Lab 3 – Navigating

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Introduction

Virtual Machines are powerful tools for anybody who works on computer. Whether you are configuring a test environment or mimicking a specific environment to test a day zero exploit. Part of creating a environment is being able to navigate your environment effectively. This lab explores how to navigate PowerShell and the Linux terminal.

Breakpoint 1

Since this was not my first time with Linux, I was able to boot it up with ease. To boot but my terminal in Linux, I went to the bottom task bar and clicked the black box with white text in it. I know this is the terminal since I dual boot Red Hat on my main desktop when I am practicing for my Linux+ certification. For Windows PowerShell, I kinda assumed it was command prompt (CMD) so I originally opened CMD and then started working on the next breakpoint, as evident by what it is my Linux terminal. Realizing this, I clicked my windows key and then searched up PowerShell and then right clicked on it to launch it as an administrator. This is important for a future break point, how I launched PowerShell.

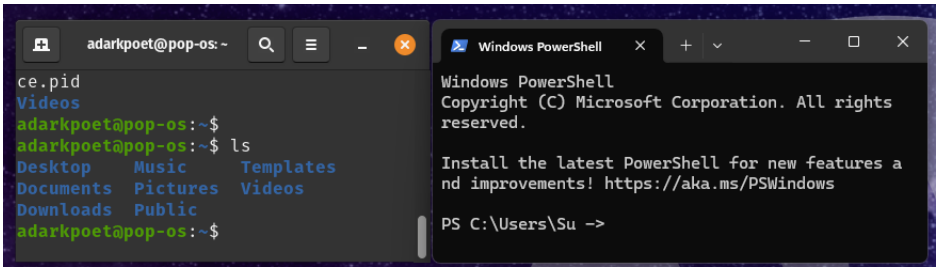

Figure 1 Linux Terminal and Windows PowerShell

Breakpoint 2

So comparing my GUI file explore and the terminal, I noticed that it is a 1-to-1 match in terms of the files that are in the terminal. The actual screenshot for this is in breakpoint 4 where I show the ls -a command that I ran for that breakpoint.

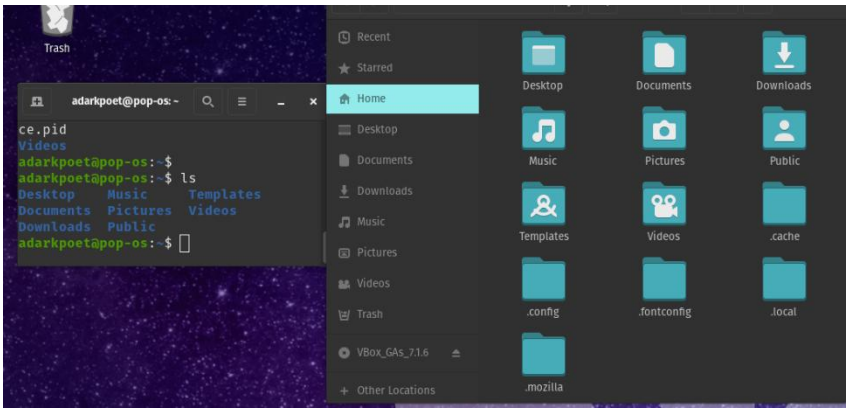

Figure 2 Linux Terminal and Linux File Explorer

BREAKPOINT 3

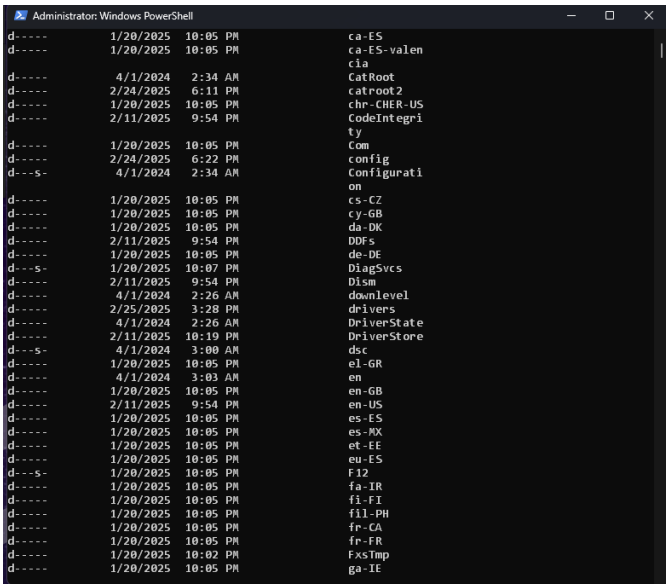

Figure 3 ls -a for command for /System_32

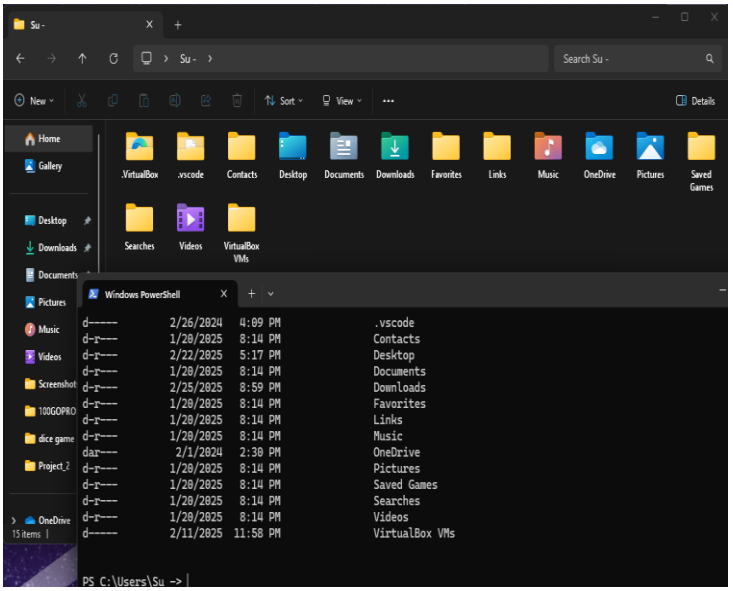

Figure 4 ls -a command for /Su -

So in breakpoint 1 I mention, per the assignments instructions, I ran the Windows PowerShell as an administrator. What ends up happening with that is the PowerShell puts you in \System_32 (root) instead of just the user. So when I ran the ls -a equivalent in PowerShell, it showed every file in my entire computer. Which resulted in me immediately restarting the terminal in \Su - so I could complete the assignment-but it was amusing to realize my mistake as I watched PowerShell list every file. I listed my directories in PowerShell and it was a 1-to-1 match for what was in the command line and in my file explorer. So, I do not have a dedicated file for the class. I just use my download folder since its all assignments that I submit and done and never see again. So the full path name for my downloads folder is C:\Users\Su -\Downloads

BREAKPOINT 4

A

Figure 5 ls -a command in Linux terminal

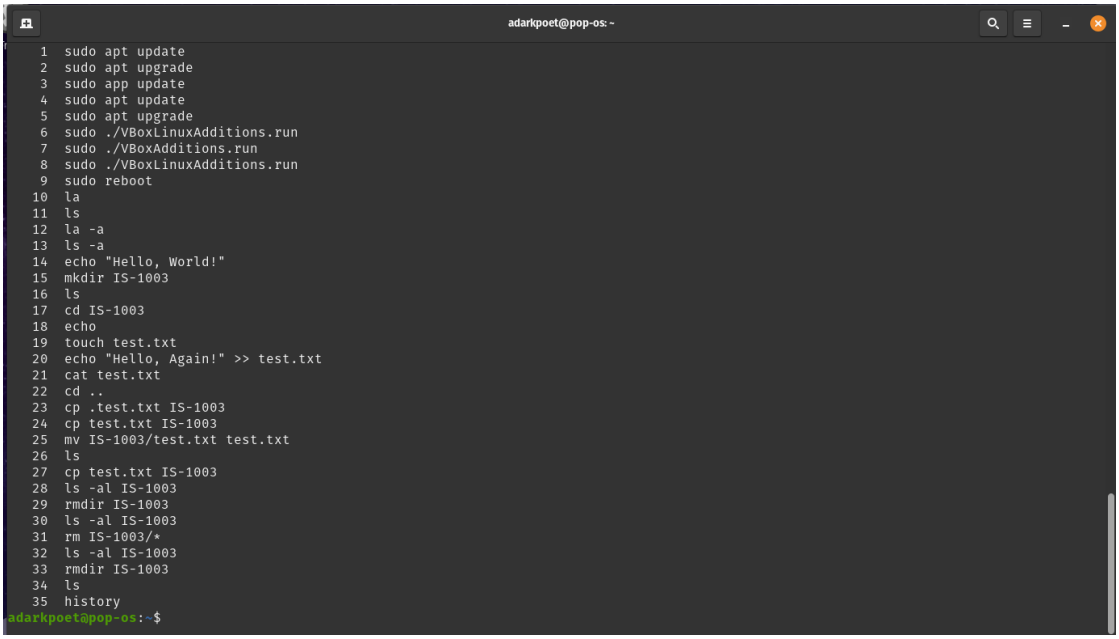

Figure 6 Linux Command history

I didn't read to screenshot all commands entered (I do it for breakpoint 5) I will go through my command history and go through the commands and what they do.

The commands 10-13 (ls and ls -a) display directories and then when you add -a it shows all hidden and not readily accessible files. Kinda like the all seeing eye for user.

Line 14 is just testing the "echo" command. What that does is tell the terminal to print a string of text, same and what user input, and it copies exactly what the user put.

Line 15 and 16 is creating a new directory (mkdir) called IS – 1003 which will allow me to put files in it and interact with by calling/navigating to the directory. The ls is to verify that the directory was actually there.

Line 19 to 20 all deal with the text.txt file. The touch command creates a file of the users choice and puts it in the directory that the user is in. I ended up using the echo command to copy text "Hello, Again" to the newly created text file.

Line 21 is simply calling the file and the result was printing the "Hello, Again!" into the terminal. text we echoed into it in steps 19 and 20.

Line 22 returns the user back to the home directory of the computer, that case for me was adarkpoet@pop-os.

Line 23 through 28 moving the text.txt file to the IS-1003 directory, via copying it, as we set up to delete the directory.

Lines 29 to 34 is deleting the directory. Since the directory has active files in it, we had to use the "rm IS-1003/* command as that command deletes directories with a specific number of bytes equal to that directory and as a result deletes IS-1003 directory.

BREAKPOINT 5

Much like breakpoint 4, we are doing the same thing but just running the commands in a different environment with some minor tweaks to the commands themselves. To start, figure 7, I needed to create a new directory to mess around with. PowerShell is a lot easier to work with as it used more English commands, in terms of how they are written, as you can clearly see that I create a new item, name it "IS-1003" and then designate it as a directory.

Figure 8 we are also creating a new item, but this time it is just a text file where I will "echo" text to and manipulate the file and the location.

Figure 9 we are building off of 8 and writing text to the new test.txt file. We are doing this by writing "Write-Output" which is similar to "echo" in Linux. The I call the file by doing "Get-Content" and the text.txt.

Figure 10 shows what happens when I run the Get-ChildItem -Directory -Force. It shows all the directories on my computer.

Figure 11 shows all the PowerShell history like we did in Breakpoint 4 for Linux.

```
PS C:\Users\Su -> New-Item -Name "IS-1003" -ItemType Directory


    Directory: C:\Users\Su -


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----         2/25/2025   9:29 PM                IS-1003
```

Figure 7 Creating New Directory

```
PS C:\Users\Su -\IS-1003> New-Item "test.txt"


    Directory: C:\Users\Su -\IS-1003


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         2/25/2025   9:30 PM              0 test.txt
```

Figure 8 Creating New Text File

```
PS C:\Users\Su -\IS-1003> Write-Output "Hello, Again!" >> test.txt
PS C:\Users\Su -\IS-1003> Get-Content test.txt
Hello, Again!
```

Figure 9 Writing a string to new file created

```
Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----         2/25/2025   8:53 PM                .VirtualBox
d-----         2/26/2024   4:09 PM                .vscode
d-r---         1/20/2025   8:14 PM                Contacts
d-r---         2/22/2025   5:17 PM                Desktop
d-r---         1/20/2025   8:14 PM                Documents
d-r---         2/25/2025   8:59 PM                Downloads
d-r---         1/20/2025   8:14 PM                Favorites
d-r---         1/20/2025   8:14 PM                Links
d-r---         1/20/2025   8:14 PM                Music
dar---          2/1/2024   2:30 PM                OneDrive
d-r---         1/20/2025   8:14 PM                Pictures
d-r---         1/20/2025   8:14 PM                Saved Games
d-r---         1/20/2025   8:14 PM                Searches
d-r---         1/20/2025   8:14 PM                Videos
d-----         2/11/2025  11:58 PM                VirtualBox VMs
```

Figure 10 This shows what directories that are on my main computer via the PowerShell

```
  1 pwd
  2 Get-Location
  3 date
  4 Get-Date
  5 dir
  6 Get-ChildItem
  7 Get-ChildItem -Directory -Force
  8 clear
  9 Write-Host "Hello, World!"
 10 clear
 11 Get-History
 12 New-Item -Name "IS-1003" -ItemType Directory
 13 Set-Location
 14 Set-Location IS-1003
 15 New-Item "test.txt"
 16 Write-Output "Hello, Again!" >> test.txt
 17 Get-Content test.txt
 18 Get-Histoty
 19 Get-Histoty
 20 Get-History
 21 Set-Location -Path ..
 22 Move-Item .\IS-1003\test.txt .\test.txt
 23 Remove-Item IS-1003
 24 ls
 25 Remove-Item test.txt
 26 /ls
 27 ls
```

Figure 11 PowerShell command history

CONCLUSION

Closing out this lab, I still maintain my idea that the Linux terminal commands to do things are very memory heavy. What I mean by that is you have to memorize the commands necessary to navigate a Linux Operating System. Windows PowerShell seems more intuitive as all the commands you input is more English and common sense then what they are in Linux. With that said, Linux one of the biggest and more secure OS used in the cybersecurity field, so no matter how much I dislike the unnatural nature of the commands, I will need to learn them to use the command prompt in the Linux Operating

System. So that is what I will be looking into after completing this assignment is ways to memorize the Linux terminal commands for better efficiency when I do use it in the future.

REFERENCES

R. Mitra, "*Lab 3: Navigating*," The University of Texas at San Antonio (2024). Last accessed: *Feb 25, 2025*.

COLLABORATION

I worked alone.