 spiders for crawling web applications, you can use either or both of them from this screen.
- ZAP will passively scan all of the requests and responses proxied through it. So far ZAP has only carried out passive scans of your web application. Passive scanning does not change responses in any way and is considered safe. Scanning is also performed in a background thread to not slow down exploration. Passive scanning is good at finding some vulnerabilities and as a way to get a feel for the basic security state of a web application and locate where more investigation may be warranted.
- Active scanning, however, attempts to find other vulnerabilities by using known attacks against the selected targets. Active scanning is a real attack on those targets and can put

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the targets at risk, so do not use active scanning against targets you do not have permission to test.

Interpret Your Test Results

As ZAP spiders your web application, it constructs a map of your web applications' pages and the resources used to render those pages. Then it records the requests and responses sent to each page and creates alerts if there is something potentially wrong with a request or response.

See Explored Pages

To examine a tree view of the explored pages, click the **Sites** tab in the Tree Window. You can expand the nodes to see the individual URLs accessed.

View Alerts and Alert Details

The left-hand side of the Footer contains a count of the Alerts found during your test, broken out into risk categories. These risk categories are:

To view the alerts created during your test:

1. Click the **Alerts** tab in the Information Window.
2. Click each alert displayed in that window to display the URL and the vulnerability detected in the right side of the Information Window.
3. In the Workspace Windows, click the **Response** tab to see the contents of the header and body of the response. The part of the response that generated the alert will be highlighted.

Exploring an Application Manually

The passive scanning and automated attack functionality is a great way to begin a vulnerability assessment of your web application but it has some limitations. Among these are:

- Any pages protected by a login page are not discoverable during a passive scan because, unless you've configured ZAP's authentication functionality, ZAP will not handle the required authentication.
- You don't have a lot of control over the sequence of exploration in a passive scan or the types of attacks carried out in an automated attack. ZAP does provide many additional options for exploration and attacks outside of passive scanning.

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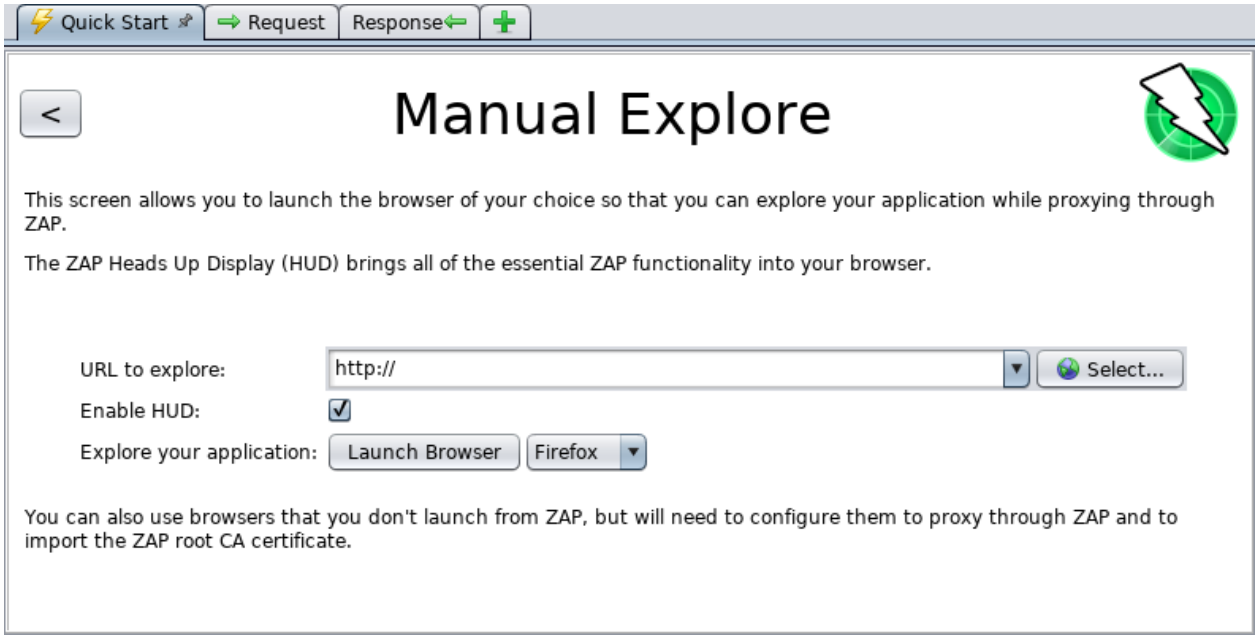
Date:

To Manually Explore your application:

1. Start ZAP and click the **Quick Start** tab of the Workspace Window.
2. Click the large Manual Explore button.
3. In the **URL to explore** text box, enter the full URL of the web application you want to explore.
4. Select the browser you would like to use
5. Click the **Launch Browser**



- This option will launch any of the most common browsers that you have installed with new profiles.
- If you would like to use any of your browsers with an existing profile, for example with other browser add-ons installed, then you will need to manually configure your browser to proxy via ZAP and import and trust the ZAP Root CA Certificate. See the ZAP Desktop User Guide for more details.
- By default, the ZAP Heads Up Display (HUD) will be enabled. Unchecking the relevant option on this screen before launching a browser will disable the HUD.

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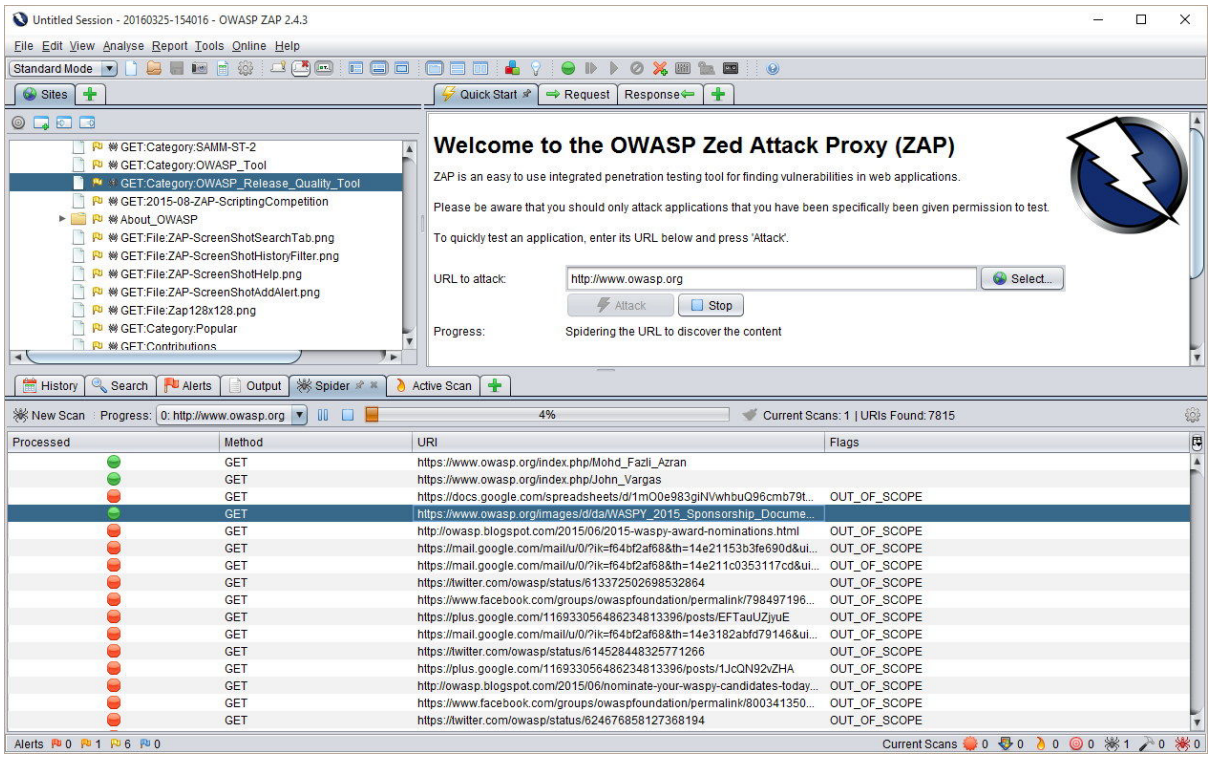
Output:



Result:

Name:
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