Lab Assignment

Cybersecurity and Digital Forensics Academy

"Linux File Navigation, User Management, and Bash Scripting"

1. Purpose of the Lab Assignment: The purpose of the lab is to enable us practice the use of Linux commands to enable us master how to navigate through files, manage users and also practice Bash Scripting.

2. The Structure of the Lab. The Lab report is presented in the following sub headings in order to give it a professional and structured outlook.

2.1. Title Page

Lab Title: Linux File Navigation, User Management, and Bash Scripting

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”6÷W'6R æ ÖS WASF101 Introduction to Web Application Security

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2.2 Executive Summary

This lab assignment has enabled me use different commands ranging from creating files and folders and also changing and assigning users and groups to files and directories. I have learnt and fully understand the concepts of user management and

practical implementation of Bash commands.

2.3 Lab Objectives

The objective to the lab is to enable us make use of our already installed VMware, Virtual Box and Kali Linux installations and setups to successfully run and implement Linux file navigation and manage file and folders users and groups and also practical text and run Bash Scripting commands. It has been a very good starting point that demonstrate the academy's commitment to giving us the very best orientation and starting point towards making use ready and having a working and functional VMware to implement numerous tasks ahead.

2.4 Tools and Resources Used

The tools and resources for this laboratory work are the VMware and Linux commands to effectively demonstrate and implement the content and concepts in the title of the lab: "Linux File Navigation, User Management, and Bash Scripting". The VMware with a Linux file enabled me to successfully run the commands and achieve the purpose and aim of the practical lab class. The practical lab has been a good starting point for me and my intention to learn and master Linux as the scripting language for cybersecurity and digital forensic. I am glad to have learnt how to installed and use the VMware and achieve a required learning and practical steps need to successfully demonstrate and implement file navigation, user management and Bash Scripting.

2.5 Methodology

The methodology for this lab assignment hinges on the downloading and subsequent installation of VMware software and then the downloading of the Kali Linux for VMware file and having it open and made running to be able to have a virtual machine to run Linux and do the lab assignment successfully. It has been a successful implementation of the concepts learnt in the lecture notes through a meticulous implementation of the concepts and principles learnt. The VMware has been installed and enabled to run the codes to navigate files, change and assigned users and groups, and practice the Bash Scripting.

2.6 Screen Shoots and Evidence

Part 1: File Navigation

1. Create a new directory called assignment in your home directory.

mkdir assignment

2. Create the following subdirectories within the assignment directory:

cd assignment

mkdir docs

mkdir images

mkdir scripts

i. docs

ii. images

iii. scripts

3. Navigate to the docs directory and create three new files:

cd docs

touch report1.txt

touch report2.txt

touch report3.txt

i report1.txt

ii report2.txt

iii report3.txt

4. Navigate to the images directory and create two new files:

cd images

touch image1.jpg

touch image2.png

i image1.jpg

ii image2.png

5. Navigate to the scripts directory and create one new file: %Ë script1.sh

cd scripts

touch script1.sh

6. List the contents of the assignment directory, including all subdirectories and files.

7. Navigate to the docs directory and list the contents

8. Move the report2.txt file from docs to the images directory.

9. Copy the image1.jpg file from images to the docs directory.

10. Delete the report3.txt file from docs.

11. Create a new file called your-name in the assignment directory.

12. Navigate to the scripts directory and make script1.sh delete the your-name file.

13. Copy the assignment directory from Desktop to Downloads.

14. 14. Remove the assignment directory in the Downloads.

15. Navigate to / and list the contents of the directory.

Part 2: Questions

1. What is the purpose of the pwd command?

The pwd command allows you to see the current working directory for easy reference and access at any time for the performance of any relevant tasks that require relative path or absolute path.

2. What is the difference between the cd .. and cd ../.. commands?

The cd .. move to the previous directory. That is one directory back in the path of the directory.

The cd ../.. takes you two directories back.

3. What is the purpose of the ls command?

The ls command allows you to view the available directories and files in directory or file.

4. What is the base of a Linux system?

The base of Linux system is the Linux Kernel which is the component responsible for hardware management and management of processes, memory, and system resources. It also handles Handles process scheduling, memory management, and device drivers. It has a SHELL (Command Line Interface - CLI) that allows interaction with the system using commands (Bash, Zsh and Fish).

User Management:

1. Create the following new users with the specified passwords and log in to john and jane:

User: john, Password: john123

User: jane, Password: jane123

User: bob, Password: bob123

User: alice, Password: alice123

User: mike, Password: mike123

Switching to john and jane

2. Delete the following users:

Bob

alice

Deleting Alice

Deleting John

Deleting bob

2. Create a new user admin with the username admin and password admin123, and add them to the group wheel.

4. Change the password of the user john to newjohnpassword.

5. Lock the user account jane and then unlock it.

Group Management:

1. Create the following new groups:

marketing

sales

IT

HR

finance

Verifying whether the groups have been created

2. Add users to each group as follows:

marketing: john, jane

sales: mike, jane

IT: admin

HR: admin

finance: mike, admin

3. Remove jane from marketing and sales.

4. Delete the HR and finance groups.

Permission Management:

Create a new directory projects with the permission drwxr-xr-x (octal method).

sudo mkdir projects

sudo chmod 755 projects

Change the permission of the projects directory to drwxrwx--- (symbolic method).

sudo chmod u+rwx,g+rwx,o-rwx projects

3. Create files with specific permissions:

report.txt with rw-r--r—

salesdata.csv with rwxr-xr-x

marketingplan.docx with rw-rw-r--

4. Change file ownership:

5. Create a new directory archives with the permission drwxr-xr-x (symbolic method).

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Part 4: Package Management

Perform the following package management tasks on Kali Linux:

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1. Updating Package Lists:

Run: sudo apt update

Explain the purpose of this command.

The purpose of this command is to update the Kali Linux App using the apt package.

2. Installing Packages:

Install curl using sudo apt install curl.

Verify installation using curl --version. •

3. Upgrading Packages:

Upgrade all installed packages using sudo apt upgrade.

4. Removing Packages:

Remove curl using sudo apt remove curl.

Verify removal.

5. Searching for Packages:

Search for networking-related packages using apt search networking.

List some networking tools available for installation.

Part 5: Bash Scripting Objective: To develop practical skills in bash scripting, problem-solving, and automation.

1 . Explain types of variables and give examples

We have the following types of variables in bash scripting:

Local Variables: This are variables defined by users and exist only in the script or session.

Environmental variables: These are system variables that are made accessible to all processes.

Special Variables: Predefined variables like $0, $#, $?.

Read-Only Variables: These are variables that cannot be changed after assignment.

Unset Variables: These are variables that are removed using unset.

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#!/bin/bash

# Declare and use simple variables
name="John"
age=25
echo "My name is $name and I am $age years old."

# Export a variable and use it
export CITY="New York"
echo "I live in $CITY"

# Print all environment variables
printenv | grep CITY  # Filtering just the CITY variable

# Display script name and arguments
echo "Script name: $0"
echo "First argument: $1"
```

```
echo "Number of arguments: $#"


# Read-only variable

readonly PI=3.14159

echo "Pi value: $PI"


# Unset a variable and check if it's cleared

var="Hello"•

unset var

echo "Var after unset: ${var:-Variable is unset}"  # Using default value if unset
```

2. Write a script that asks the user for their name, age, and favorite color, then prints a message with this information.

Write a script with an if-else statement that checks if a file exists, and prints its size if it does, or a message if it doesn't.

4. Write an interactive script that: %Ë Prompts the user for a file name and creates the file. %Ë Prompts the user for the file permission and assigns it. %Ë Prompts the user for the owner and assigns ownership. %Ë Displays the created file, permissions, and ownership details.

2.7 Analysis and Findings

The practical lab has exposed me to practically create folders, files, delete, and move them or copy them around easily. I have discovered how to assignment users and associate privileges to files and folders and users and groups. The assigned users and groups have privileges that demonstrate their level of access and things they can perform on the files and their limits based on the associated privileges and restrictions. This knowledge is definitely a great turning point to my learning ability and the exposure required to determine and know the level to what each user and groups have and what privileges they are given or not in relation to a file or folder.

2.8 Challenges and Solutions

The work has been quite challenging, as the first video appears, it look like I have learnt something very difficult despite my computing background. It video appeared not to have proper introduction but just began by assigning user permissions and groups and later moving to privileges, I got confused. I just took my time to watch the video again and again and then every fell in place and easily master the concepts and begin to feel at home. Things become much easier when I finally have the VMware up and running. Though even that came with a lot of stress. I even the pdf installation guide and followed it religiously and all steps were successful until when I came to open the VMware file I downloaded after installing the VMware installations. When I clicked open VM option and couldn’t locate the downloaded folder, I couldn’t know why and with my experience I think I should figure it out. I said I am sure I have downloaded this file and why is it missing. I later discovered that I have not unzipped the downloaded file. From there unzipped it and open the file on the VMware and hence have my Kali Linux up and doing.

2.9 Conclusions

The practical lab has given me the necessary exposure and practical implementation of various Linux Commands and operations that have buttressed my understanding and commitment to learning and mastering the Linux principles and operations. I has been a great experience of creating folders, files and easily moving them around and assigning them to users and groups and also associating different privileges to them and demonstrating my understanding and usage of the Bash Scripting Commands. It has been a good experience worthy of repetition.

2.10 Recommendations

The following recommendation was derived from the lesson learnt during the exercises.

The usage of the Virtual Box has not been explained up to now please. It has also not included in I am able to download the VMware and Virtual Box but I am only using the VMware the setup guide. I recommend that an adjustment be made to the installation guide to explain and demonstrate the reason of downloading the Virtual Box and what and how it should be used.

2.11 References

Mr. Zakariyya (2025). Linux File Navigation, User Management, and Bash Scripting PDF. ICDFA.