

Ethical Hacking Lab

Module 5: Hacking web servers, web applications

Assignment 5: Use of software tools and commands for hacking web servers and web applications, and generating an analysis report.

1. Hacking a Website Using Remote File Inclusion

Aim: To understand and demonstrate the exploitation of Remote File Inclusion vulnerabilities in web applications, highlighting the potential risks associated with improper input validation and file handling

Theory:

Remote File Inclusion (RFI) is a type of vulnerability that allows an attacker to include a file on a web server through the URL parameters. This type of attack is typically found in web applications that allow the inclusion of files based on user input without proper validation. RFI can lead to severe consequences, such as unauthorized access to the server, data manipulation, and execution of malicious scripts.

Key Concepts:

- Inclusion Vulnerability: Occurs when an application includes files based on user input without sufficient checks.
- File Inclusion: Attackers can specify external files (hosted on their servers) to be included in the application.
- Potential Risks: Execution of arbitrary code, data theft, server takeover, etc.

Steps to be followed:

1. Install XAMPP:

- Open the shell and type:
`# mysql -u root`
- To view databases, type:
`MariaDB [(none)]> show databases;`
- Create a new database with:
`MariaDB [(none)]> create database dvwa;`

2. Download DVWA:

- Search for "DVWA master zip" on Google and download it.
- DVWA (Damn Vulnerable Web Application) is a tool designed to help security professionals test their skills, assist web developers in understanding vulnerabilities, and help students learn about web application security.

3. Set Up DVWA:

- Copy the DVWA folder to C:/xampp/htdocs.
- Rename the file C:/xampp/htdocs/dvwa/config/config.inc.php.dist to config.inc.php.
- Check DVWA database settings.

4. Enable URL Inclusion:

- In the php.ini configuration file (C:/xampp/php/php.ini), enable URL inclusion.

5. Access DVWA in the Browser:

- Go to: <http://localhost/dvwa-master/setup.php>
- Click "Create Database."
- After this, you will be redirected to the DVWA login page. The default credentials are:
 - Username: admin
 - Password: password

6. Remote File Inclusion (RFI):

- Set the DVWA security level to low.
- Click on "File Inclusion."
- In the address bar, set the page attribute to: page=https://www.google.com

7. Local File Inclusion (LFI):

- Set the page attribute to a local file: page=file:///C:/xampp/htdocs/applications.html

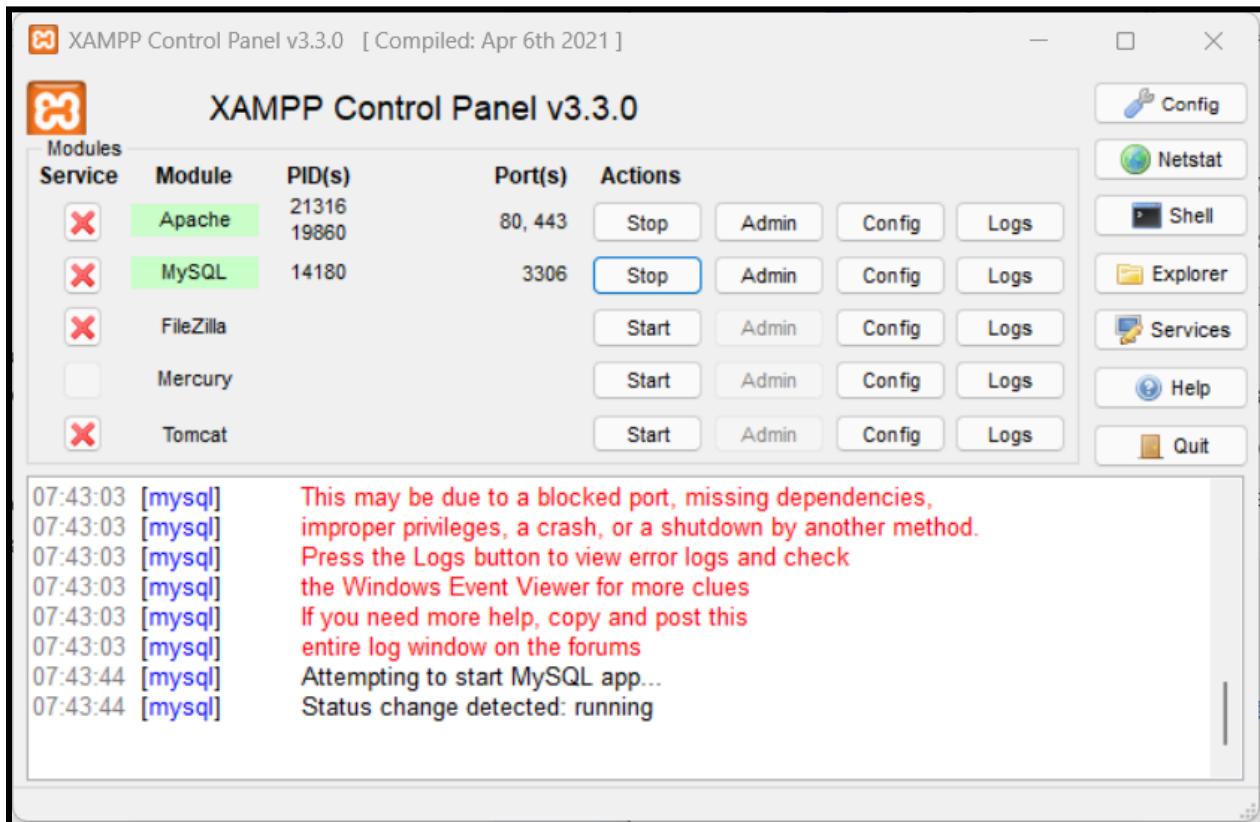
8. Examples of URL Inclusion:

- For remote file inclusion:

<http://localhost/dvwa/vulnerabilities/fi/?page=https://www.google.com/>

- For local file inclusion:

<http://localhost/dvwa/vulnerabilities/fi/?page=file:///C:/xampp/htdocs/applications.html>

Output:

```

Administrator: XAMPP for Windows - mysql -u root
Setting environment for using XAMPP for Windows.
itsak@DESKTOP-J910NPG c:\xampp
# mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.4.28-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

```

```

Administrator: XAMPP for Windows - mysql -u root
MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| data1         |
| information_schema |
| mysql          |
| performance_schema |
| phpmyadmin     |
| result         |
| student        |
| test           |
| visitor_counter |
+-----+
9 rows in set (0.007 sec)

```

```
MariaDB [(none)]> create database dvwa;
Query OK, 1 row affected (0.001 sec)
```

localhost / 127.0.0.1 / dvwa | ph

phpMyAdmin

Server: 127.0.0.1 » Database: dvwa

No tables found in database.

Create new table

Table name: dvwa Number of columns: 4 Create

Google DVWA master zip

All Videos Images News Shopping Web Maps More Tools

[GitHub](https://www.google.co.in/search?q=DVWA+master+zip&sca_esv=08df9a6e0ef724db&sxsrf=ADLYWIKVOgj0k6ant_bKuKXrOQE...) https://github.com/digininja/DVWA

digininja/DVWA: Damn Vulnerable Web Application (DVWA) ✓

The aim of DVWA is to practice some of the most common web vulnerabilities, with various levels of difficulty, with a simple straightforward interface. Please ...

The prebuilt Docker Images · Index.php · Releases 9 · Login.php

GitHub - digininja/DVWA: Damn Vulnerable Web Application (DVWA)

Product Solutions Resources Open Source Enterprise Pricing

digininja / DVWA Public

Code Issues 1 Pull requests 3 Actions Projects Wiki Security Insights

master 2 Branches 10 Tags

digininja Merge pull request #654 from digininja/encryption

.github ci(docker): also tag

config refactor: allow reading

database tidy the create script

docs docs: add guides to

dvwa don't title if title is e

external/recaptcha removed PHP IDS library

Clone HTTPS GitHub CLI

https://github.com/digininja/DVWA.git

Clone using the web URL

Open with GitHub Desktop

Download ZIP

About

Damn Vulnerable Web Application (DVWA)

training php security hacking

sql-injection infosec dvwa

Readme

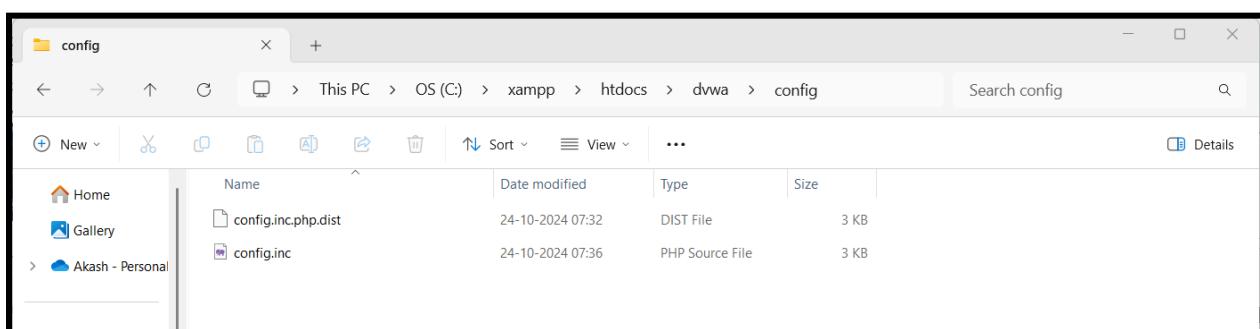
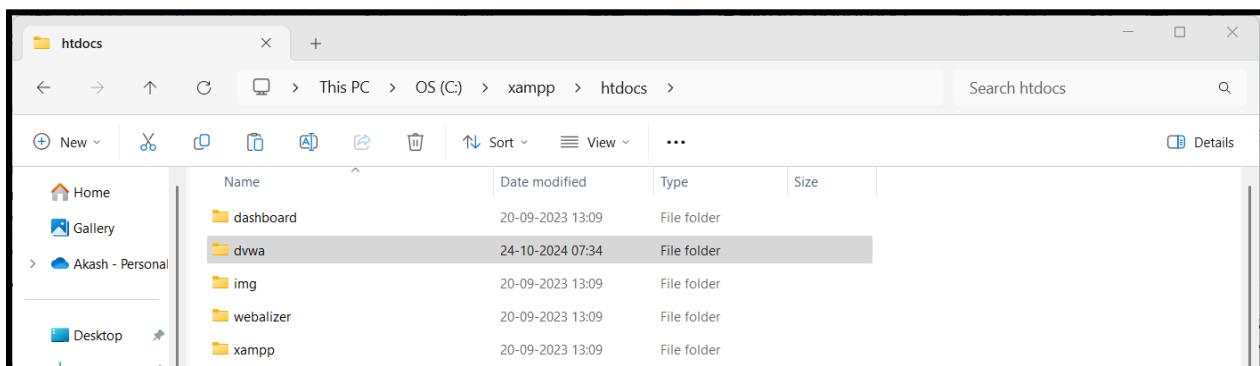
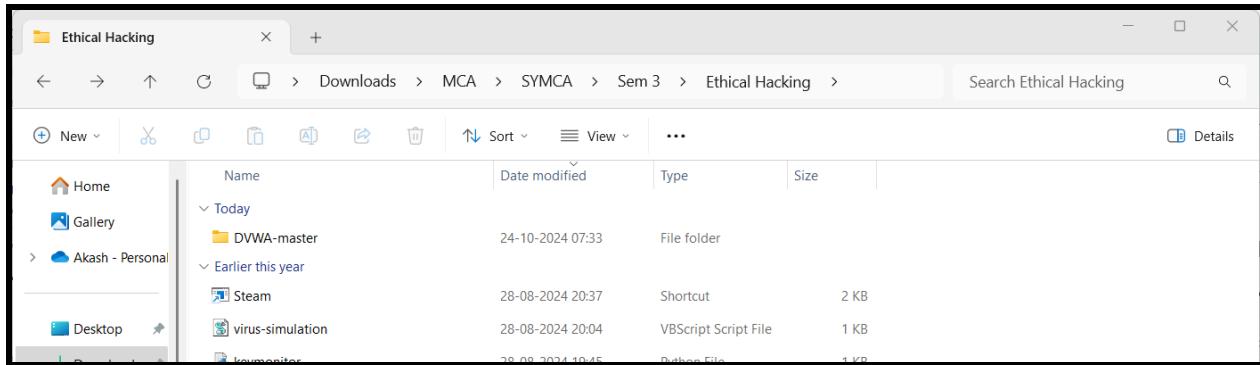
GPL-3.0 license

Security policy

Activity

10.2k stars

309 watching



```

<?php

# If you are having problems connecting to the MySQL database and all of the variables below are correct
# try changing the 'db_server' variable from localhost to 127.0.0.1. Fixes a problem due to sockets.
# Thanks to @digininja for the fix.

# Database management system to use
$DBMS = 'MySQL';
#$DBMS = 'PGSQL'; // Currently disabled

# Database variables
# WARNING: The database specified under db_database WILL BE ENTIRELY DELETED during setup.
# Please use a database dedicated to DVWA.
#
# If you are using MariaDB then you cannot use root, you must use create a dedicated DVWA user.
# See README.md for more information on this.
$_DVWA = array();
$_DVWA[ 'db_server' ] = getenv('DB_SERVER') ?: '127.0.0.1';
$_DVWA[ 'db_database' ] = 'dwqa';
$_DVWA[ 'db_user' ] = 'root';
$_DVWA[ 'db_password' ] = '';
$_DVWA[ 'db_port' ] = '3306';

```

Screenshot of a Windows File Explorer showing the contents of the XAMPP PHP directory. The directory path is C:\xampp\php. The files listed are:

- php.exe (Application, 136 KB)
- php.ini (Configuration settings, 74 KB)
- php.ini-development (INI-DEVELOPMENT, 73 KB)
- php.ini-production (INI-PRODUCTION, 73 KB)
- php8apache2_4.dll (Application extension, 35 KB)

Screenshot of a code editor showing the configuration file `php.ini`. The file contains the following configuration settings:

```

; Whether to allow the treatment of URLs (like http:// or ftp://) as files.
; http://php.net/allow-url-fopen
allow_url_fopen=On

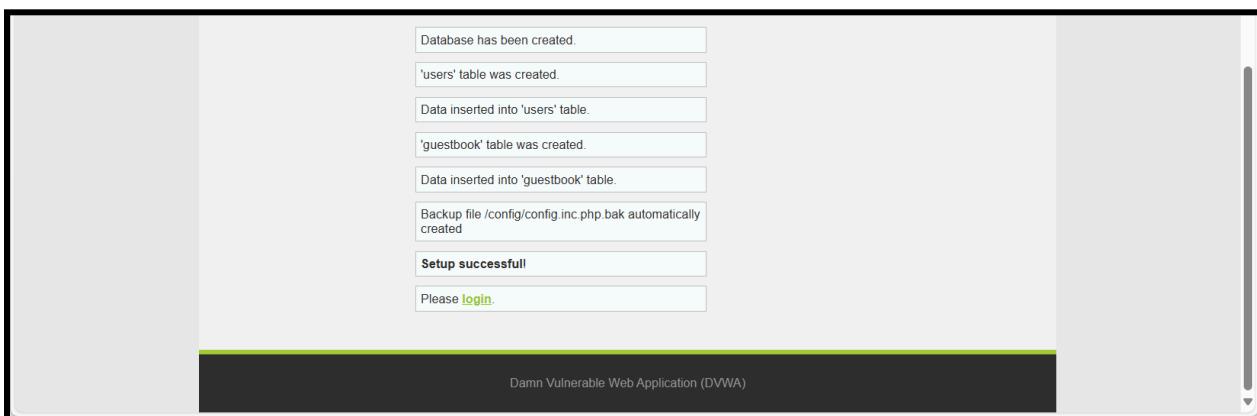
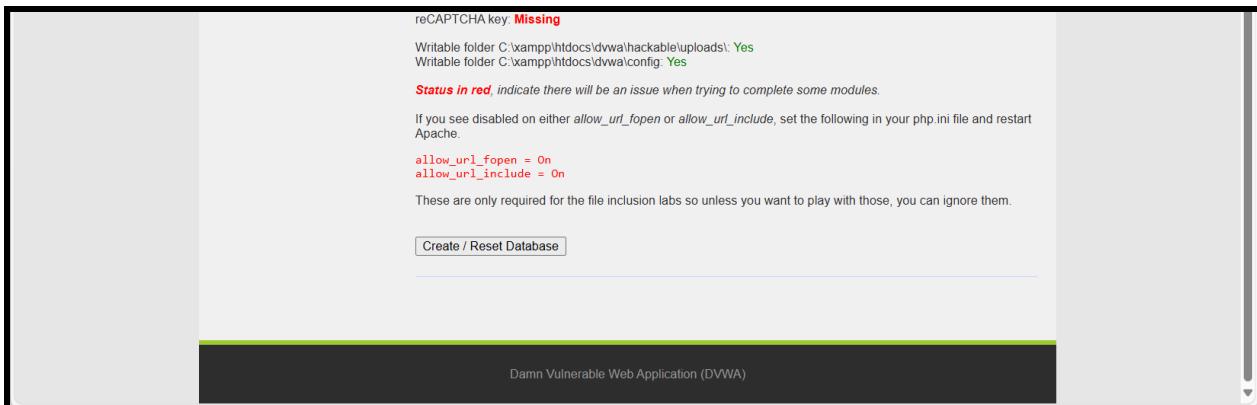
; Whether to allow include/require to open URLs (like http:// or ftp://) as files.
; http://php.net/allow-url-include
allow_url_include=On

; Define the anonymous ftp password (your email address). PHP's default setting
; for this is empty.

```


Screenshot of a web browser showing the DVWA setup page at `localhost/dvwa/setup.php`. The page includes the following sections:

- Database Setup**: Instructions for creating or resetting the database.
- Setup Check**: Checks system requirements and module status. It shows the following information:
 - Web Server SERVER_NAME: localhost
 - Operating system: Windows
 - PHP version: 8.0.28
 - PHP functions display_errors, display_startup_errors, allow_url_include, and allow_url_fopen are Enabled.
 - PHP module gd is Missing - Only an issue if you want to play with captchas.
 - PHP modules mysqli and pdo_mysql are Installed.
 - Backend database: MySQL/MariaDB
 - Database username: root
 - Database password: blank
 - Database database: dvwa
 - Database host: 127.0.0.1
 - Database port: 3306
 - reCAPTCHA key: Missing
 - Writable folder C:\xampp\htdocs\dvwa\hackable\uploads: Yes
 - Writable folder C:\xampp\htdocs\dvwa\config: Yes
- A note at the bottom states: "Status in red indicate there will be an issue when trying to complete some modules."



localhost / 127.0.0.1 / dvwa / user

localhost/phpmyadmin/index.php?route=/sql&pos=0&db=dwva&table=users

phpMyAdmin

Showing rows 0 - 4 (5 total, Query took 0.0005 seconds.)

SELECT * FROM `users`

Profile [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	user_id	first_name	last_name	user	password	avatar	last_login
<input type="checkbox"/>	1	admin	admin	admin	5f4dcc3b5aa765d61d8327deb882cf99	/dwva/hackable/users/admin.jpg	2024-10-24 07:49:45
<input type="checkbox"/>	2	Gordon	Brown	gordonb	e99a18c428cb38d5f260853678922e03	/dwva/hackable/users/gordonb.jpg	2024-10-24 07:49:45
<input type="checkbox"/>	3	Hack	Me	1337	8d3533d75ae2c3966d7e0d4fcc69216b	/dwva/hackable/users/1337.jpg	2024-10-24 07:49:45
<input type="checkbox"/>	4	Pablo	Picasso	pablo	0d107d09f5bbe40cade3de5c71e9e9b7	/dwva/hackable/users/pablo.jpg	2024-10-24 07:49:45
<input type="checkbox"/>	5	Bob	Smith	smithy	5f4dcc3b5aa765d61d8327deb882cf99	/dwva/hackable/users/smithy.jpg	2024-10-24 07:49:45

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

With selected: Edit Copy Delete

Query results operations

Console

The screenshot shows a web browser window with the title "Login :: Damn Vulnerable Web Application". The URL in the address bar is "localhost/dvwa/login.php". The page features the DVWA logo at the top. Below it is a form with two input fields: "Username" containing "admin" and "Password" containing "admin". A "Login" button is located below the password field. At the bottom of the page, there is a link "Damn Vulnerable Web Application (DVWA)".

The screenshot shows a web browser window with the title "Welcome :: Damn Vulnerable Web Application". The URL in the address bar is "localhost/dvwa/index.php". The page features the DVWA logo at the top. On the left side, there is a vertical navigation menu with the following items: Home (highlighted in green), Instructions, Setup / Reset DB, Brute Force, Command Injection, CSRF, File Inclusion, File Upload, Insecure CAPTCHA, SQL Injection, SQL Injection (Blind), Weak Session IDs, XSS (DOM), XSS (Reflected), XSS (Stored), CSP Bypass, JavaScript, Authorisation Bypass, Open HTTP Redirect, Cryptography, DVWA Security, and DVWA Info. The main content area contains the following sections: "Welcome to Damn Vulnerable Web Application!", "General Instructions", "WARNING!", and "Disclaimer".

DVWA Security :: Damn Vulnerable Web Application

DVWA Security

Security Level

Security level is currently: **low**

You can set the security level to low, medium, high or impossible. The security level changes the vulnerability level of DVWA.

1. Low - This security level is completely vulnerable and **has no security measures at all**. Its use is to be as an example of how web application vulnerabilities manifest through bad coding practices and to serve as a platform to teach or learn basic exploitation techniques.

2. Medium - This setting is mainly to give an example to the user of **bad security practices**, where the developer has tried but failed to secure an application. It also acts as a challenge to users to refine their exploitation techniques.

3. High - This option is an extension to the medium difficulty, with a mixture of **harder or alternative bad practices** to attempt to secure the code. The vulnerability may not allow the same extent of the exploitation, similar in various Capture The Flags (CTFs) competitions.

4. Impossible - This level should be **secure against all vulnerabilities**. It is used to compare the vulnerable source code to the secure source code.

Prior to DVWA v1.9, this level was known as 'high'.

Low

Security level set to low

DVWA Security

DVWA Info

DVWA Security :: Damn Vulnerable Web Application

Vulnerability: File Inclusion

[file1.php] - [file2.php] - [file3.php]

More Information

- [Wikipedia - File inclusion vulnerability](#)
- [WSTG - Local File Inclusion](#)
- [WSTG - Remote File Inclusion](#)

File Inclusion

Google

Search Images Maps Play YouTube News Gmail Drive More · Sign in

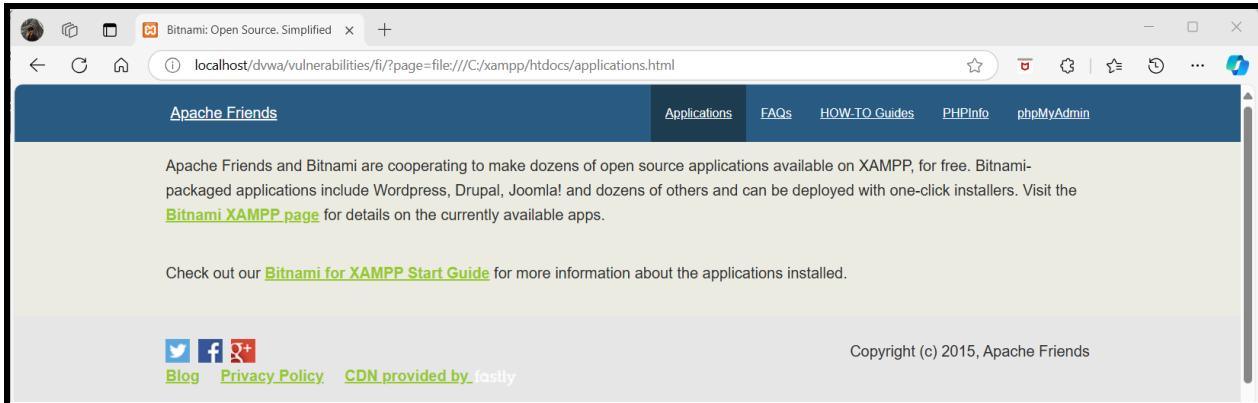
Advanced search

Google Search I'm Feeling Lucky

Google offered in: हिन्दी बांग्लা ବ୍ୟାଙ୍ଗଳ ମରାଠୀ ତମିଳ ଗୁଜରାତୀ କଣ୍ଠେ ମହାରାଷ୍ଟ୍ର ପଞ୍ଜାବୀ

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2. Using Firefox to Disguise as a Google Bot to View Hidden Content on a Website

Aim: To understand how web applications can restrict access to certain content based on user-agent detection, and to demonstrate how changing the user agent in Firefox can bypass these restrictions to access hidden content

Theory:

Many websites serve different content to users based on their user agent, which identifies the browser, operating system, and device being used. For example, a website might display different pages or hide certain content from non-bot users to protect sensitive information or to manage content delivery.

By disguising as a Google bot (or another search engine bot), an ethical hacker can test the website's defenses against user-agent filtering and potentially access restricted content.

Key Concepts:

- User-Agent String: A line of text sent by a web browser to identify itself to the web server.
- User-Agent Spoofing: The practice of changing the user agent string to impersonate another browser or device.
- Search Engine Bots: Automated programs used by search engines to crawl and index web content.

Steps to be followed:

1. Determine the User Agent in Edge:

- Open Edge and visit: <http://www.proxyserverprivacy.com/>
- Select "Detector Proxy" and then "Advanced Proxy Detector."

2. Find the Googlebot User Agent String:

- Visit: <http://useragentstring.com/>
- Locate the string for Googlebot:
Googlebot/2.1 (+http://www.googlebot.com/bot.html)

3. Configure Edge User Agent:

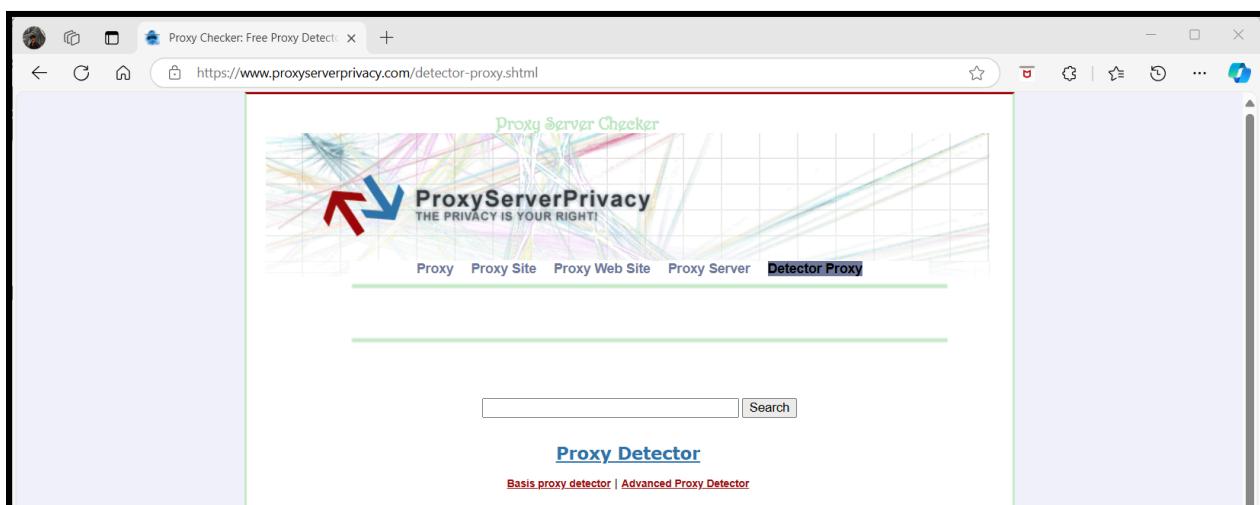
- Open Developer Tools:
 - Press F12 or right-click on any webpage and select Inspect.

- Navigate to the "Network Conditions":
 - Click on the three dots (More options) in the Developer Tools window.
 - Select More tools > Network conditions.
- Change the User Agent:
 - Uncheck Use browser default under User agent.
 - Enter the following string to emulate Googlebot:
Googlebot/2.1 (+http://www.googlebot.com/bot.html)

4. Verify the Change:

- To verify the user agent change, visit:

Output:



The screenshot shows a web browser window with the URL <https://www.proxyserverprivacy.com/adv-free-proxy-detector.shtml>. The page title is "Proxy Server Checker" and the sub-section is "Proxy Checker - Advanced Free Proxy Detector". It features a logo with two red arrows pointing up and down, and the text "ProxyServerPrivacy THE PRIVACY IS YOUR RIGHT!". Below the title, there are tabs: "Proxy", "Proxy Site", "Proxy Web Site", "Proxy Server", and "Detector Proxy" (which is highlighted). The main content area starts with a large letter "P" and text about proxy detection. To the right is a blue circular icon with the text "ProxyServerPrivacy" and "detector". The bottom of the page includes links for "Basic free proxy.detector" and "Advanced Free Proxy Detector".

The screenshot shows a "Free Proxy Checker Detection" page. It displays the user's IP address as 103.210.202.135 and the host as 103.210.202.135. It lists various proxy-related variables: X_FORWARDED_Variable, HTTP_VIA_Variable, and HTTP_PROXY_CONNECTION, all set to "(none)". The User-Agent string is Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/130.0.0.0 Safari/537.36. The page also shows the port number 31231. A conclusion box states "You do not use proxy". At the bottom, there are links for "Proxy", "Proxy Sites", "Web Proxy Servers", "Proxy Server", "Proxy Setup", "Proxy IP Ranges", "Proxy Software", "Free Proxy", "Detector Proxy", "Basic Free Proxy Detector", "Advanced Free Proxy Detector", "Contact", and "Disclaimer". The footer notes "2006 - 2023 (C) Proxy Server Privacy, All right reserved".

The screenshot shows the "User Agent String.Com" website. The main heading is "User Agent String explained :". Below it, a box contains the user agent string: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/130.0.0.0 Safari/537.36 Edg/130.0.0.0. A text input field says "Copy/paste any user agent string in this field and click 'Analyze'" and an "Analyze" button is next to it. Below the input field, the user agent is identified as "Chrome 130.0.0.0" and "Mozilla". A detailed description follows: "Claims to be a Mozilla based user agent, which is only true for Gecko browsers like Firefox and Netscape. For all other user agents it means 'Mozilla-compatible'. In most cases this is only used for historical reasons. It has no real meaning anymore."

User Agent String explained :

Googlebot/2.1 (+http://www.googlebot.com/bot.html)

Copy/paste any user agent string in this field and click 'Analyze'

Googlebot 2.1

Googlebot	Name : Googlebot
2.1	Googlebot version
http://www.googlebot.com/bot.html	URL

IP address and host name

66.249.64.101 - crawl-66-249-64-101.googlebot.com
66.249.64.102 - crawl-66-249-64-102.googlebot.com
66.249.64.104 - crawl-66-249-64-104.googlebot.com
66.249.64.106 - crawl-66-249-64-106.googlebot.com
66.249.64.108 - crawl-66-249-64-108.googlebot.com
66.249.64.109 - crawl-66-249-64-109.googlebot.com
66.249.64.11 - crawl-66-249-64-11.googlebot.com
66.249.64.110 - crawl-66-249-64-110.googlebot.com
66.249.64.111 - crawl-66-249-64-111.googlebot.com

Caching Disable cache

Network throttling

User agent Use browser default

Accepted Content-Encodings Use browser default
 deflate gzip br zstd

Free Proxy Checker Detection

Your Ip Address: 103.210.202.135

Port: 103.210.202.135

You Connection: Direct

Proxy HTTP_X_FORWARDED_Variable: (none)

Proxy HTTP_VIA_Variable: (none)

Proxy HTTP_PROXY_CONNECTION: (none)

Cache Pragma: max-age=0

Your Browser: Googlebot/2.1 (+http://www.googlebot.com/bot.html)

Type of Your connection: keep-alive

Server Protocol: HTTP/1.1

Your language: en-US;q=0.9,en-IN;q=0.8

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

Accept-Encoding: gzip, deflate, br, zstd

Referer - HTTP Request come from: https://www.proxyserverprivacy.com/detector-proxy.shtml

Your Port: 31376

Conclusion after analyzing ip address:

You do not use proxy

Search

Proxy | Proxy Sites | Web Proxy Servers | Proxy Server | Proxy Setup | Proxy IP Ranges | Proxy Software
Free Proxy | Detector Proxy | Basic Free Proxy Detector | Advanced Free Proxy Detector
Contact | Disclaimer
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3. Using Kaspersky/Quick Heal for a Lifetime Without a Patch

Aim: To investigate the security vulnerabilities in antivirus software like Kaspersky or Quick Heal that can be exploited to bypass licensing mechanisms and to understand the ethical implications of such actions

Theory:

Antivirus software is designed to protect computers from malware and other security threats. However, many users seek ways to use these programs for free or for an extended period beyond their intended licensing. This often involves finding vulnerabilities or exploiting loopholes in the software's licensing system.

Key Concepts:

- Licensing Mechanisms: Systems used by software vendors to control the usage and distribution of their products.
- Patching: The process of applying updates to software to fix vulnerabilities or improve functionality.
- Ethical Implications: Using pirated or patched software can lead to legal consequences and undermine the trust in software developers.

Example of Exploitation: This could involve modifying software files, using key generators, or employing techniques to disable licensing checks.

Steps to be followed:

Kaspersky typically provides a 30-day trial for its antivirus products. To renew your trial license ethically without using patches, follow these steps:

1. Disable Self-Defense:

- Open Kaspersky and go to Settings > Options.
- Turn off Enable Self-Defense and click OK.

2. Edit Registry:

- Open the Registry Editor by pressing Win + R, typing regedit, and hitting Enter.
- Navigate to the following paths:
 - For 32-bit OS:
HKEY_LOCAL_MACHINE\SOFTWARE\KasperskyLab\protected\AVP9\environment

- For 64-bit OS:
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\KasperskyLab\protected\AVP9\environment
- Locate PCID, right-click, and modify the last three or four characters (e.g., change 8F10C22F-6EF6-4378-BAB1-34722F6D454 to a different combination).

3. Restart Kaspersky:

- Right-click the Kaspersky icon in the taskbar and select Exit.
- Reopen Kaspersky and activate the search for a trial license. You should receive a new 30-day trial.

4. Re-enable Self-Defense:

- Go back to Settings and turn Enable Self-Defense back on.

Note: This method modifies registry settings to change your PC's identification to Kaspersky servers, allowing you to obtain a new trial license. Ensure this process is done ethically and within legal boundaries.

Output:

The screenshot shows a web browser window with the URL maroofcreations.weebly.com/how-to-use-kaspersky-for-lifetime-without-patch.html. The page has a header with the logo 'MC MAROOF CREATIONS' and social media links. Below the header is a navigation menu with links for HOME, ETHICAL HACKING TUTORIALS, TIPS & TRICKS, VIDEOS, CONTACT, and BLOG. The main content area features a large image of the Brooklyn Bridge at sunset. The title of the article is 'How to use Kaspersky for Lifetime without Patch'. The article text discusses the steps to bypass Kaspersky's 30-day trial by modifying registry settings. It includes two numbered steps: 1. Delete old key and turn off self defense (Settings-Options in kaspersky and turn off Enable self-defense, and click OK). 2. Open Registry editor (click start in windows menu then goto run and write regedit and click Ok) and go through these : . For 32bit OS: HKEY_LOCAL_MACHINE \ SOFTWARE \ KasperskyLab \ protected \ AVP9 \ environment. To the right of the article, there is a sidebar titled 'Related Posts :-' which lists several other articles from the site.

