

Cyber 357:

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Table of Contents

Introduction.....	3
Network in Depth:.....	3
Tools Used:	4
Assessment Results – OpenVAS.....	4
Assessment Results – Nmap	7
Assessment Results – Nikto.....	9
Assessment Results – WPScan	12
Remediation Recommendations Table.....	14
Remediation Recommendations Information	15
Conclusion	15

Virtual Machines Assessment Report

Introduction

This report aims to identify vulnerabilities inherent in three virtual machines. The three virtual machines are Metasploitable 2, Mr. Robot, and an Ubuntu Server with Samba. To conduct this assessment, a Kali Linux virtual machine will use four tools which are, WPScan, nikto, nmap, and OpenVAS. Through utilizing these tools, an assessment of the virtual environment will be completed to determine the current threats. A remediation plan will thus be developed to remove these threats either tactically or through policy changes. Lastly, a budget will be enacted for the remediation plan to effectively manage resources and not overstep financial bounds.

Network in Depth:

This Virtual Environment is set up on the 192.168.10.0/24 network. The address space available on the DHCP server is 192.168.10.10-20.

1. The Kali Linux virtual machine (version: 2025.1) has an IP address of 192.168.10.15.
2. The Mr. Robot virtual machine (version: Linux 3.10-4.11) has an IP address of 192.168.10.14.
3. The Metasploitable2 virtual machine (version: Ubuntu 8.04) has an IP address of 192.168.10.13.
4. The Ubuntu Server virtual machine (version: Ubuntu 24.04.2 LTS) has an IP address of 192.168.10.12.

Tools Used:

WPScan is an open source WordPress security scanner, that can identify vulnerabilities in systems using WordPress. The version used in this vulnerability assessment was WPScan 3.8.28. Utilizing this tool is simple as one needs to run the command “wpscan –url http://(ipaddress here)”

Nikto is an open source CLI web server vulnerability scanner. The version used in this vulnerability assessment was Nikto 2.5.0. Utilizing this tool is also simple as one needs to run the command “nikto -h (ipaddress here)”.

Nmap is an open source port scanner, which can detect open ports, and services leading to vulnerability discoveries. The version used in this vulnerability assessment was Nmap 7.95. This tool is a bit more versatile so its utilization can differ, however for this assessment the commands “nmap –open (ipaddress here)” and “nmap -sV (ipaddress here)” were used.

OpenVAS is an open source vulnerability scanner, with the capabilities of identifying vulnerabilities and matching them to a database of CVE's. The version used in this vulnerability assessment was OpenVAS 23.16.1. This tool is easy to use once setup, to start the web application use the command (sudo gvm-start). After logging into the web application, one could navigate to the scans tab, and create a new scan with the desired IP address they want to scan.

Assessment Results – OpenVAS

Item	System/ IP	CVE/Vulnerability	Risks	Criticality
1	Mr. Robot/ 192.168.10.14	CVE-2020-35489/ WordPress Contact Form 7 Plugin < 5.3.2 RCE Vulnerability	Attackers can upload files of any type, allowing attackers to inject malicious content.	High 10.0

2	Mr. Robot/ 192.168.10.14	CVE-2023-2996/ WordPress JetPack Plugin Arbitrary File Manipulation Vulnerability	Plugin does not validate uploaded files, allowing users with author roles to manipulate existing files and can rarely cause Remote Code Execution.	High 8.8
3	Mr. Robot/ 192.168.10.14	CVE-2022-3416 & 3417/ WordPress WPTouch Plugin < 4.3.45 Multiple Vulnerabilities	<p>Plugin does not properly validate images, which allows privileged users to upload arbitrary files.</p> <p>Also, the plugin unserialises the content of an imported settings file, which leads to PHP object injections which can lead to an imported malicious settings file.</p>	High 8.8
4	Mr. Robot/ 192.168.10.14	CVE-2021-24307/ WordPress All in One SEO Pack Plugin < 4.1.0.2 RCE Vulnerability	An authenticated attack might execute arbitrary code.	High 8.8
5	Metasploitable2/ 192.168.10.13	CVE-2008-5304 & 5305/ TWiki XSS and Command Execution Vulnerabilities	Variables “-URLPARAM{}%” and “-SEARCH{}%” are not properly sanitized allowing for XSS attacks and eval injection attack respectively.	High 10.0
6	Metasploitable2/ 192.168.10.13	CVE-1998-0618/ The rexec service is running	Rexec has the same kind of functionality that rsh has: you can execute shell commands on a remote computer.	High 10.0
7	Metasploitable2/ 192.168.10.13	CVE-2012-1823 & 2311 & 2336 & 2335 /PHP < 5.3.13, 5.4.x < 5.4.3 Multiple Vulnerabilities - Active Check	Exploiting this issue allows remote attackers to view the source code files in the context of the server process. It can allow attackers to obtain sensitive information and run arbitrary PHP code. Other attacks are also possible.	High 9.8
8	Metasploitable2/ 192.168.10.13	CVE-2001-0645/ MySQL / MariaDB Default Credentials (MySQL Protocol)	Remote MySQL was using default credentials.	High 9.8
9	Ubuntu Server/ 192.168.10.12	CVE-1999-0524/ ICMP Timestamp Reply Information Disclosure	This information could be used to exploit weak time-based random number generators in other services.	Low 2.1

OpenVAS Findings Summary: Through using the tool OpenVAS it was apparent that this was the strongest tool by far to find inherent vulnerabilities in all three virtual machines.

OpenVAS works by scanning a targets network, services, ports, OS, and applications. After identifying the versions of software, it matches those against the CVE database. Then finishes by printing out a report of the targeted system. As for Ubuntu Server, it was by far the least vulnerable system as there was only one CVE matched in the report. Both Metasploitable2 and Mr.Robot were both extremely vulnerable systems, showing severity scores of 10.0 (Highest possible). However, remediation efforts will find that Mr. Robot will be easier to secure as it has less vulnerabilities and they are mostly patch/ update-based solutions. Figure 1, will show the total vulnerabilities in each OpenVAS report.

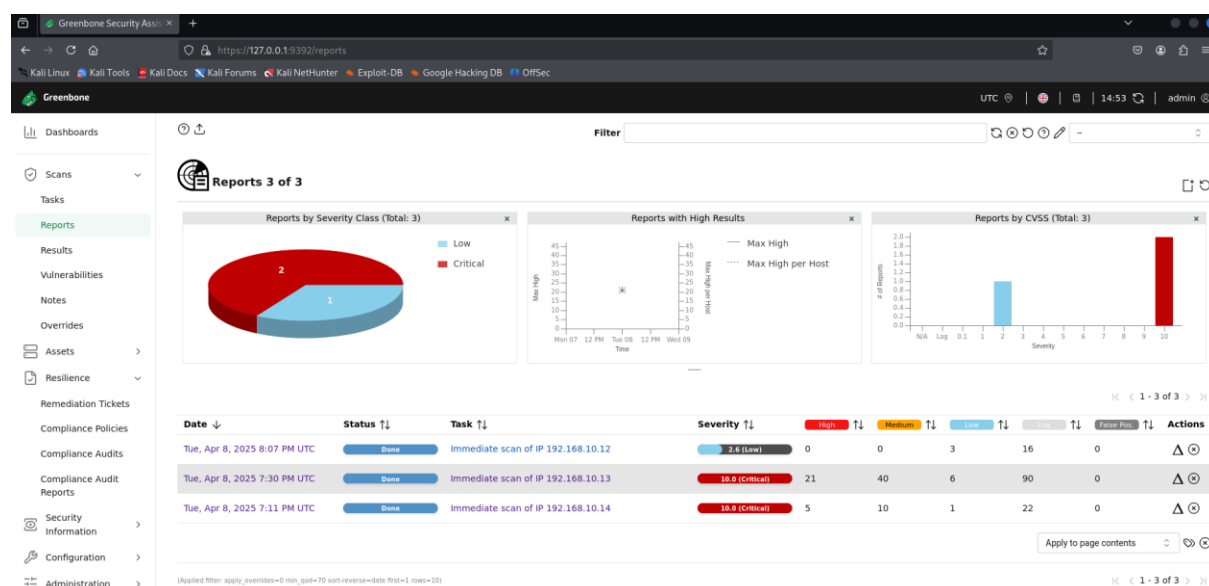


Figure 1 - OpenVAS Reports Dashboard

Assessment Results – Nmap

```

(kali㉿kali)-[~]
$ nmap -sV 192.168.10.12
Starting Nmap 7.95 ( https://nmap.org ) at 2025-04-09 21:16 EDT
Nmap scan report for 192.168.10.12
Host is up (0.00026s latency).
Not shown: 997 closed tcp ports (reset)
PORT      STATE SERVICE      VERSION
22/tcp    open  ssh          OpenSSH 9.6p1 Ubuntu 3ubuntu13.8 (Ubuntu Linux; pro
tocol 2.0)
139/tcp   open  netbios-ssn  Samba smbd 4
445/tcp   open  netbios-ssn  Samba smbd 4
MAC Address: 08:00:27:E6:73:37 (PCS Systemtechnik/Oracle VirtualBox virtual N
IC)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://n
map.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 24.54 seconds

```

Figure 2 - Nmap of Ubuntu Server

```

(kali㉿kali)-[~]
$ nmap -sV 192.168.10.13
Starting Nmap 7.95 ( https://nmap.org ) at 2025-04-09 21:20 EDT
Nmap scan report for 192.168.10.13
Host is up (0.00081s latency).
Not shown: 977 closed tcp ports (reset)
PORT      STATE SERVICE      VERSION
21/tcp    open  ftp          vsftpd 2.3.4
22/tcp    open  ssh          OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp    open  telnet       Linux telnetd
25/tcp    open  smtp         Postfix smtpd
53/tcp    open  domain       ISC BIND 9.4.2
80/tcp    open  http         Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp   open  rpcbind      2 (RPC #100000)
139/tcp   open  netbios-ssn  Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp   open  netbios-ssn  Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp   open  exec         netkit-rsh rexecd
513/tcp   open  login        OpenBSD or Solaris rlogind
514/tcp   open  shell        Netkit rshd
1099/tcp  open  java-rmi     GNU Classpath grmiregistry
1524/tcp  open  bindshell    Metasploitable root shell
2049/tcp  open  nfs          2-4 (RPC #100003)
2121/tcp  open  ftp          ProFTPD 1.3.1
3306/tcp  open  mysql        MySQL 5.0.51a-3ubuntu5
5432/tcp  open  postgresql   PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp  open  vnc          VNC (protocol 3.3)
6000/tcp  open  X11          (access denied)
6667/tcp  open  irc          UnrealIRCd
8009/tcp  open  ajp13        Apache Jserv (Protocol v1.3)
8180/tcp  open  http         Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:56:BA:06 (PCS Systemtechnik/Oracle VirtualBox virtual N
IC)
Service Info: Hosts: metasploitable.localdomain, irc.Metasploitable.LAN; OSs
: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://n
map.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 24.45 seconds

```

Figure 3 - Nmap of Metasploitable2

```
(kali㉿kali)-[~]
$ nmap -sV 192.168.10.14
Starting Nmap 7.95 ( https://nmap.org ) at 2025-04-09 21:23 EDT
Nmap scan report for 192.168.10.14
Host is up (0.00078s latency).
Not shown: 997 filtered tcp ports (no-response)
PORT      STATE SERVICE VERSION
22/tcp    closed ssh
80/tcp    open  http    Apache httpd
443/tcp   open  ssl/http Apache httpd
MAC Address: 08:00:27:3C:5F:B5 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 31.38 seconds
```

Figure 4 - Nmap of Mr. Robot

Nmap Findings Summary: Through the use of the tool Nmap and using the command “nmap -sV (ipaddress here)”, Nmap would find the services and versions running on open ports of targeted machines. For the Ubuntu Server, it found that samba and OpenSSH were running, which could be potential threats if not secured. As for Metasploitable2, figure 3 shows a whole list of open ports with multiple services running on them, showing numerous vulnerabilities. Lastly for Mr. Robot, figure 4 shows that port 80 and 443 are open, which is typically normal.

Assessment Results – Nikto

```

(kali@kali)-[~]
$ nikto -h 192.168.10.12
- Nikto v2.5.0

+ 0 host(s) tested

(kali@kali)-[~]
$ nikto -h 192.168.10.13
- Nikto v2.5.0

+ Target IP: 192.168.10.13
+ Target Hostname: 192.168.10.13
+ Target Port: 80
+ Start Time: 2025-04-09 21:25:26 (GMT-4)

+ Server: Apache/2.2.8 (Ubuntu) DAV/2
+ /: Retrieved x-powered-by header: PHP/5.2.4-2ubuntu5.10.
+ /: The anti-clickjacking X-Frame-Options header is not present. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options
+ /: The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type. See: https://www.netsparker.com/web-vulnerability-scanner/vulnerabilities/missing-content-type-header/
+ /index: Uncommon header 'tcn' found, with contents: list.
+ /index: Apache mod_negotiation is enabled with MultiViews, which allows attackers to easily brute force file names. The following alternatives for 'index' were found: index.php. See: http://www.wisec.it/sectou.php?id=4698ebdc59d15,https://exchange.xforce.ibmcloud.com/vulnerabilities/8275
+ Apache/2.2.8 appears to be outdated (current is at least Apache/2.4.54). Apache 2.2.34 is the EOL for the 2.x branch.
+ /: Web Server returns a valid response with junk HTTP methods which may cause false positives.
+ /: HTTP TRACE method is active which suggests the host is vulnerable to XST. See: https://owasp.org/www-community/attacks/Cross_Site_Tracing
+ /phpinfo.php: Output from the phpinfo() function was found.
+ /doc/: Directory indexing found.
+ /doc/: The /doc/ directory is browsable. This may be /usr/doc. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-1999-0678
+ /?PHPBB5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?PHPE9568F36-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?PHPE9568F34-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?PHPE9568F35-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /phpMyAdmin/changelog.php: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.

```

Figure 5 - Nikto of Ubuntu Server and part of Metasploitable 2

```

+ /phpMyAdmin/ChangeLog: Server may leak inodes via ETags, header found with
file /phpMyAdmin/ChangeLog, inode: 92462, size: 40540, mtime: Tue Dec 9 12:2
4:00 2008. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2003-1418
+ /phpMyAdmin/ChangeLog: phpMyAdmin is for managing MySQL databases, and shou
ld be protected or limited to authorized hosts.
+ /test/: Directory indexing found.
+ /test/: This might be interesting.
+ /phpinfo.php: PHP is installed, and a test script which runs phpinfo() was
found. This gives a lot of system information. See: CWE-552
+ /icons/: Directory indexing found.
+ /icons/README: Apache default file found. See: https://www.vntweb.co.uk/apa
che-restricting-access-to-iconsreadme/
+ /phpMyAdmin/: phpMyAdmin directory found.
+ /phpMyAdmin/Documentation.html: phpMyAdmin is for managing MySQL databases,
and should be protected or limited to authorized hosts.
+ /phpMyAdmin/README: phpMyAdmin is for managing MySQL databases, and should
be protected or limited to authorized hosts. See: https://typo3.org/
+ /#wp-config.php#: #wp-config.php# file found. This file contains the creden
tials.
+ 8910 requests: 0 error(s) and 27 item(s) reported on remote host
+ End Time: 2025-04-09 21:25:39 (GMT-4) (13 seconds)

+ 1 host(s) tested

```

Figure 6 - Nikto of Metasploitable2 finished

```

(kali@kali)-[~]
$ nikto -h 192.168.10.14
- Nikto v2.5.0

Note: For a successful detection of this flaw the scanner host needs to be able to directly
connect to the scanned host.

+ Target IP: 192.168.10.14
+ Target Hostname: 192.168.10.14
+ Target Port: 80
+ Start Time: 2025-04-09 21:25:48 (GMT-4)

+ Server: Apache
+ /: The X-Content-Type-Options header is not set. This could allow the user
agent to render the content of the site in a different fashion to the MIME ty
pe. See: https://www.netsparker.com/web-vulnerability-scanner/vulnerabilities
/missing-content-type-header/
+ /BU7Sirev.cobalt: Retrieved x-powered-by header: PHP/5.5.29.
+ No CGI Directories found (use '-C all' to force check all possible dirs)
+ /index: Uncommon header 'tcn' found, with contents: list.
+ /index: Apache mod_negotiation is enabled with MultiViews, which allows att
ackers to easily brute force file names. The following alternatives for 'inde
x' were found: index.html, index.php. See: http://www.wisec.it/sectou.php?id=
4698ebdc59d15,https://exchange.xforce.ibmcloud.com/vulnerabilities/8275
+ /admin/: This might be interesting.
+ /readme: This might be interesting.
+ /image/: Drupal link header found with value: <http://192.168.10.14/?p=23>; rel=shortlink. See: https://www.drupal
+ /wp-links-opml.php: This WordPress script reveals the installed version.
+ /license.txt: License file found may identify site software.
+ /admin/index.html: Admin login page/section found.
+ /wp-login/: Cookie wordpress_test_cookie created without the httponly flag. See: https://developer.mozilla.org/en-
+ /wp-login/: Admin login page/section found.
+ /wordpress/: A Wordpress installation was found.
+ /wp-admin/wp-login.php: Wordpress login found.
+ /wordpress/wp-admin/wp-login.php: Wordpress login found.
+ /blog/wp-login.php: Wordpress login found.
+ /wp-login.php: Wordpress login found.
+ /wordpress/wp-login.php: Wordpress login found.
+ /#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ 8102 requests: 0 error(s) and 19 item(s) reported on remote host
+ End Time: 2025-04-09 21:27:33 (GMT-4) (105 seconds)

+ 1 host(s) tested

```

Figure 7 - Nikto of Mr. Robot

Nikto Findings Summary: Through the use of the tool Nikto, it showed the present web server vulnerabilities in targeted systems. Of the systems, only Metasploitable2 and Mr. Robot had vulnerabilities. For Metasploitable2, the virtual machine had many vulnerabilities, such as an outdated Apache version, PHP admin login pages, enabled directory browsing, and enabled TRACE methods. As for Mr. Robot, it confirms that it is a wordpress site, it has multiple login pages available including admin login pages, and a WordPress config file which will contain credentials. Utilizing figures 5-7 one can find the full Nikto scans of both Metasploitable2 and Mr. Robot.

Assessment Results – WPScan

```

(kali㉿kali)-[~]
$ wpscan --url http://192.168.10.14

WordPress Security Scanner by the WPScan Team
Version 3.8.28
Sponsored by Automattic - https://automattic.com/
@_WPScan_, @ethicalhack3r, @erwan_lr, @firefart

Quality of Detection: remote_vul (99%)

[+] URL: http://192.168.10.14/ [192.168.10.14]
[+] Started: Wed Apr  9 21:34:41 2025

Interesting Finding(s):
[+] Headers
| Interesting Entries:
| - Server: Apache
| - X-Mod-Pagespeed: 1.9.32.3-4523
| Found By: Headers (Passive Detection)
| Confidence: 100%

[+] robots.txt found: http://192.168.10.14/robots.txt
| Found By: Robots Txt (Aggressive Detection)
| Confidence: 100%

[+] XML-RPC seems to be enabled: http://192.168.10.14/xmlrpc.php
| Found By: Direct Access (Aggressive Detection)
| Confidence: 100%
| References:
| - http://codex.wordpress.org/XML-RPC_Pingback_API
| - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_ghost_scanner/
| - https://www.rapid7.com/db/modules/auxiliary/dos/http/wordpress_xmlrpc_dos/
| - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_xmlrpc_login/
| - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_pingback_access/

[+] The external WP-Cron seems to be enabled: http://192.168.10.14/wp-cron.php
| Found By: Direct Access (Aggressive Detection)
| Confidence: 60%
| References:
| - https://www.iplocation.net/defend-wordpress-from-ddos
| - https://github.com/wpscanteam/wpscan/issues/1299

```

Figure 8- WPScan of Mr. Robot pt1

```

[+] WordPress version 4.3.1 identified (Insecure, released on 2015-09-15).
| Found By: Emoji Settings (Passive Detection) MB request and checks if the target is
| - http://192.168.10.14/de03258.html, Match: 'wp-includes\js\wp-emoji-release.min.js?ver=4.3.1'
| Confirmed By: Meta Generator (Passive Detection)
| - http://192.168.10.14/de03258.html, Match: 'WordPress 4.3.1'
| Note: For a successful detection of this flaw the scanner host needs to be able to directly
[+] WordPress theme in use: twentyfifteen
| Location: http://192.168.10.14/wp-content/themes/twentyfifteen/
| Last Updated: 2024-11-12T00:00:00.000Z Detection: remote: vul (99%)
| Readme: http://192.168.10.14/wp-content/themes/twentyfifteen/readme.txt
| [!] The version is out of date, the latest version is 3.9
| Style URL: http://192.168.10.14/wp-content/themes/twentyfifteen/style.css?ver=4.3.1
| Style Name: Twenty Fifteen
| Style URI: https://wordpress.org/themes/twentyfifteen/1.3.0.25rc3
| Description: Our 2015 default theme is clean, blog-focused, and designed for clarity. Twenty Fifteen's simple,
| Author: the WordPress team
| Author URI: https://wordpress.org/
| Impact
| Found By: Css Style In 404 Page (Passive Detection) this issue to execute arbitrary shell
| commands on an affected system with the privileges of the application.
| Version: 1.3 (80% confidence)
| Found By: Style (Passive Detection)
| - http://192.168.10.14/wp-content/themes/twentyfifteen/style.css?ver=4.3.1, Match: 'Version: 1.3'
[+] Enumerating All Plugins (via Passive Methods) Vendorfix
[i] No plugins Found. Updates are available. Please see the referenced vendor
advisory.
[+] Enumerating Config Backups (via Passive and Aggressive Methods)
Checking Config Backups - Time: 00:00:00 ←
[i] No Config Backups Found. Gain a shell remotely
[!] No WPScan API Token given, as a result vulnerability data has not been output.
[!] You can get a free API token with 25 daily requests by registering at https://wpscan.com/register

[+] Finished: Wed Apr 9 21:34:44 2025
[+] Requests Done: 173 CVE CVE-2007-2447
[+] Cached Requests: 6
[+] Data Sent: 42.688 KB
[+] Data Received: 267.468 KB Other https://www.samba.org/samba/security/CVE-2007-2447.html
[+] Memory used: 270.625 MB https://web.archive.org/web/20210121173708/http://www.securityfocus.com
[+] Elapsed time: 00:00:03

```

Figure 9 - WPScan of Mr. Robot pt2

WPScan Findings Summary: WordPress was not present on either Metasploitable2 or Ubuntu Server virtual machines. However, it was found on Mr. Robot which revealed some critical information. Most notably was that WordPress is out of date, which is vulnerable and needs patched. Secondly, robots.txt is available, allowing attackers to find hidden files and directories. Lastly, it was not able to find plugins, however if it did it would find multiple vulnerable plugins like OpenVAS finds. Figures 8 and 9 show the full WPScan of Mr. Robot.

Remediation Recommendations Table

Item	System/ IP	CVE/Vulnerability	Solution/ Remediation	Budget = HxR+M
1	Mr. Robot/ 192.168.10.14	CVE-2020-35489/ WordPress Contact Form 7 Plugin < 5.3.2 RCE Vulnerability	Update WordPress Contact Form 7 plugin to version 5.3.2 or later.	1x50+0 = \$50 budget
2	Mr. Robot/ 192.168.10.14	CVE-2023-2996/ WordPress JetPack Plugin Arbitrary File Manipulation Vulnerability	Update the WordPress Jetpack plugin with the new version at: https://jetpack.com/resources/jetpack-12-1-1-critical-security-update/	1x50+0 = \$50 budget
3	Mr. Robot/ 192.168.10.14	CVE-2022-3416 & 3417/ WordPress Wptouch Plugin < 4.3.45 Multiple Vulnerabilities	Update WordPress Wptouch plugin to version 4.3.45 or later.	1x50+0 = \$50 budget
4	Mr. Robot/ 192.168.10.14	CVE-2021-24307/ WordPress All in One SEO Pack Plugin < 4.1.0.2 RCE Vulnerability	Update WordPress All in One SEO Pack plugin to version 4.1.0.2 or later.	1x50+0 = \$50 budget
5	Metasploitable2/ 192.168.10.13	CVE-2008-5304 & 5305/ TWiki XSS and Command Execution Vulnerabilities	Upgrade TWiki to version 4.2.4 or later.	3x50+0 = \$150 budget
6	Metasploitable2/ 192.168.10.13	CVE-1998-0618/ The rexec service is running	Disable the rexec service. As an alternative use SSH instead.	2x50+0 = \$100 budget
7	Metasploitable2/ 192.168.10.13	CVE-2012-1823 & 2311 & 2336 & 2335 /PHP < 5.3.13, 5.4.x < 5.4.3 Multiple Vulnerabilities - Active Check	Update PHP to version 5.3.13, 5.4.3 or later.	2x50+0 = \$100 budget
8	Metasploitable2/ 192.168.10.13	CVE-2001-0645/ MySQL / MariaDB Default Credentials (MySQL Protocol)	Change the MySQL/ Maria DB password to a secure password.	1x50+0 = \$50 budget
9	Ubuntu Server/ 192.168.10.12	CVE-1999-0524/ ICMP Timestamp Reply Information Disclosure	1. Disable the support for ICMP timestamp on the remote host. 2. Protect the remote host with a firewall, and block ICMP packets passing through the firewall from either direction.	1x50+0 = \$100 budget
				Total: \$700

Remediation Recommendations Information

The solution or remediation for each CVE was provided through the aid of NIST's National Vulnerability Database and OpenVAS's NVT. Through comparing and contrasting given solutions (most were the same) a final solution was developed to be implemented into the remediation process and was given a budget. The budget for each item was calculated by multiplying hours worked (H) by a rate (R) in USD. This calculation was then added with the cost of materials (M), creating the final equation $(H \times R) + M$. Using this equation the budget was determined for each item. Since most of the vulnerabilities were simple fixes such as patches/updates, disabling services, or changing passwords, the total budget of all nine items was \$700 to remediate.

Conclusion

This virtual network environment held 2 highly vulnerable machines on it in addition to 2 other machines. Of those machines Metasploitable 2 and Mr. Robot have severe vulnerabilities that need remediated immediately to become secure. This was determined through the use of four tools, OpenVAS, Nmap, Nikto, and WPScan which have all come to similar conclusions. Through utilizing OpenVAS's CVE matching against targeted systems it has found 61 medium to high vulnerabilities on the Metasploitable2 machine, and 15 medium to high vulnerabilities on the Mr. Robot system (most WordPress related). Of the most four most severe vulnerabilities on each system it will cost upwards of \$600 to remediate in total. These findings highlight the need for remediation efforts and demonstrate the importance of vulnerability assessments to maintain secure network environments.