

OWASP ZAP

OWASP ZAP: The Zed Attack Proxy (ZAP) is an easy to use integrated penetration testing tool for finding vulnerabilities in web applications. It is designed to be used by people with a wide range of security experience including developers and functional testers who are new to penetration testing.

OWASP (Open Web Application Security Project)

OWASP (Open Web Application Security Project) is an organization that provides unbiased and practical, cost-effective information about computer and Internet applications.

ZAP (Zed Attack Proxy)

The Zed Attack Proxy (ZAP) is an easy to use integrated penetration testing tool for finding vulnerabilities in web applications. ... OWASP Zed Attack Proxy Web Site

WebGoat

WebGoat is a free online tool used to test and uncover application flaws that might otherwise go unnoticed. Issues with SQL injection and cross-site scripting (XSS) often fly under the security radar and issues are often discovered too late.

Installation and configuration of ZAP:

Download Link:

<https://github.com/zaproxy/zaproxy/wiki/Downloads>

Step1

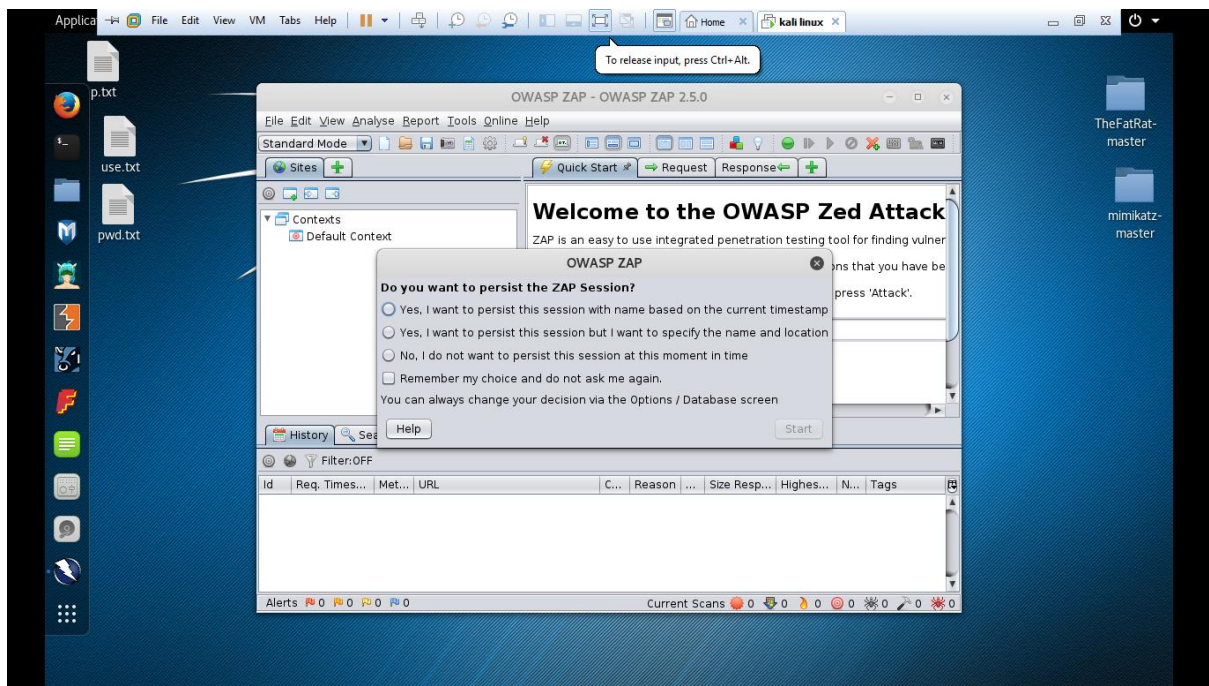
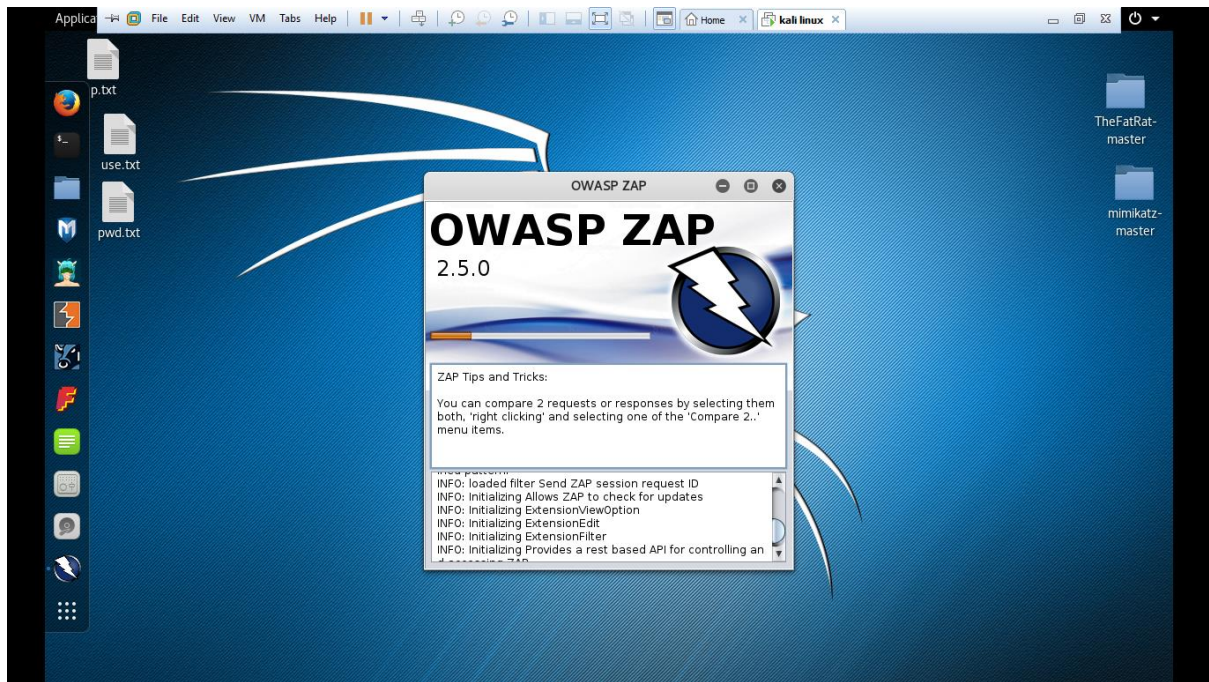
Adding a site to the testing scope

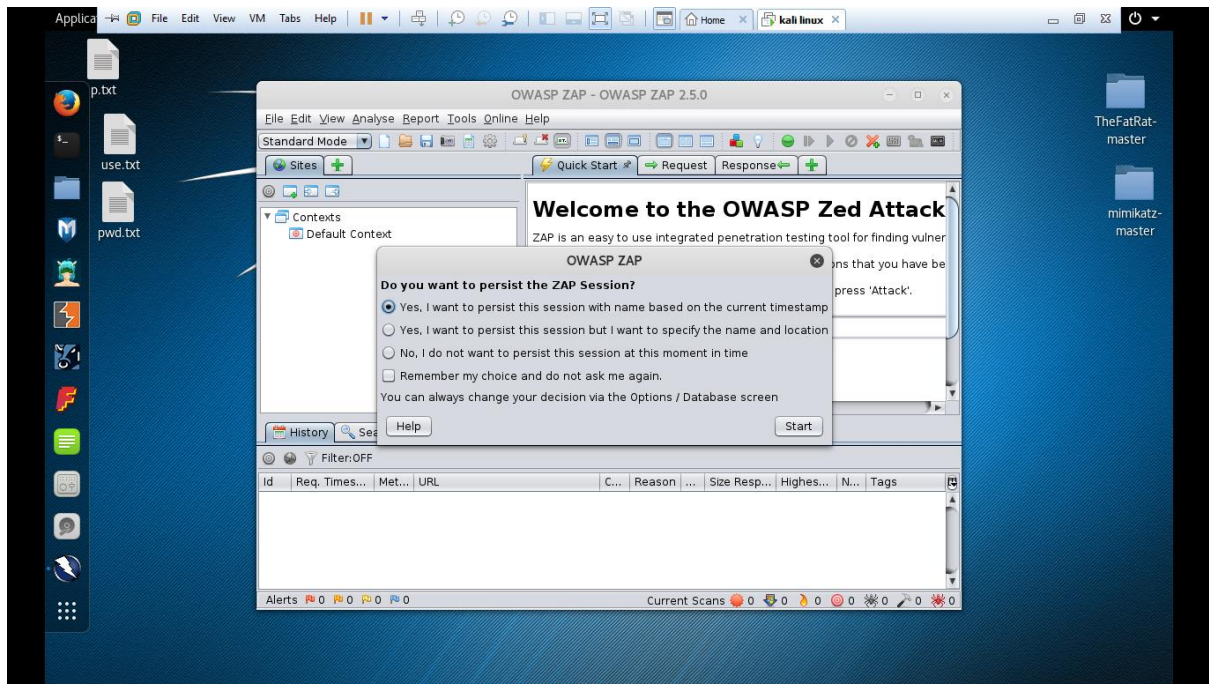
By telling ZAP what the target site is, ZAP can limit the scope of the scan and only scan the target site for vulnerabilities.

1. Open the web application that you want to test.

2. In Zap you will find your website/application displayed under sites.

ZAP will spider that URL, then perform an active scan and display the results.





Zap runs on proxy, to set up the proxy in ZAP:

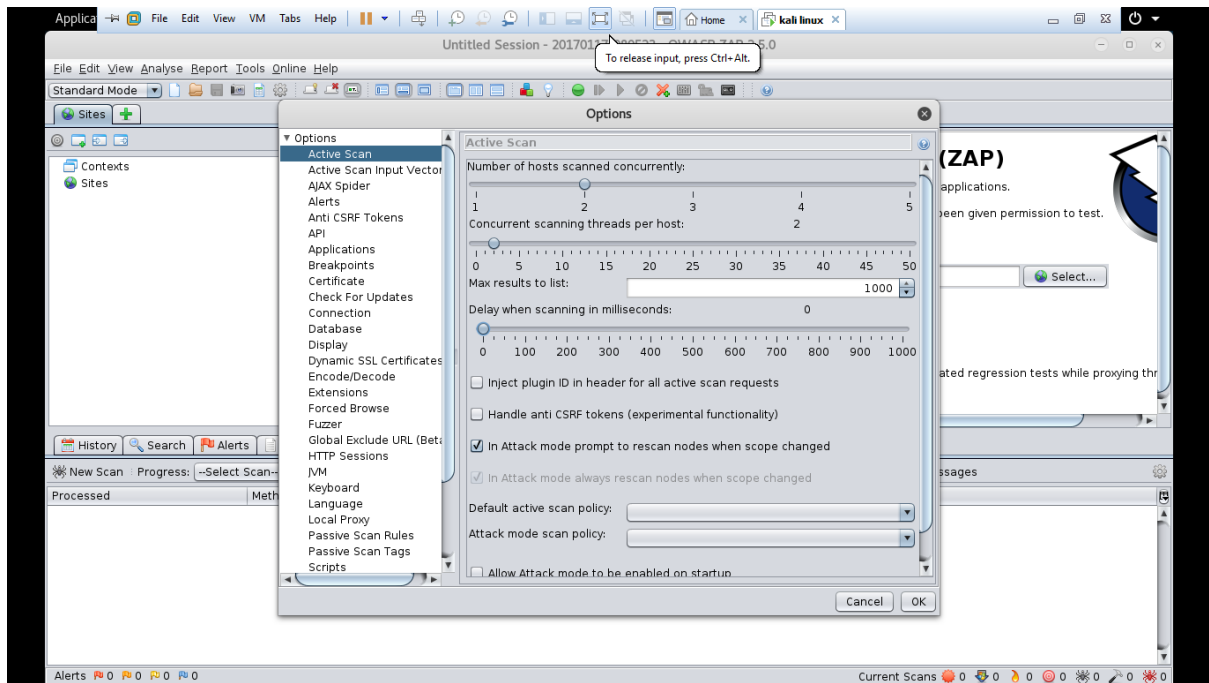
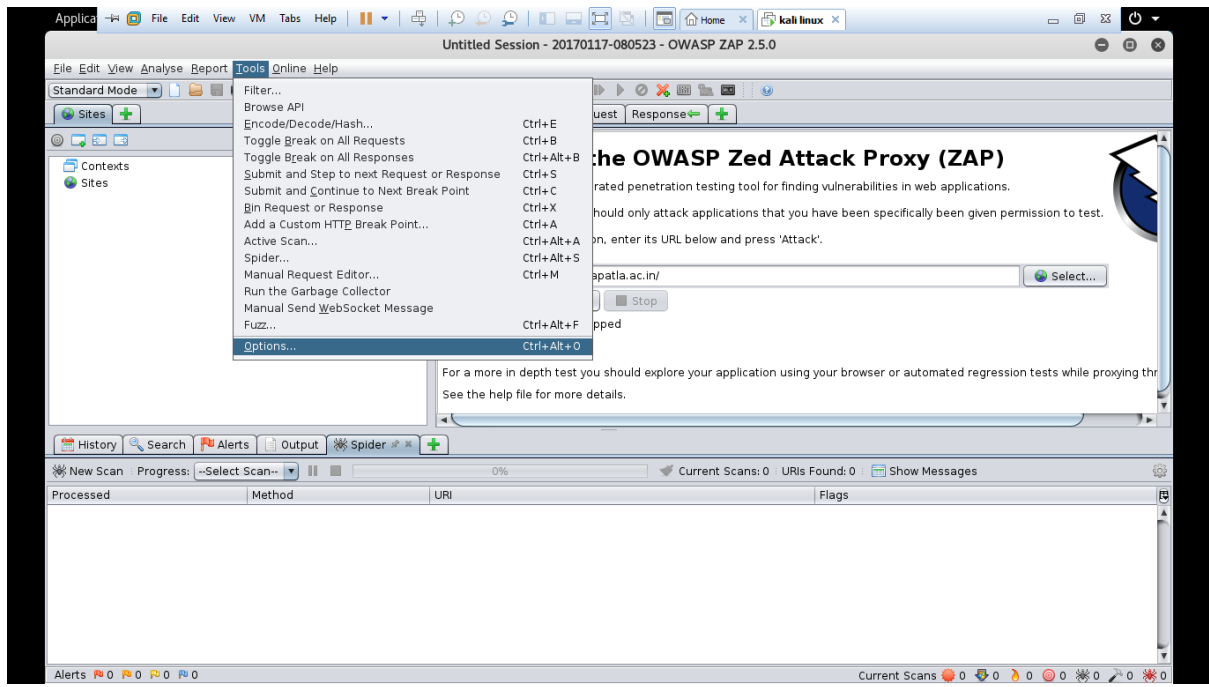
Close all active Firefox browser sessions

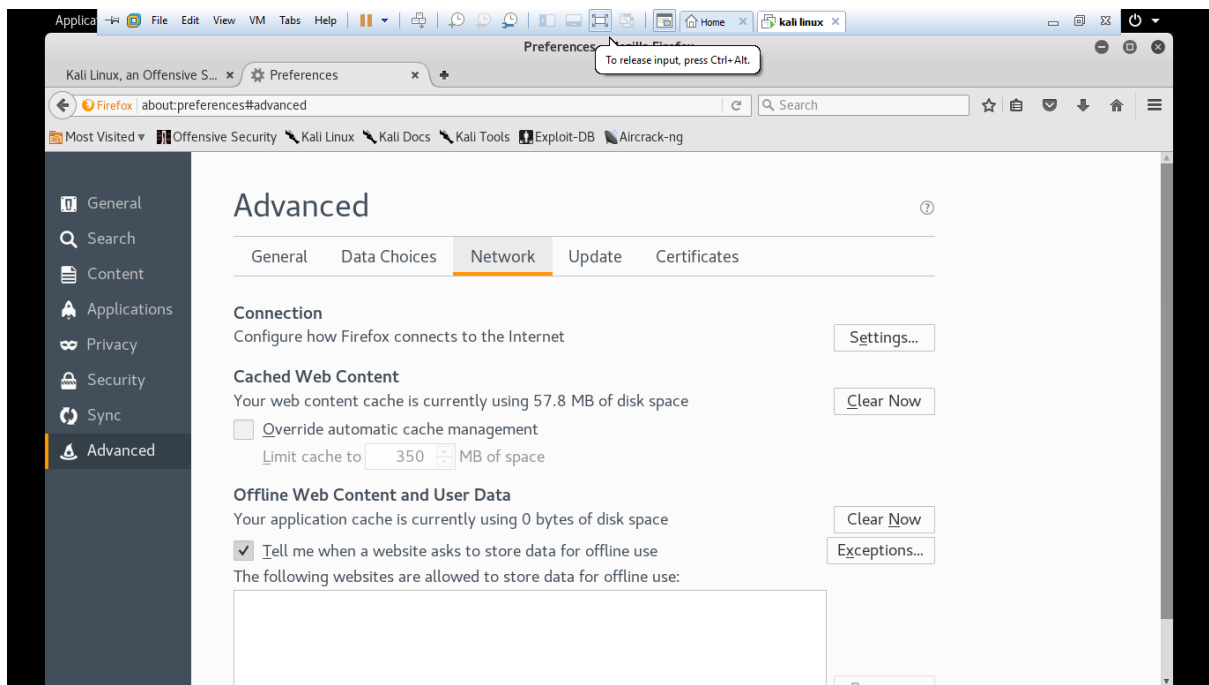
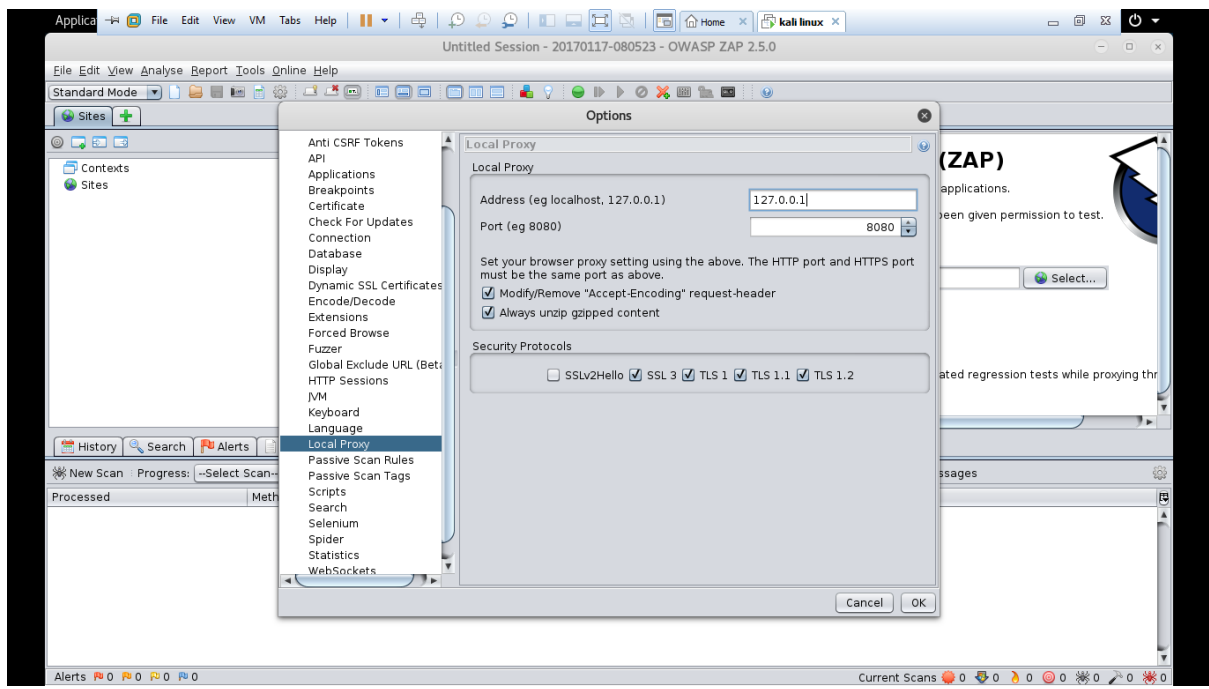
ZAP tool -> Tools Menu -> Options -> Local Proxy -> Change Address = 127.0.0.1 Port = 8080.

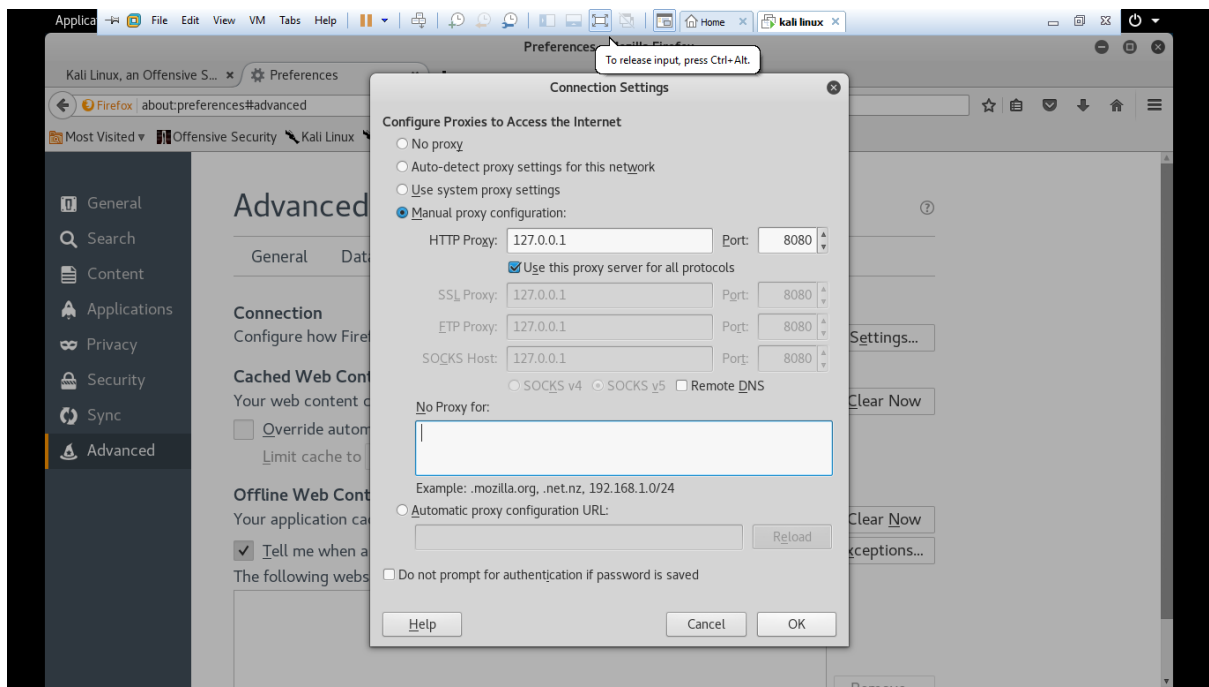
Mozilla browser -> Tools Menu -> Options -> Advanced tab -> Network -> Settings -> Select Manual Proxy configuration:- HTTP Proxy = 127.0.0.1 Port = 8080.

Now try to connect to your application using your browser.

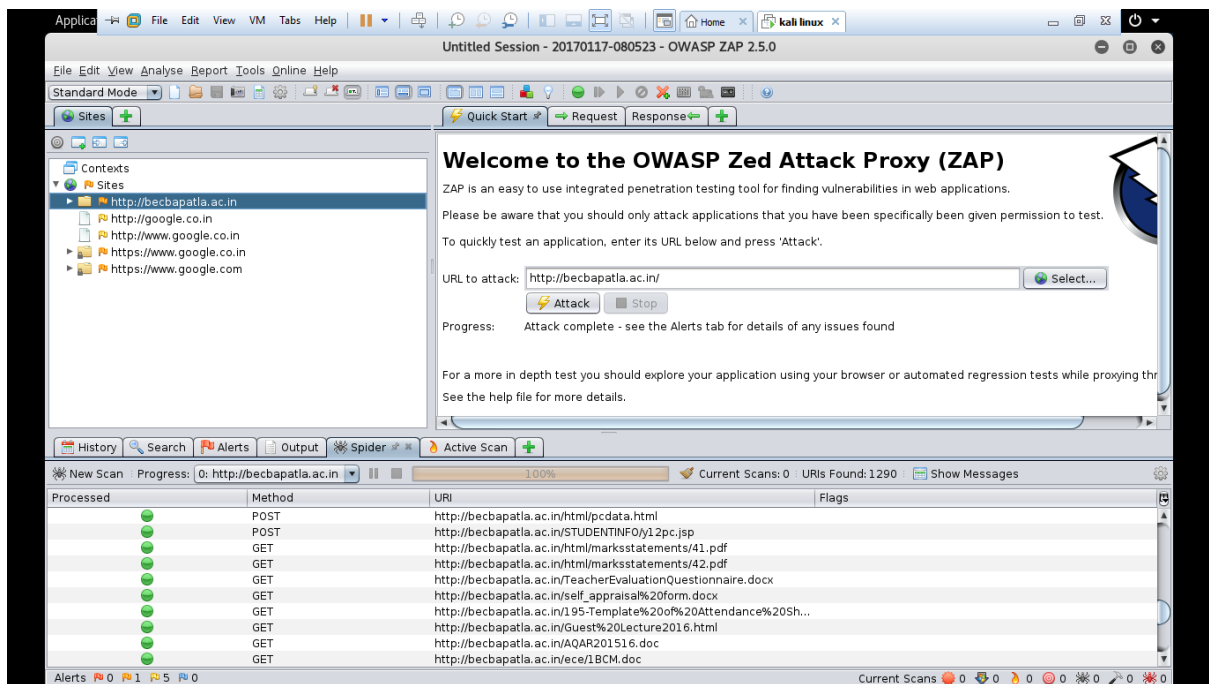
If you can't connect to it then check your proxy settings again. You will need to check your browser's proxy settings, and ZAP's proxy settings. It's also worth checking that the application that you are trying to test is running!

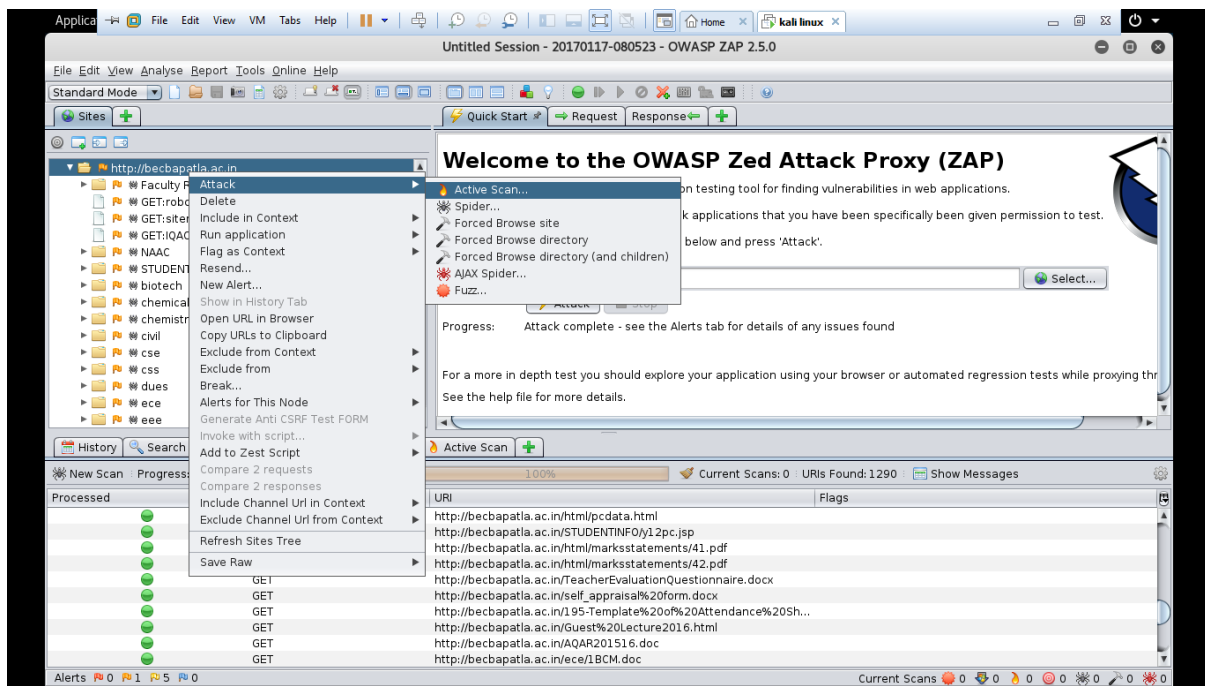
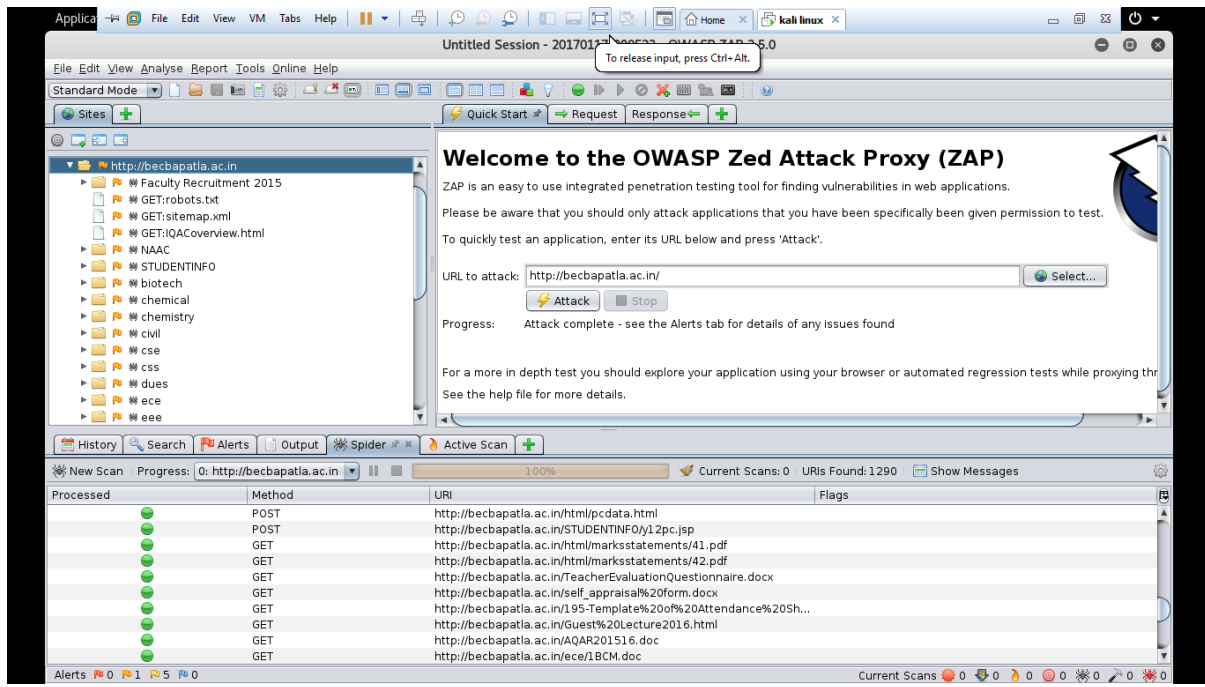






When you have successfully connected to your application you will see one or more lines in ZAP's Sites and History tabs.
Note that most of ZAP's tabs provide additional functionality that could be accessed via 'right click' menus.





Save the ZAP session

Once you have manually explored the application it would be a good time to save the ZAP session so that you can look at it again.

If your application has multiple roles then you should explore it with each role and save the sessions in separate files.

Generating a Report:

ZAP tool -> Report -> Generate HTML report (Any other options listed) -> Save and share the report.

Authentication, session and User management using ZAP

1) Context: Represents a Web application

2) Session Management Method: How are the web Sessions identified by the server and handle requests

Example: cookie based using query parameters

3) Authentication Method: How is a new session established?

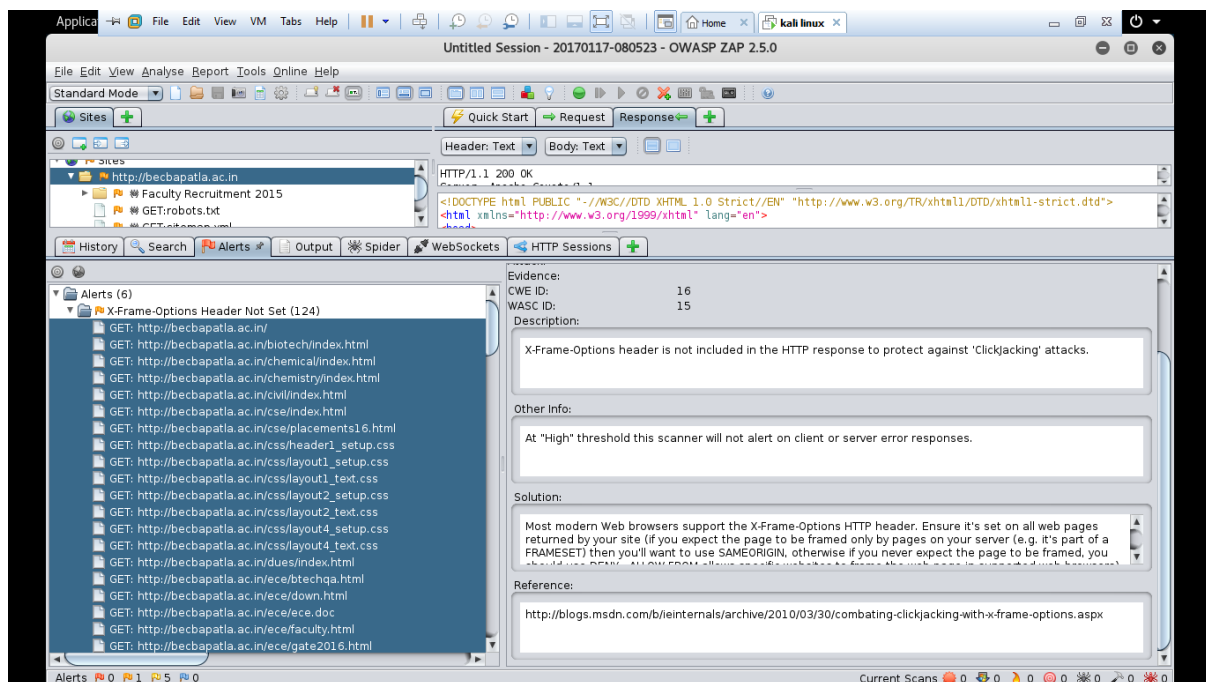
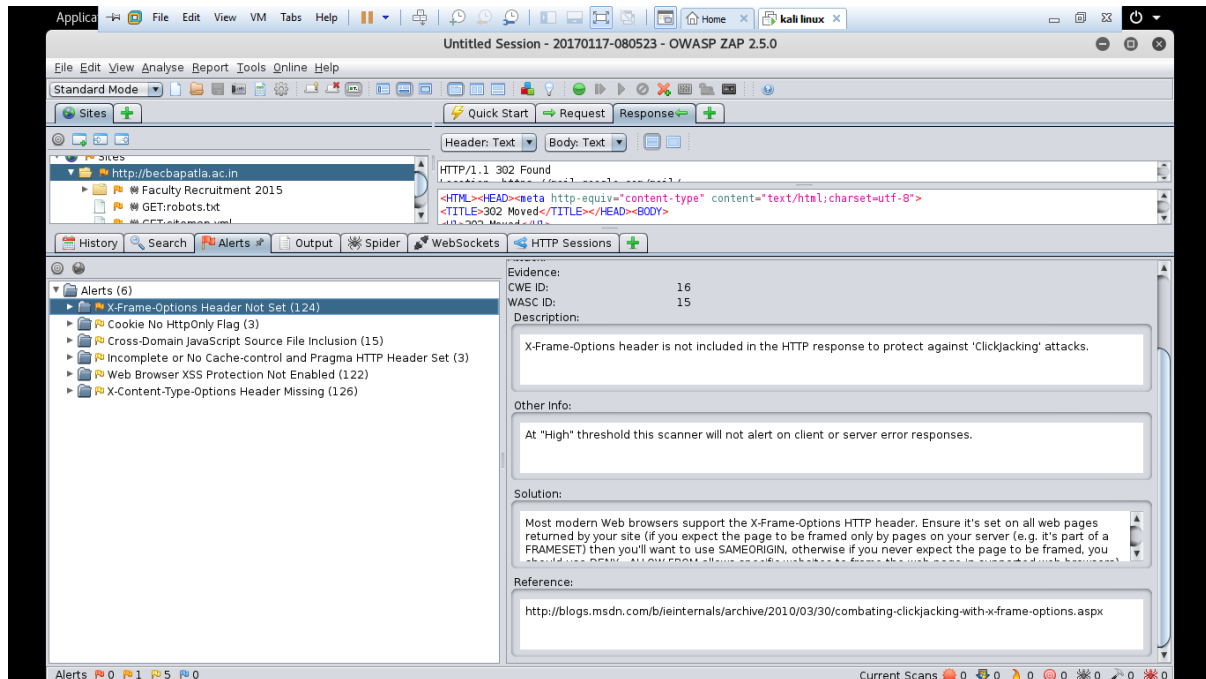
It could be either Form based authentication method, HTTP based or oath methods.

4) User Management: Handling users of web application that could be used for executing actions

Example: user name/password pair

Missing Parameters in the Web Application:

1). X-Frame-options Header Not Set



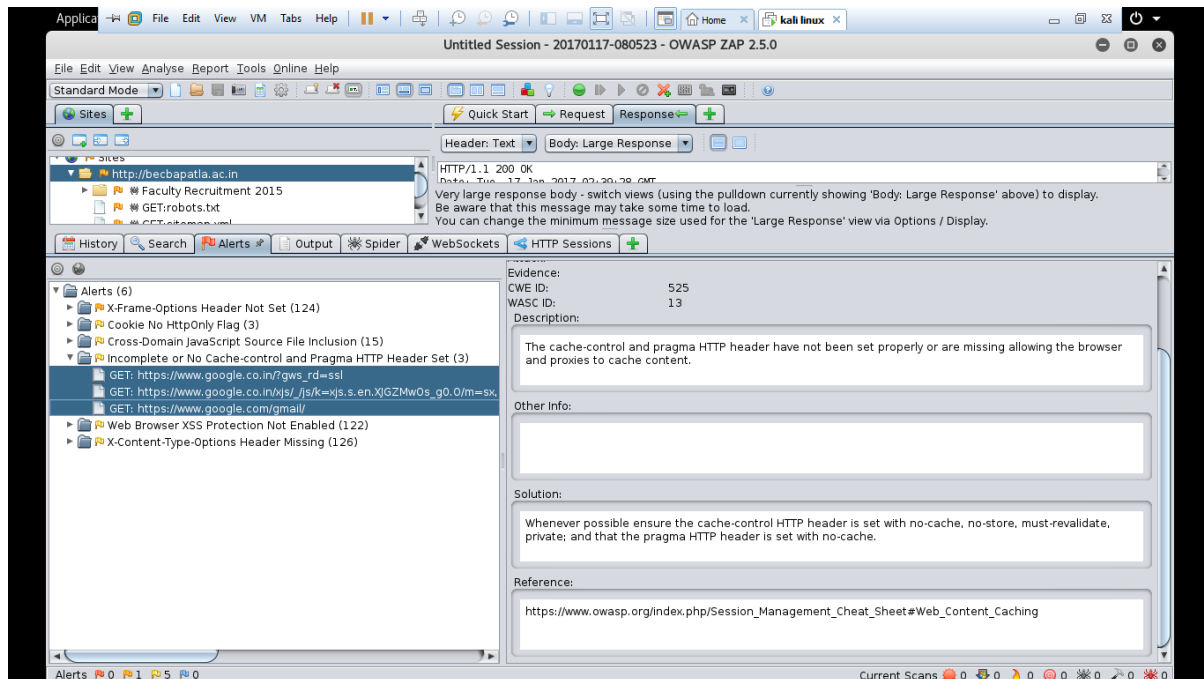
2) Cookie No Http only Flag

The screenshot shows the OWASP ZAP 2.5.0 interface. The 'Alerts' pane on the left lists several alerts, with 'Cookie No HttpOnly Flag (3)' selected. The main pane displays the details of this alert. The 'Evidence' section shows a cookie: `JSESSIONID=4078C3C72F05B92A221FB40DF8F71A67; Path=/'`. The 'Description' section explains that a cookie has been set without the HttpOnly flag, which means it can be accessed by JavaScript. If a malicious script can be run on this page, the cookie will be accessible and can be transmitted to another site. If this is a session cookie, session hijacking may be possible. The 'Solution' section advises ensuring that the HttpOnly flag is set for all cookies. The 'Reference' section provides a link to <http://www.owasp.org/index.php/HttpOnly>.

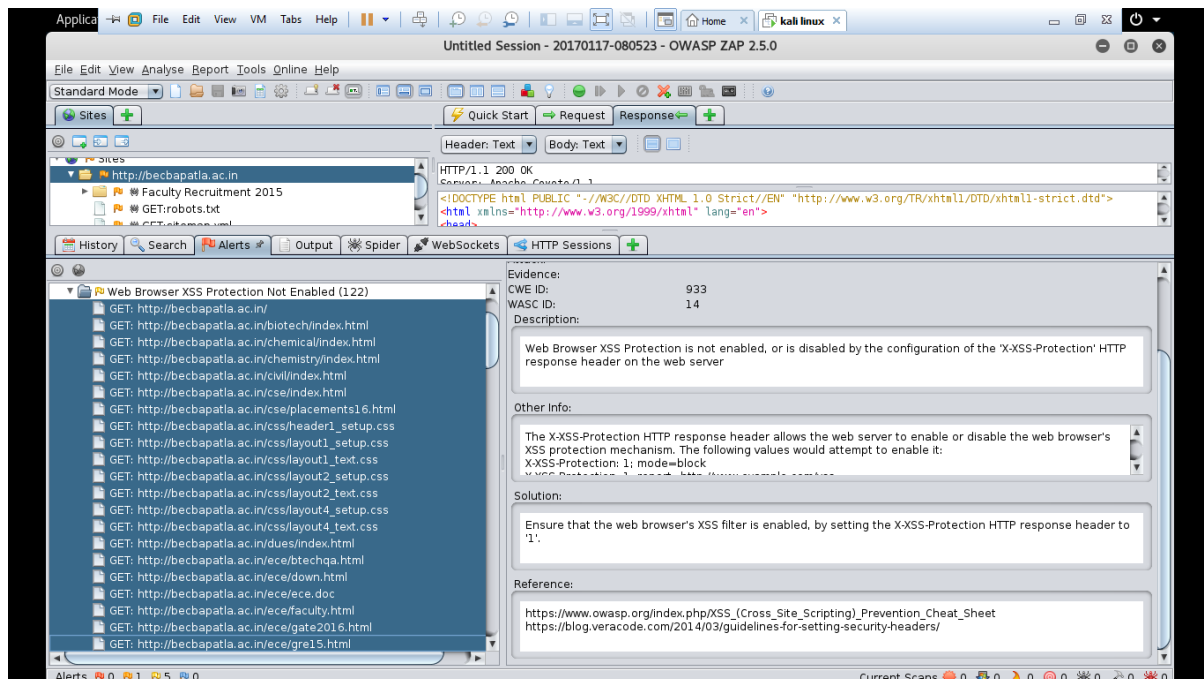
4).Cross Domain JavaScript Source File Inclusion.

The screenshot shows the OWASP ZAP 2.5.0 interface. The 'Alerts' pane on the left lists several alerts, with 'Cross-Domain JavaScript Source File Inclusion (15)' selected. The main pane displays the details of this alert. The 'Evidence' section shows a script tag: `<script type='text/javascript' src='http://ajax.googleapis.com/ajax/libs/jquery/1.3.2/jquery.min.js'></script>`. The 'Description' section explains that the page includes one or more script files from a third-party domain. The 'Solution' section advises ensuring JavaScript source files are loaded from only trusted sources, and the sources can't be controlled by end users of the application. The 'Reference' section is empty.

5).Incomplete or No Cache-Control and Program HTTP Header set



6).Web Browser XSS Protection Not Enabled.



The screenshot shows the OWASP ZAP 2.5.0 application. The main window displays a list of alerts on the left, with the 'X-Content-Type-Options Header Not Set' alert selected. The right pane shows the details of this alert, including the HTTP response body and the specific issue description.

Alert Details:

- Alerts (6):**
 - X-Frame-Options Header Not Set (124)
 - Cookie No HttpOnly Flag (3)
 - Cross-Domain JavaScript Source File Inclusion (15)
 - Incomplete or No Cache-control and Pragma HTTP Header Set (3)
 - Web Browser XSS Protection Not Enabled (122)
 - X-Content-Type-Options Header Missing (126)**

Selected Alert Details:

- GET: http://becbapatia.ac.in/**
- GET: http://becbapatia.ac.in/biotech/index.html**
- GET: http://becbapatia.ac.in/chemical/index.html**
- GET: http://becbapatia.ac.in/chemistry/index.html**
- GET: http://becbapatia.ac.in/civil/index.html**
- GET: http://becbapatia.ac.in/cse/index.html**
- GET: http://becbapatia.ac.in/cse/placements16.html**
- GET: http://becbapatia.ac.in/css/header1_setup.css**
- GET: http://becbapatia.ac.in/css/layout1_setup.css**
- GET: http://becbapatia.ac.in/css/layout1_text.css**
- GET: http://becbapatia.ac.in/css/layout2_setup.css**
- GET: http://becbapatia.ac.in/css/layout2_text.css**
- GET: http://becbapatia.ac.in/css/layout4_setup.css**
- GET: http://becbapatia.ac.in/css/layout4_text.css**
- GET: http://becbapatia.ac.in/dues/index.html**

Evidence:

CWE ID:	16
WASC ID:	15

Description:

The Anti-MIME-Sniffing header X-Content-Type-Options was not set to 'nosniff'. This allows older versions of Internet Explorer and Chrome to perform MIME-sniffing on the response body, potentially causing the response body to be interpreted and displayed as a content type other than the declared content type.

Other Info:

This issue still applies to error type pages (401, 403, 500, etc) as those pages are often still affected by injection issues, in which case there is still concern for browsers sniffing pages away from their actual content type.

Solution:

Ensure that the application/web server sets the Content-Type header appropriately, and that it sets the X-Content-Type-Options header to 'nosniff' for all web pages.

Reference:

<http://msdn.microsoft.com/en-us/library/ie/g622941%28vs.85%29.aspx>
https://www.owasp.org/index.php/List_of_useful_HTTP_headers