CompTIA Linux+

Configure Permissions on Files and Directories

Introduction

Welcome to the **Configure Permissions on Files and Directories** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Permissions
Files
Directories

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Configure Permissions on Files and Directories

After completing this lab, you will be able to:

- Configure file permissions
- Change Permissions with Numbers
- Use commands to check permissions (chmod, chown, chgrp)

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 104.5 Manage file permissions and ownership
- **CompTIA:** 3.1 Given a scenario, apply or acquire the appropriate user and/or group permissions and ownership.

Note: *Our main focus is to cover the practical, hands-on aspects of the exam objectives. We recommend referring to course material or a search engine to research theoretical topics in more detail.*

Lab Duration

It will take approximately **1 hour** to complete this lab.

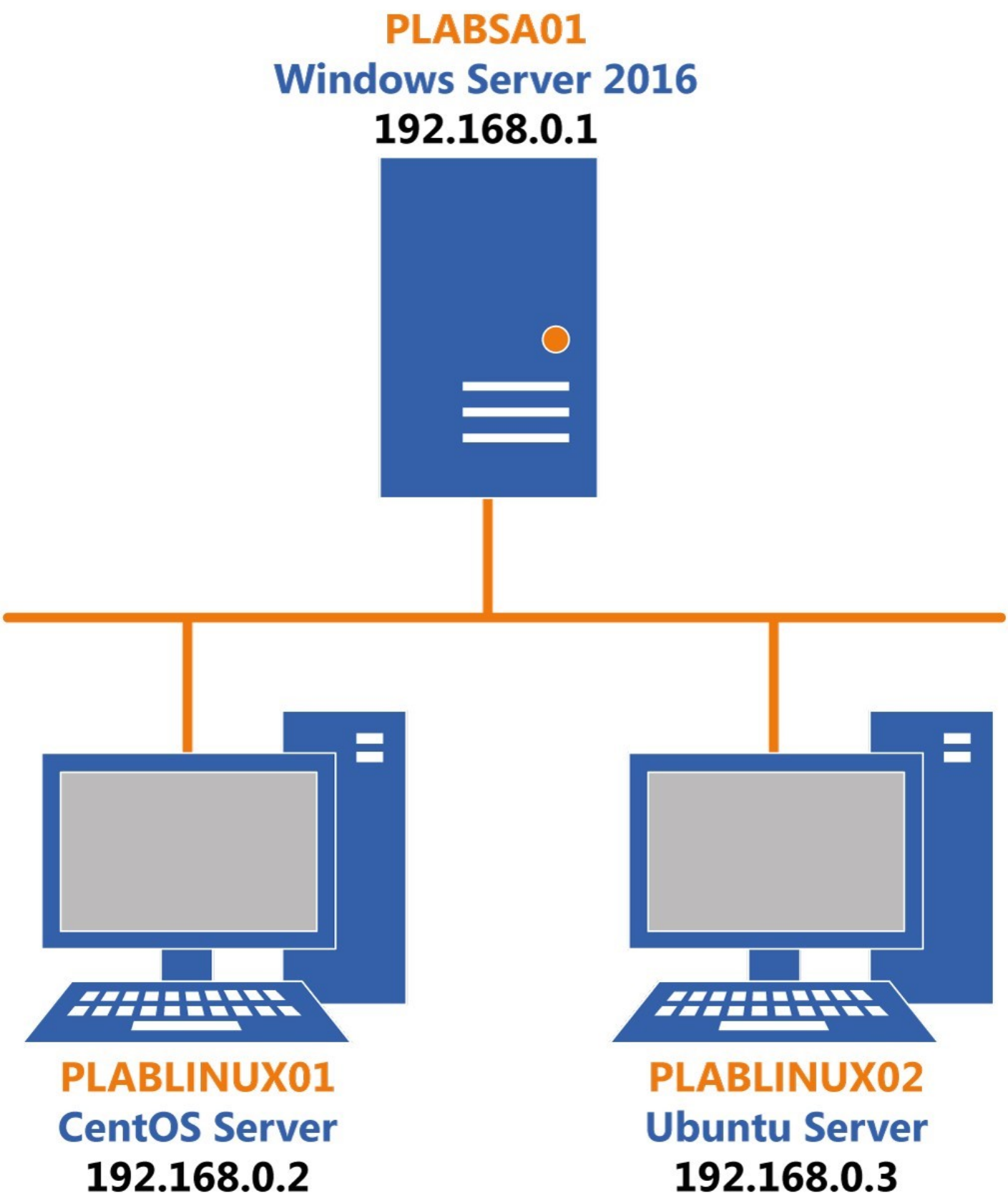
Help and Support

For more information on using Practice Labs, please see our **Help and Support** page. You can also raise a technical support ticket from this page.

Click Next to view the Lab topology used in this module.

Lab Topology

During your session, you will have access to the following lab configuration.



Depending on the exercises you may or may not use all of the devices, but they are shown here in the layout to get an overall understanding of the topology of the lab.

- **PLABSA01** (Windows Server 2016)
- **PLABLINUX01** (CentOS Server)
- **PLABLINUX02** (Ubuntu Server)

Click Next to proceed to the first exercise.

Exercise 1 - Configure Permissions on Files and Directories

Each file that is created on the Linux system needs to have some type of permission. For example, the owner always has the read and write permissions. However, the owner may choose to deny any kind of permission on the respective file.

In this exercise, you will understand how to manage file permissions and ownership.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Configure file permissions
- Change Permissions With Numbers
- Use commands to check permissions (chmod, chown, chgrp)

Your Devices

You will be using the following device in this lab. Please power these on now.

- **PLABLINUX02** (Ubuntu Server)

Task 1 - Configure File Permissions

You can use file permissions to enable users to access a file or a directory for selective operations. For example, some users might have read rights only while other users might have write permissions. Normally, the owner of the file has full rights - read,

write, and execute - on a file. In this task, you will learn to access and change the access permissions on regular and special files as well as directories.

To manage access permissions, perform the following steps:

Step 1

On the desktop, right-click and select **Open in Terminal**.

> ***Note:*** *You may find a few extra icons on the desktop. This is due to continuous changes in the device. These icons, however, do not alter the functionality of this module.*

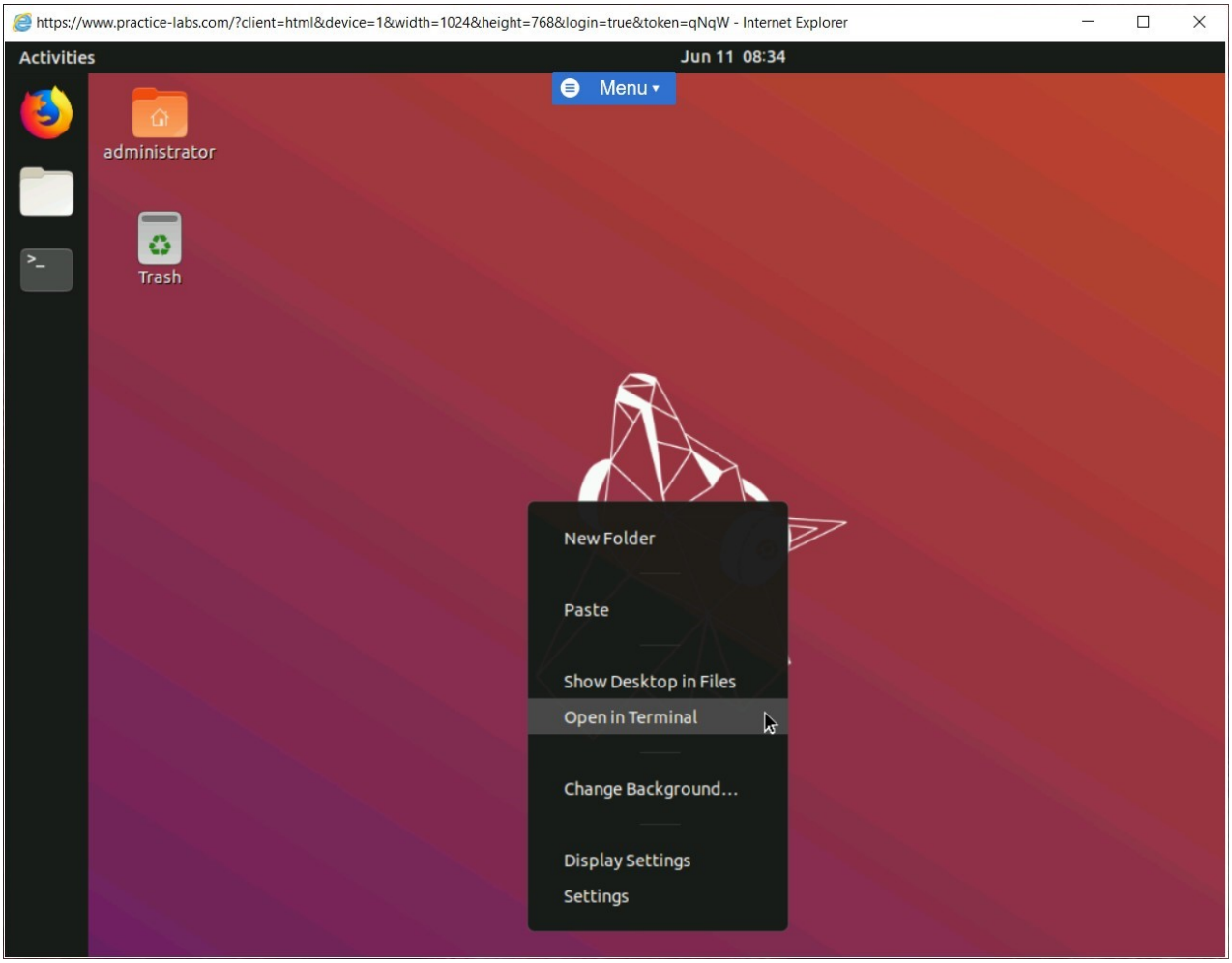


Figure 1.1 Screenshot of PLABLINUX02: Selecting the Open Terminal option from the context menu.

Step 2

The command prompt window is displayed.

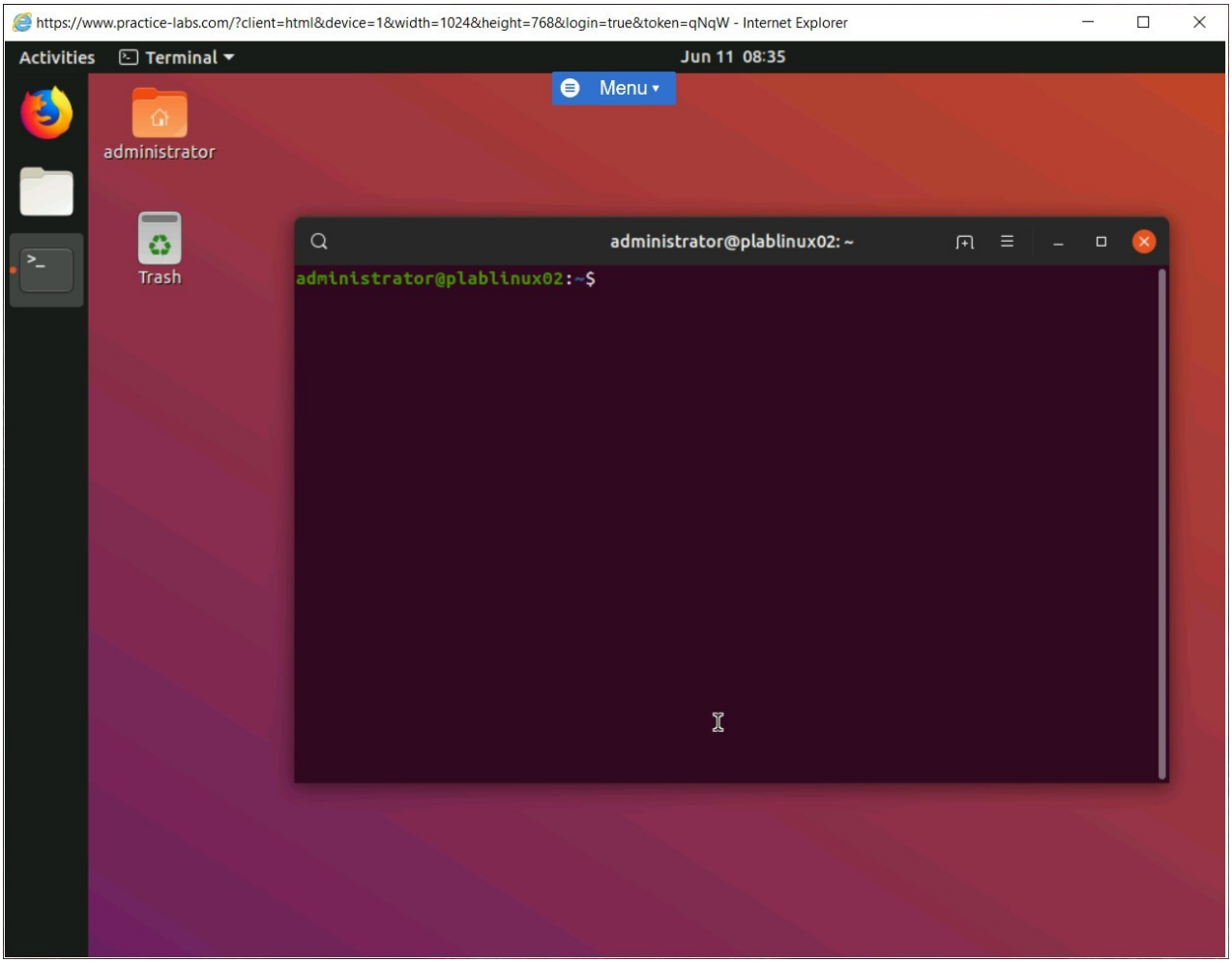


Figure 1.2 Screenshot of PLABLINUX02: Displaying the terminal window.

Step 3

To list the directories with the permissions, type the following command:

```
ls -l
```

Press **Enter**.

> ***Note**: The leftmost column lists the permissions on the directories listed, which is denoted with **d** as the first character. There are three types of groups: **d** for directories, **l** for Symbolic link, and **-** for a regular file.*
> *Permissions can be read=r, write=w and execute=x.*

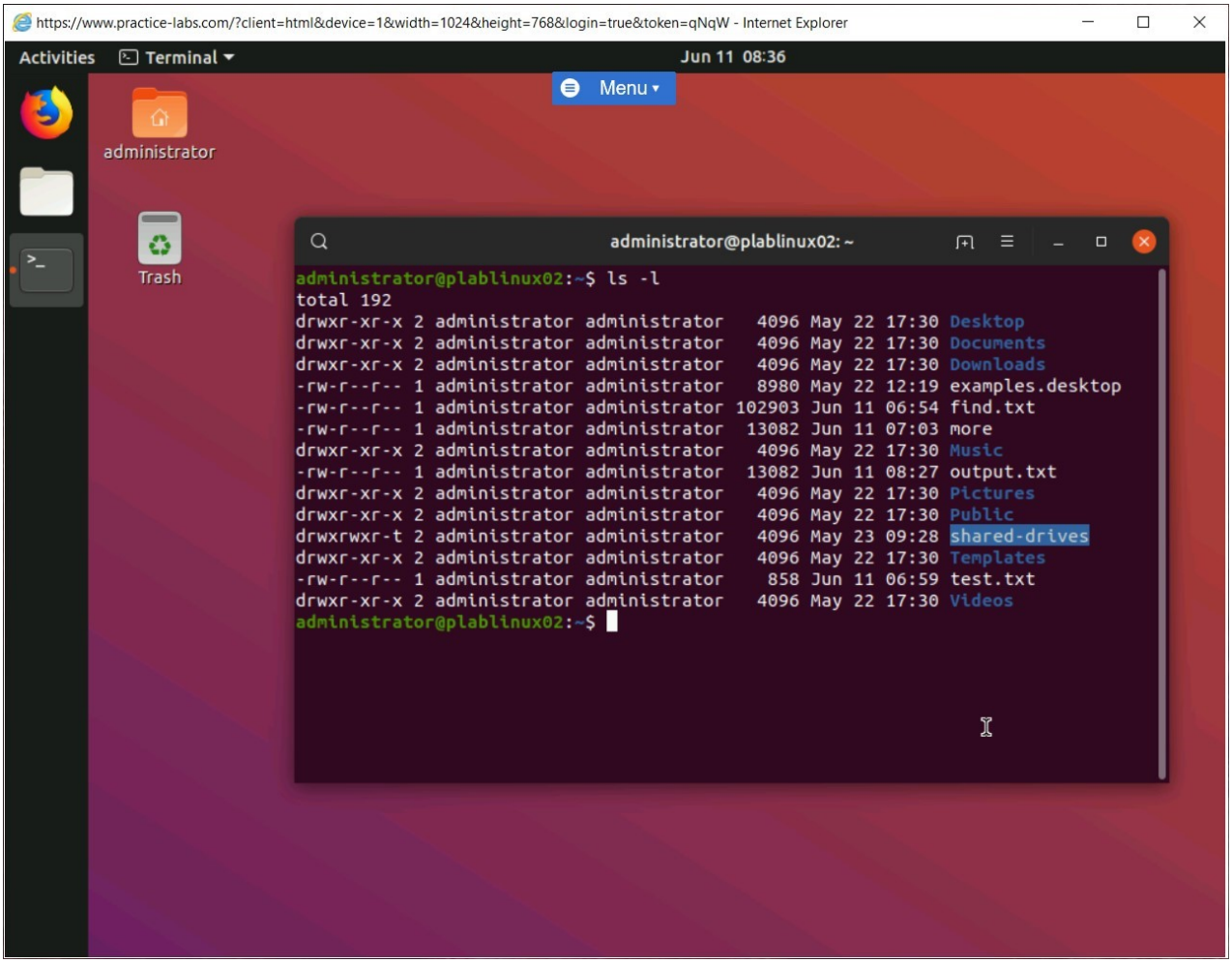


Figure 1.3 Screenshot of PLABLINUX02: Listing the directories with their permissions.

Step 4

Clear the screen by entering the following command:

```
clear
```

You will now create a new text file, **plab.txt**. Type the following command:

```
touch plab.txt
```

Press **Enter**.

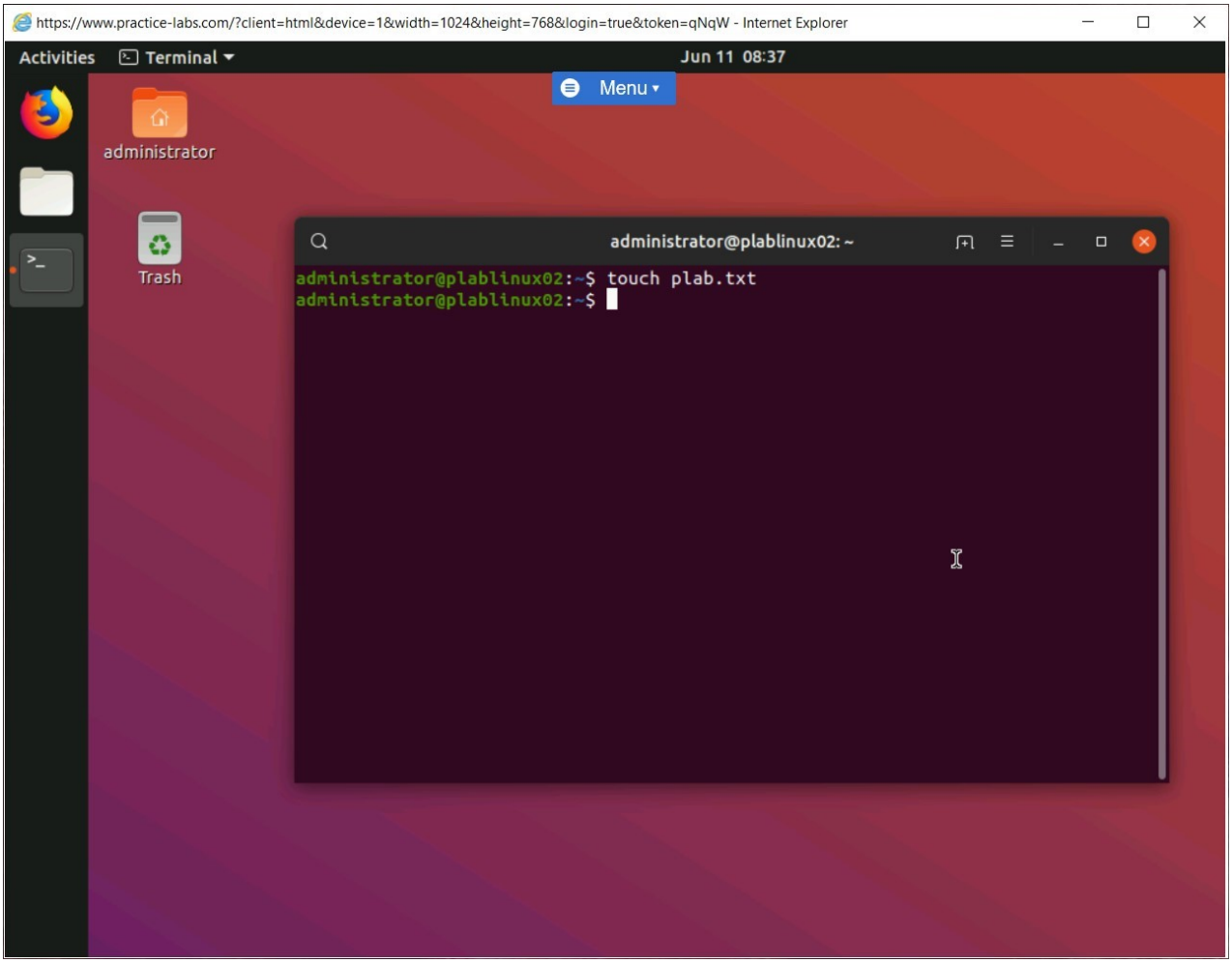


Figure 1.4 Screenshot of PLABLINUX02: Creating a new text file.

Step 5

Again, to list the directories and files with the permissions, type the following command:

```
ls -l
```

Press **Enter**.

Note that as the owner of this file user, you have read and write permissions on this file but not the execute permissions.

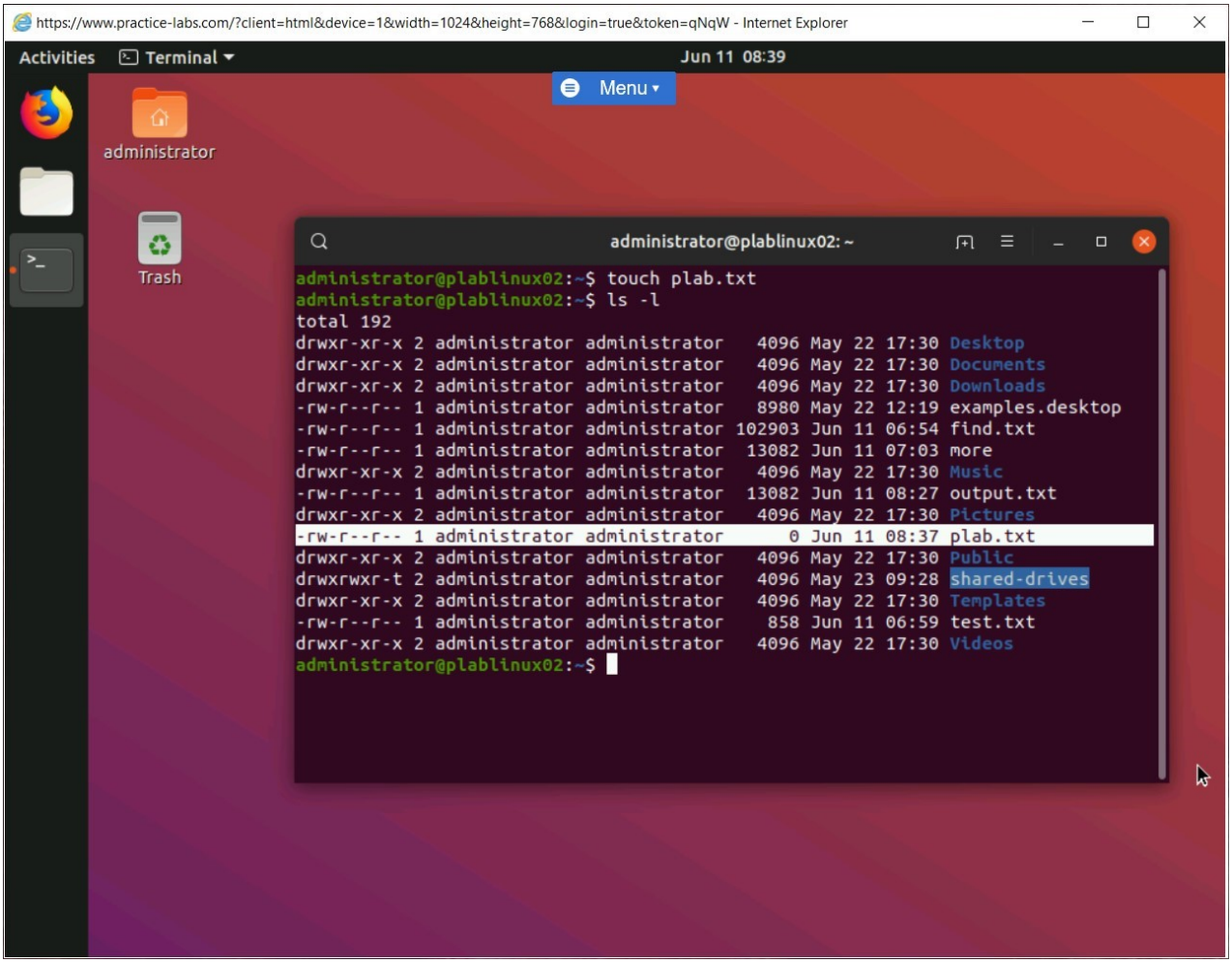


Figure 1.5 Screenshot of PLABLINUX02: Verifying the permissions of plab.txt.

Step 6

You can also add the execute bit to the file. Type the following command:

```
chmod u+x plab.txt
```

Press **Enter**.

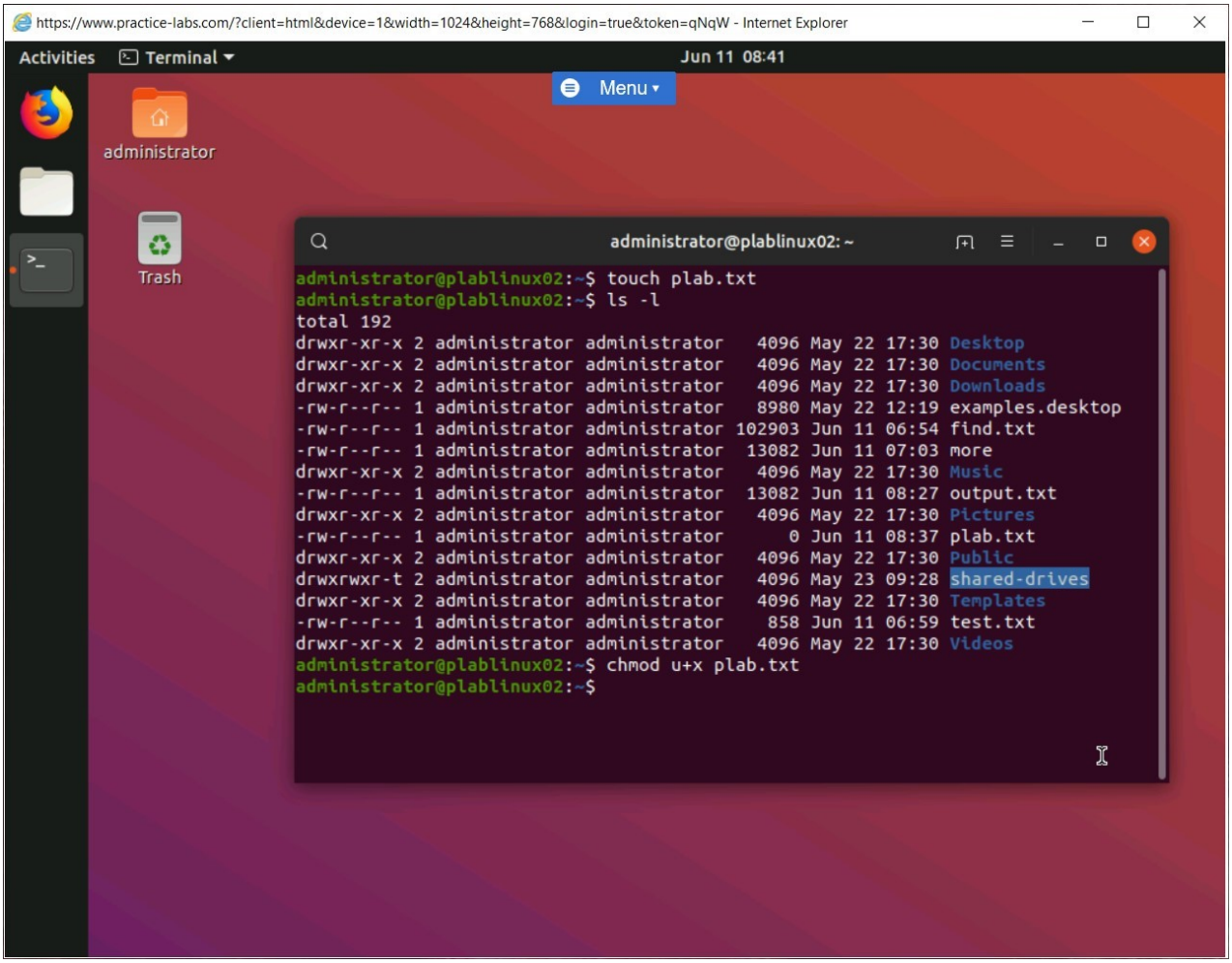


Figure 1.6 Screenshot of PLABLINUX02: Adding the execute bit to the plab.txt file.

Step 7

Clear the screen by entering the following command:

```
clear
```

You can also view the permissions for a specific file, which in this case is **plab.txt**. To do this, type the following command:

```
ls -l plab.txt
```

Press **Enter**.

Notice that the execute bit is now added to the file.

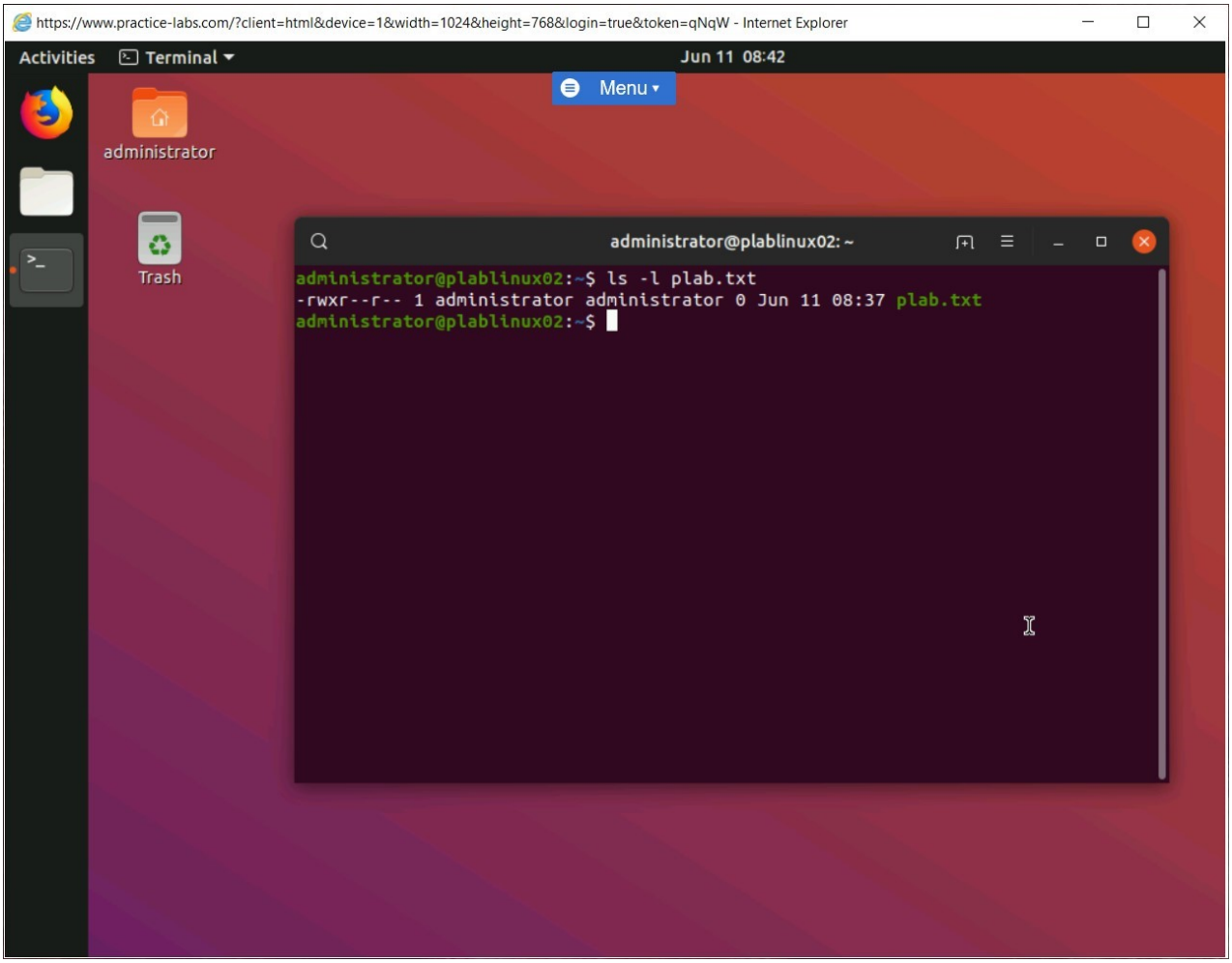


Figure 1.7 Screenshot of PLABLINUX02: Listing the permissions of the plab.txt file.

Step 8

On the **plab.txt** file, you will now add the **write** and **execute** permissions for **Other**. Type the following command:

```
chmod o+wx plab.txt
```

Press **Enter**.

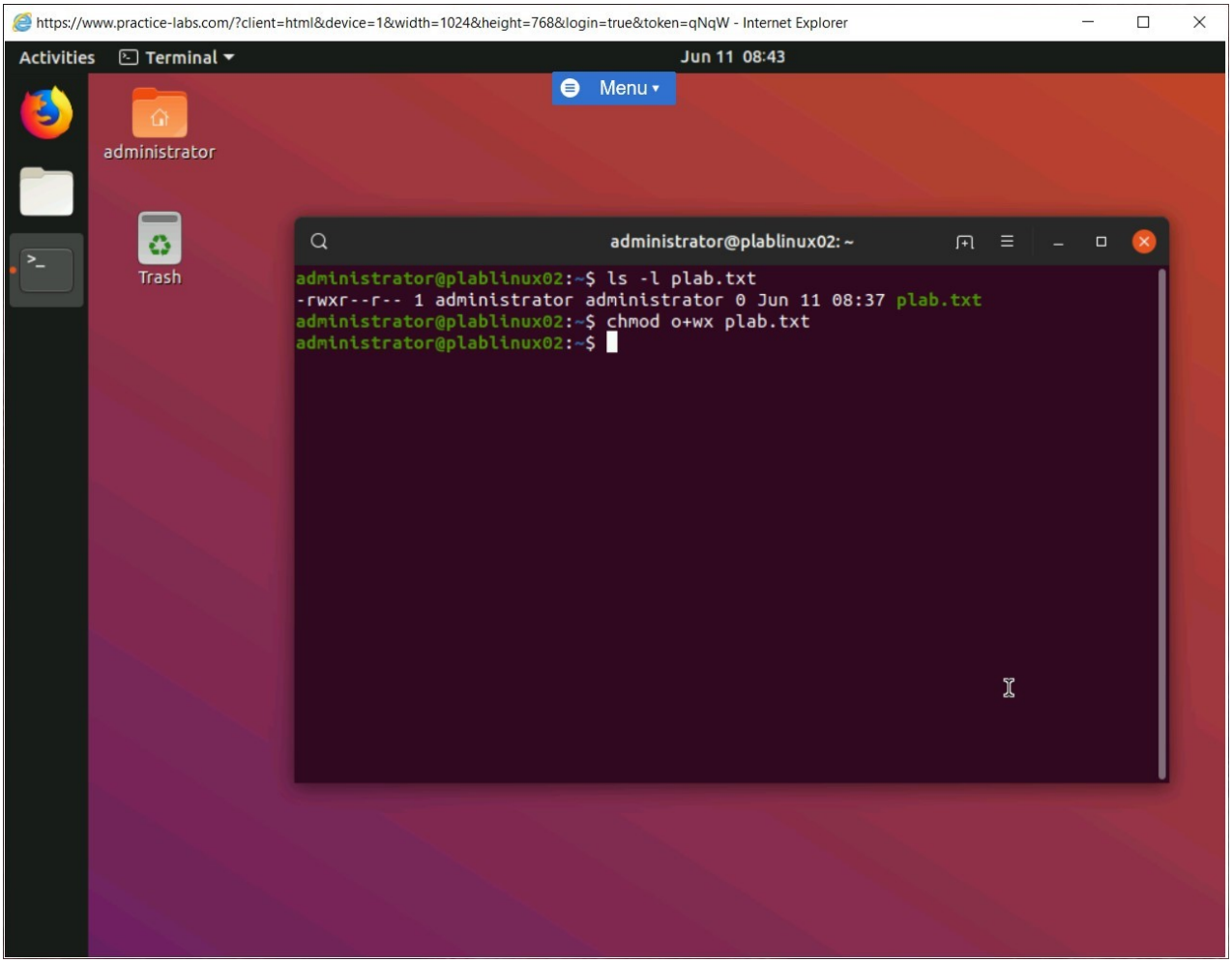


Figure 1.8 Screenshot of PLABLINUX02: Adding the read and write permissions for Other.

Step 9

Clear the screen by entering the following command:

```
clear
```

You can also view the permissions for **plab.txt**. To do that, type the following command:

```
ls -l plab.txt
```

Press **Enter**.

Notice that the write and execute bit for other is now added to the file.

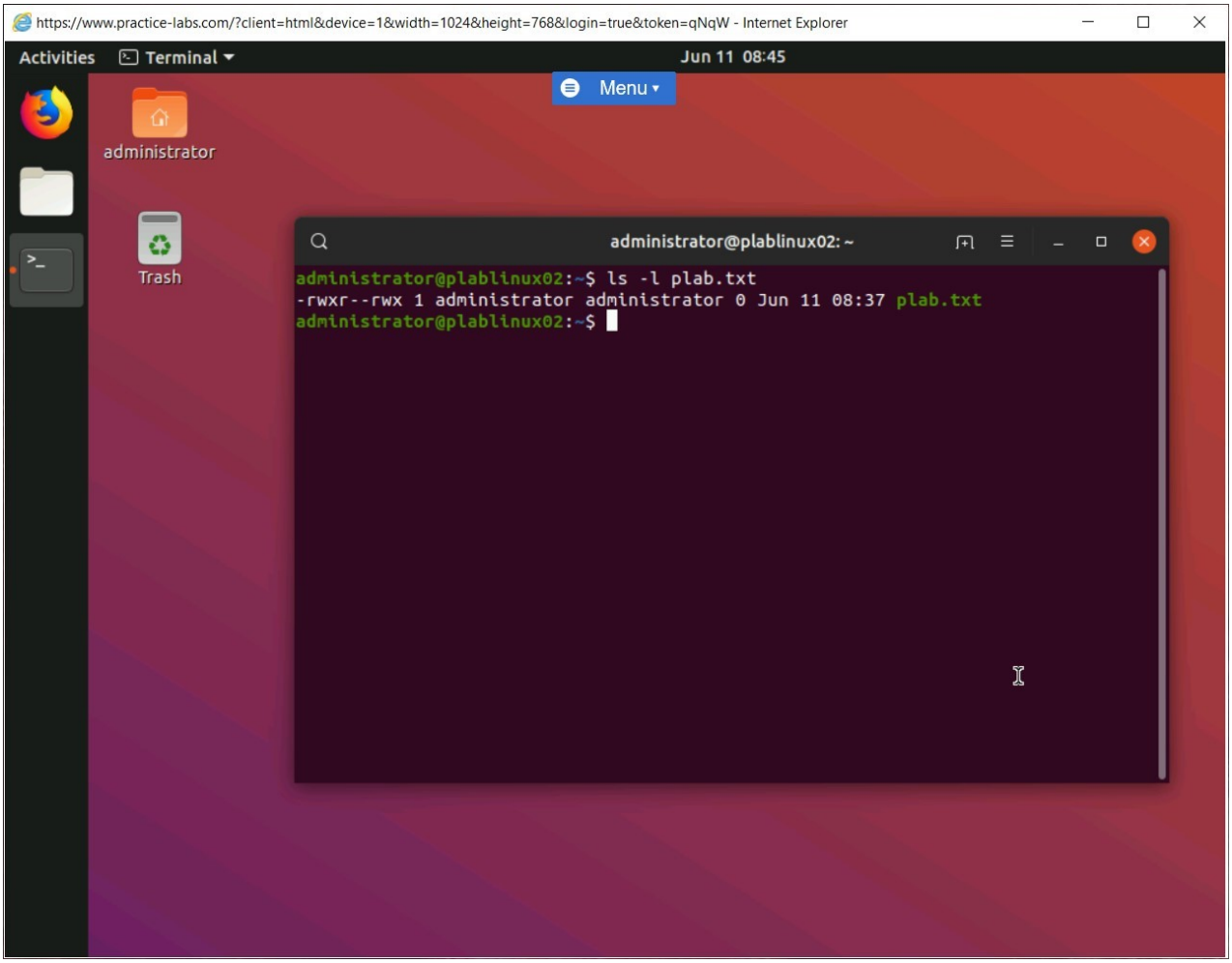


Figure 1.9 Screenshot of PLABLINUX02: Listing the permissions of the plab.txt file.

Step 10

You will now remove the **read** bit for the group. Type the following command:

```
chmod g-r plab.txt
```

Press **Enter**.

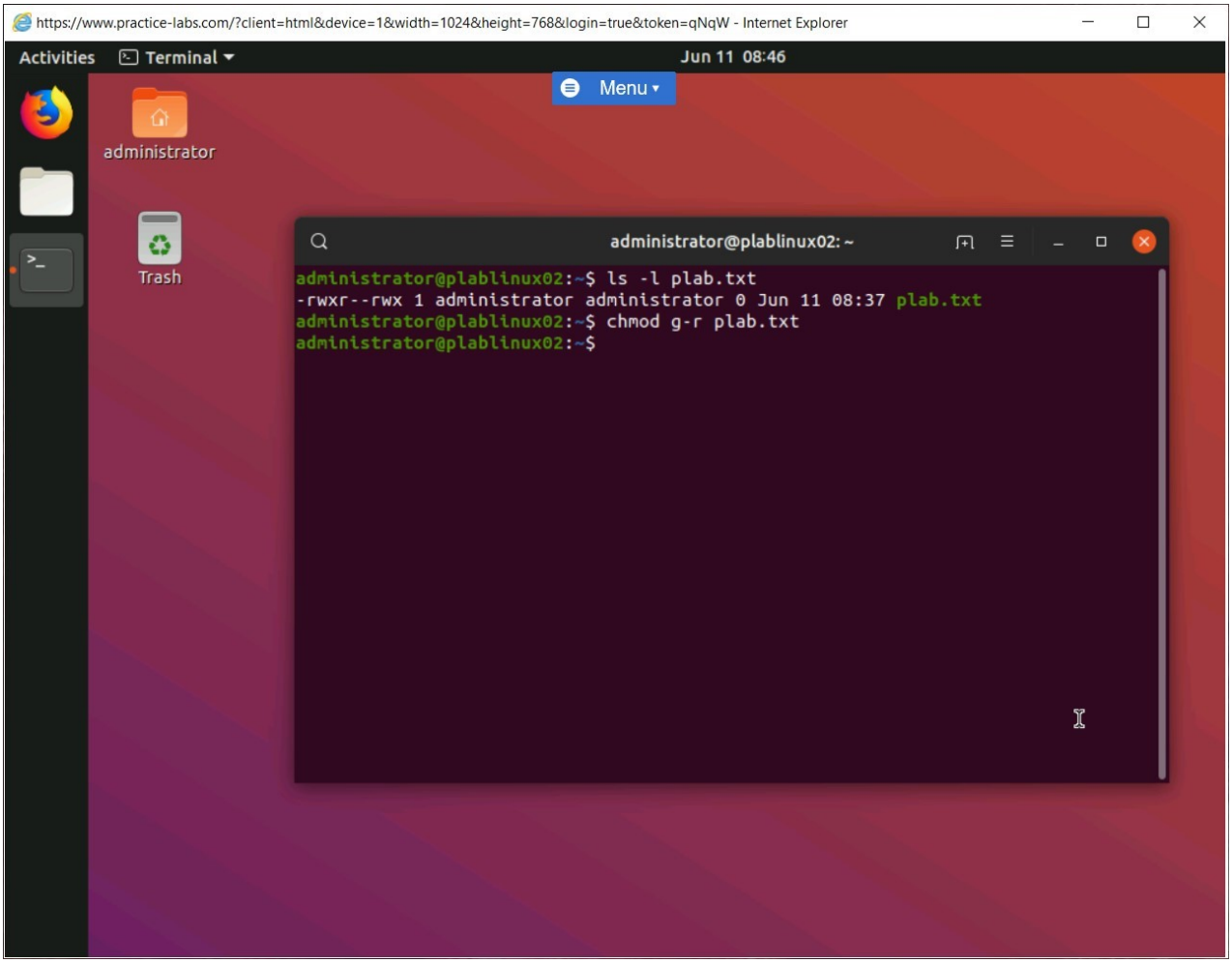


Figure 1.10 Screenshot of PLABLINUX02: Removing the read bit for the group.

Step 11

Type the following command:

```
ls -l plab.txt
```

Press **Enter**.

Notice that the read bit for the group is now removed to the file.

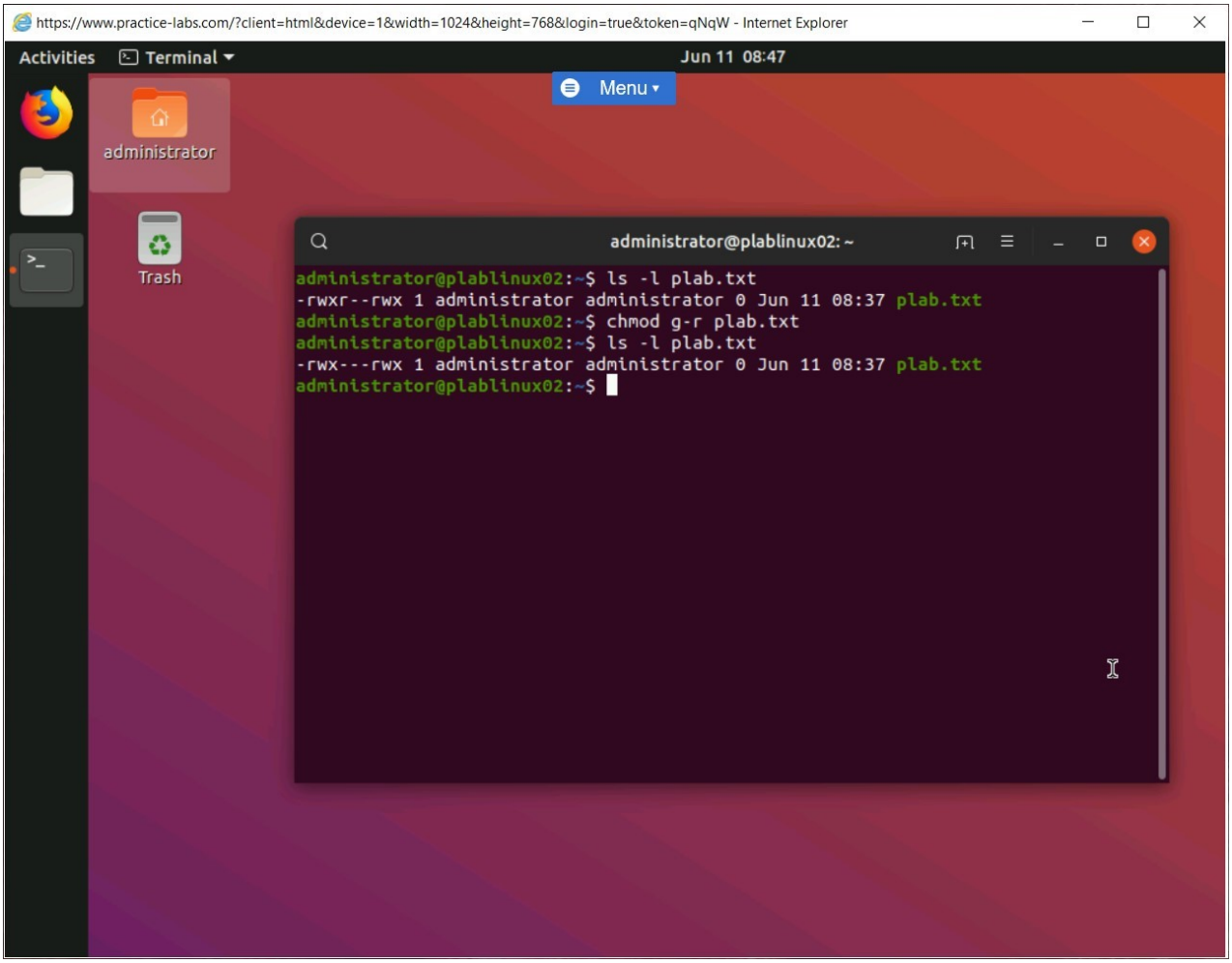


Figure 1.11 Screenshot of PLABLINUX02: Listing the permissions of the plab.txt file.

Step 12

You will now add the **read**, **write**, and **execute** permissions to **Everyone**. Type the following command:

```
chmod ugo+rwx plab.txt
```

Press **Enter**.

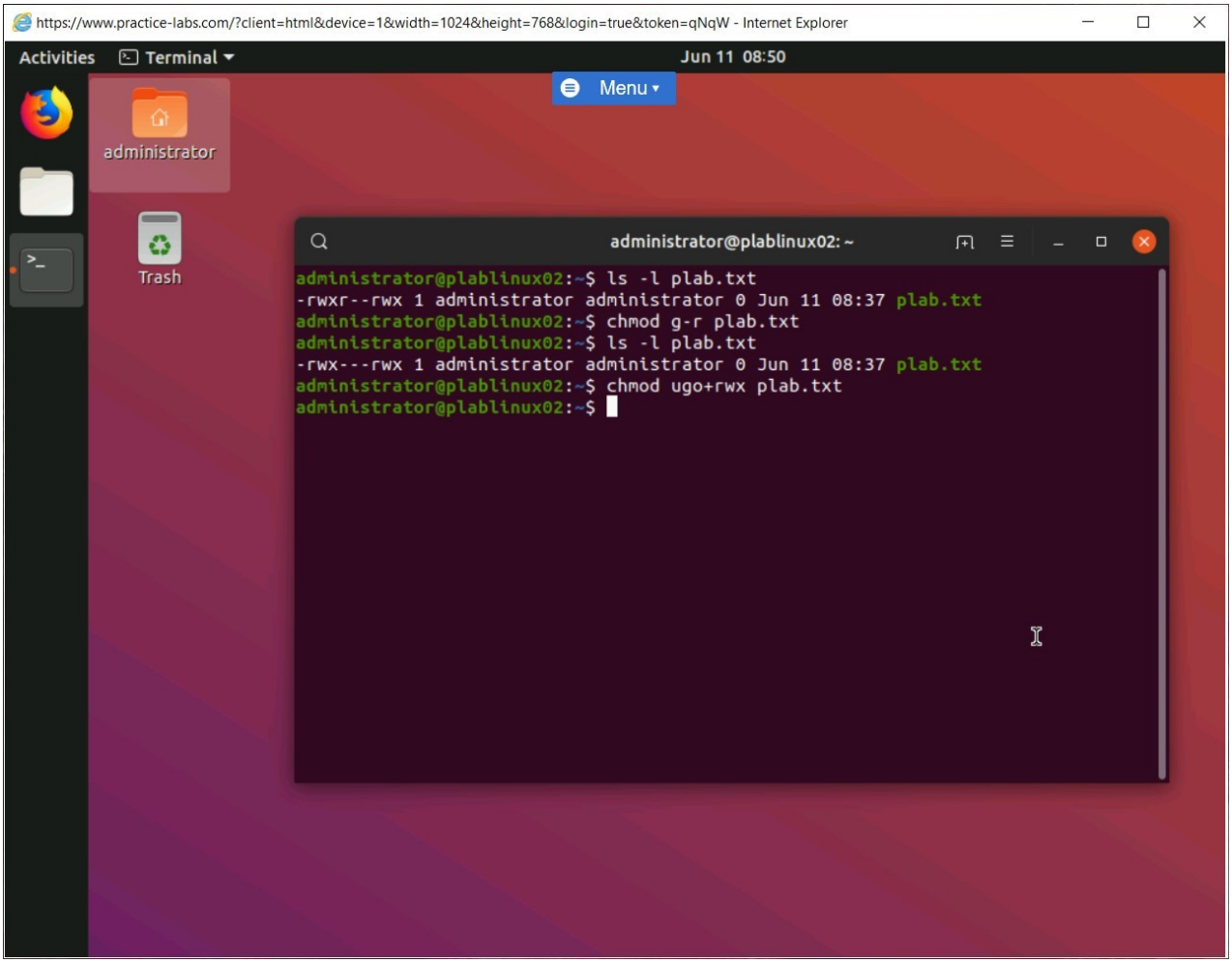


Figure 1.12 Screenshot of PLABLINUX02: Adding the read, write, and execute permissions to Everyone.

Step 13

Type the following command:

```
ls -l plab.txt
```

Press **Enter**.

Notice that the **read**, **write**, and **execute** permissions to **Everyone** is now added to the file.

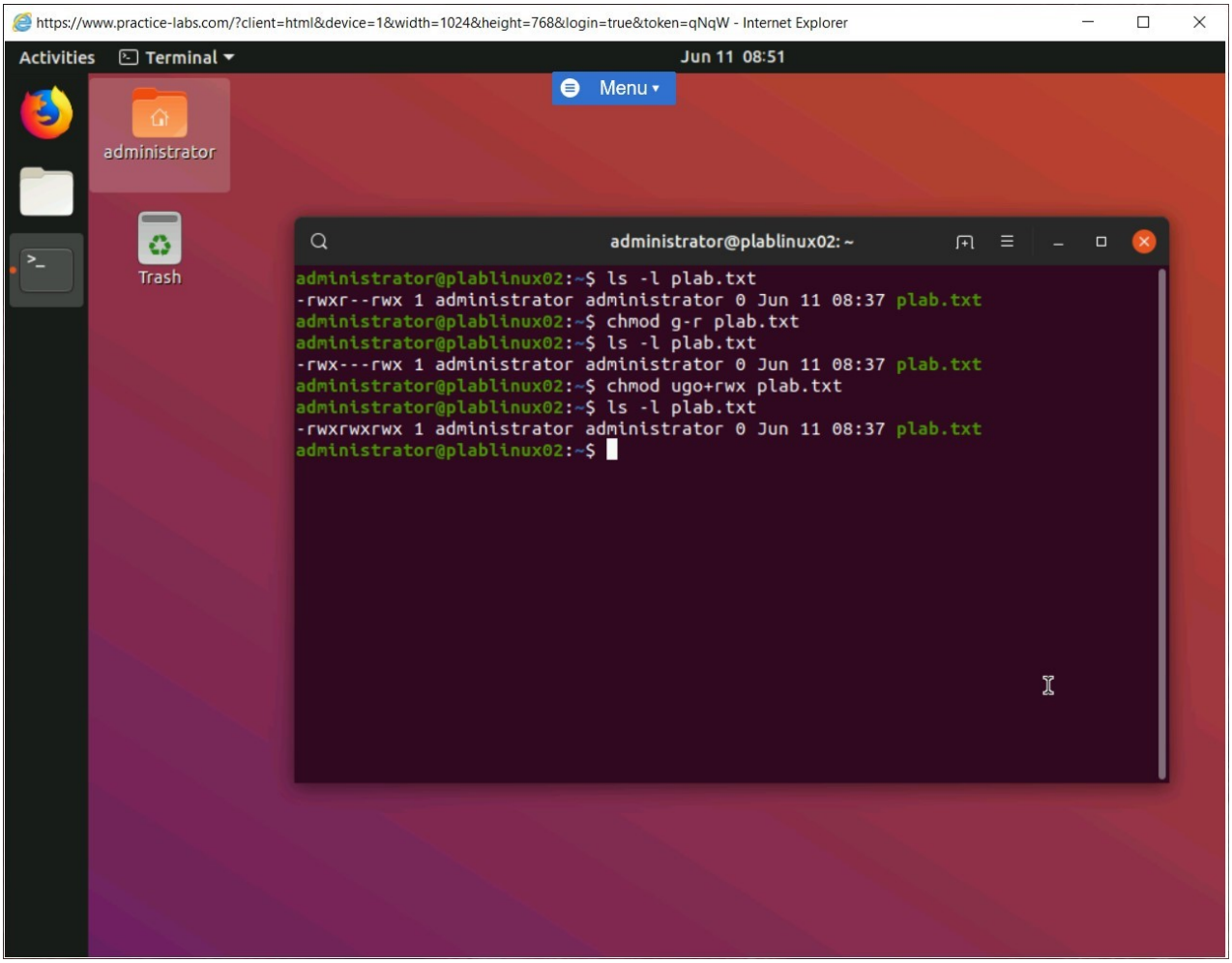


Figure 1.13 Screenshot of PLABLINUX02: Listing the permissions of the plab.txt file.

Task 2 - Change Permissions With Numbers

Using the chmod command, you can also change the permissions using numbers. Each permission has an octal value:

Symbolic	Octal
read	4
write	2
execute	1

Standard permission for files is 666 or -rw-rw-rw-. Standard permission for directories is 777 or -rwxrwxrwx. When a user creates a file, the standard permission, 666, is assigned to the file. This means that read, 4, and write, 2, permission is assigned to the user, group, and other.

Notice that the number **666**, which is an addition of the octal values of read and write permission. Similarly, 777 includes an octal **1** added for the execute permission.

In this task, you will change permissions with numbers. To do this, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

To create a file, type the following command:

```
touch plab2.txt
```

Press **Enter**.

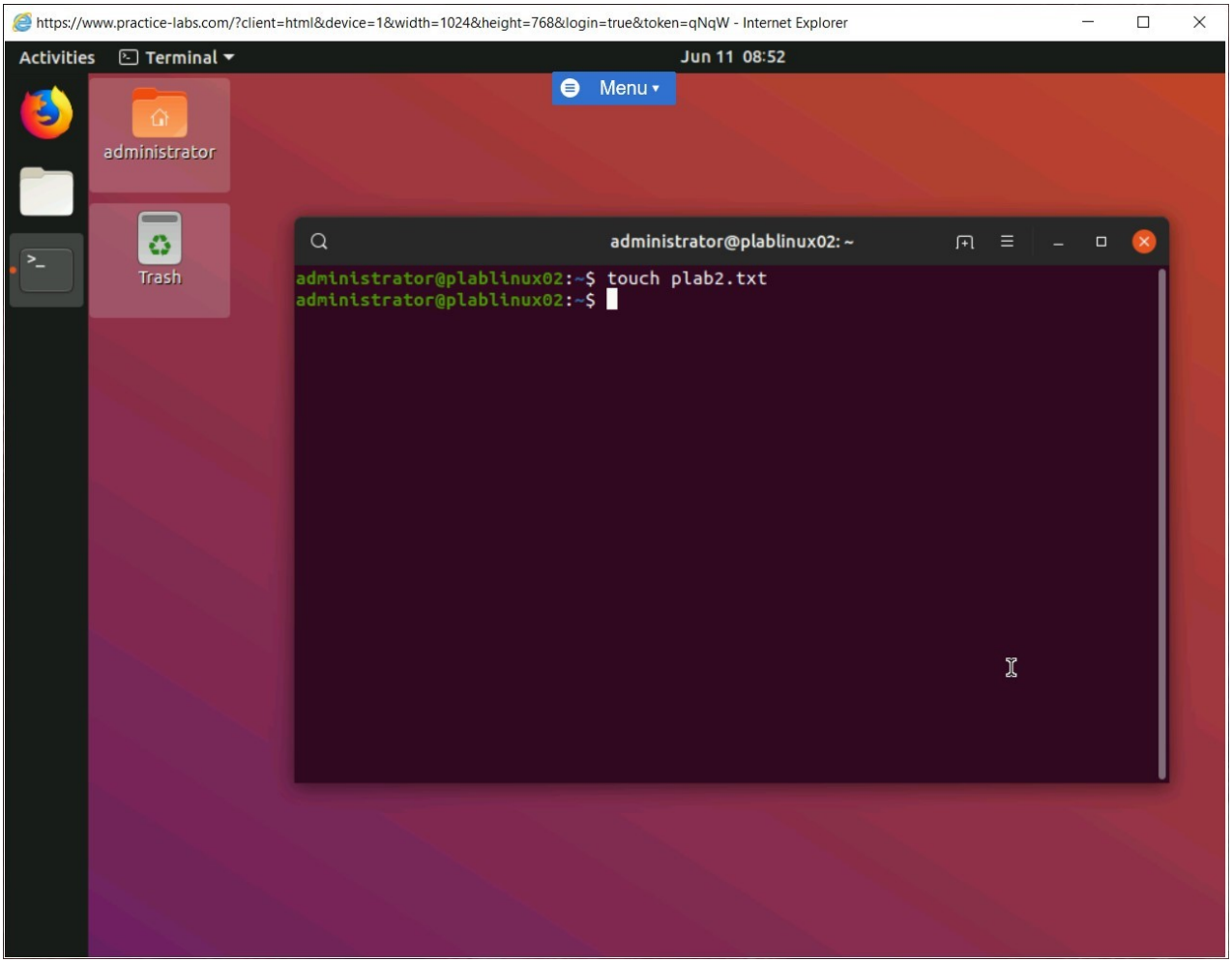


Figure 1.14 Screenshot of PLABLINUX02: Creating the plab2.txt file using the touch command.

Step 2

To verify that the permissions have been changed, type the following command:

```
ls -l plab2.txt
```

Press **Enter**.

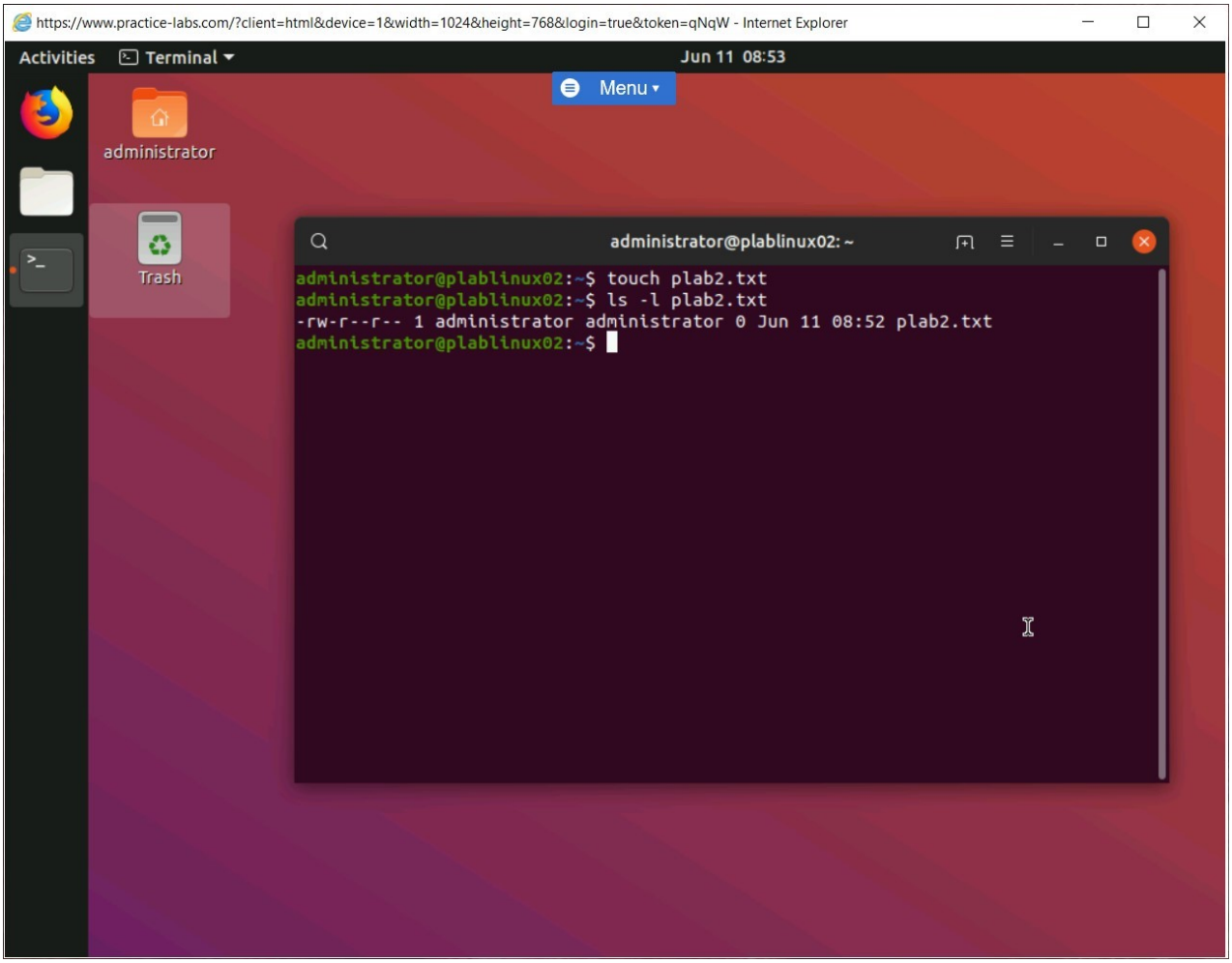


Figure 1.15 Screenshot of PLABLINUX02: Verifying the permissions on the plab2.txt file.

Step 3

To add the owner's **execute** bit, type the following command:

```
chmod 744 plab2.txt
```

Press **Enter**.

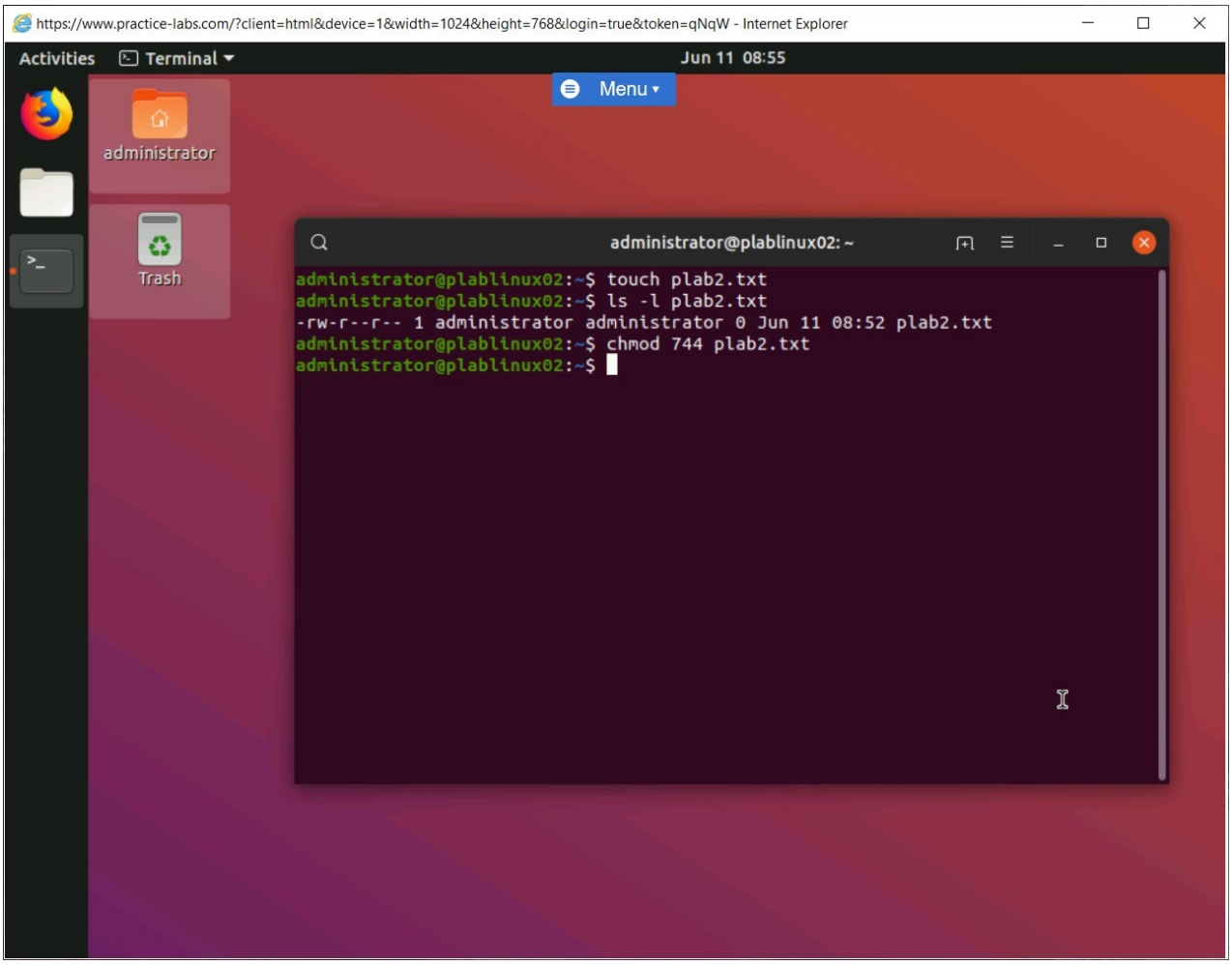


Figure 1.16 Screenshot of PLABLINUX02: Adding the owner's execute bit to the file.

Step 4

To add the **write** & **execute** bit for **Other**, type the following command:

```
chmod 647 plab2.txt
```

Press **Enter**.

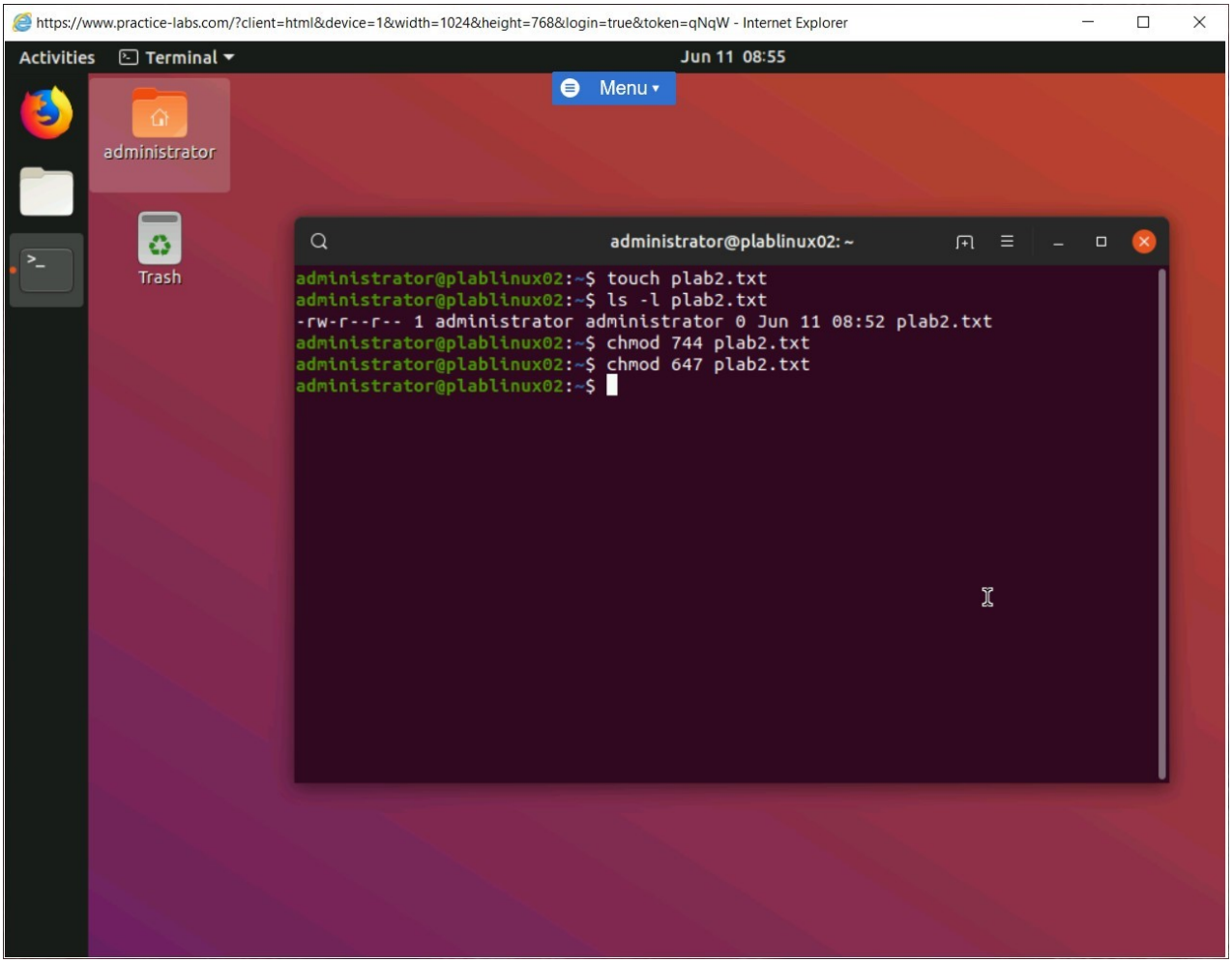


Figure 1.17 Screenshot of PLABLINUX02: Adding the write & execute bit for Other.

Step 5

To verify that the permissions have been changed, type the following command:

```
ls -l plab2.txt
```

Press **Enter**.

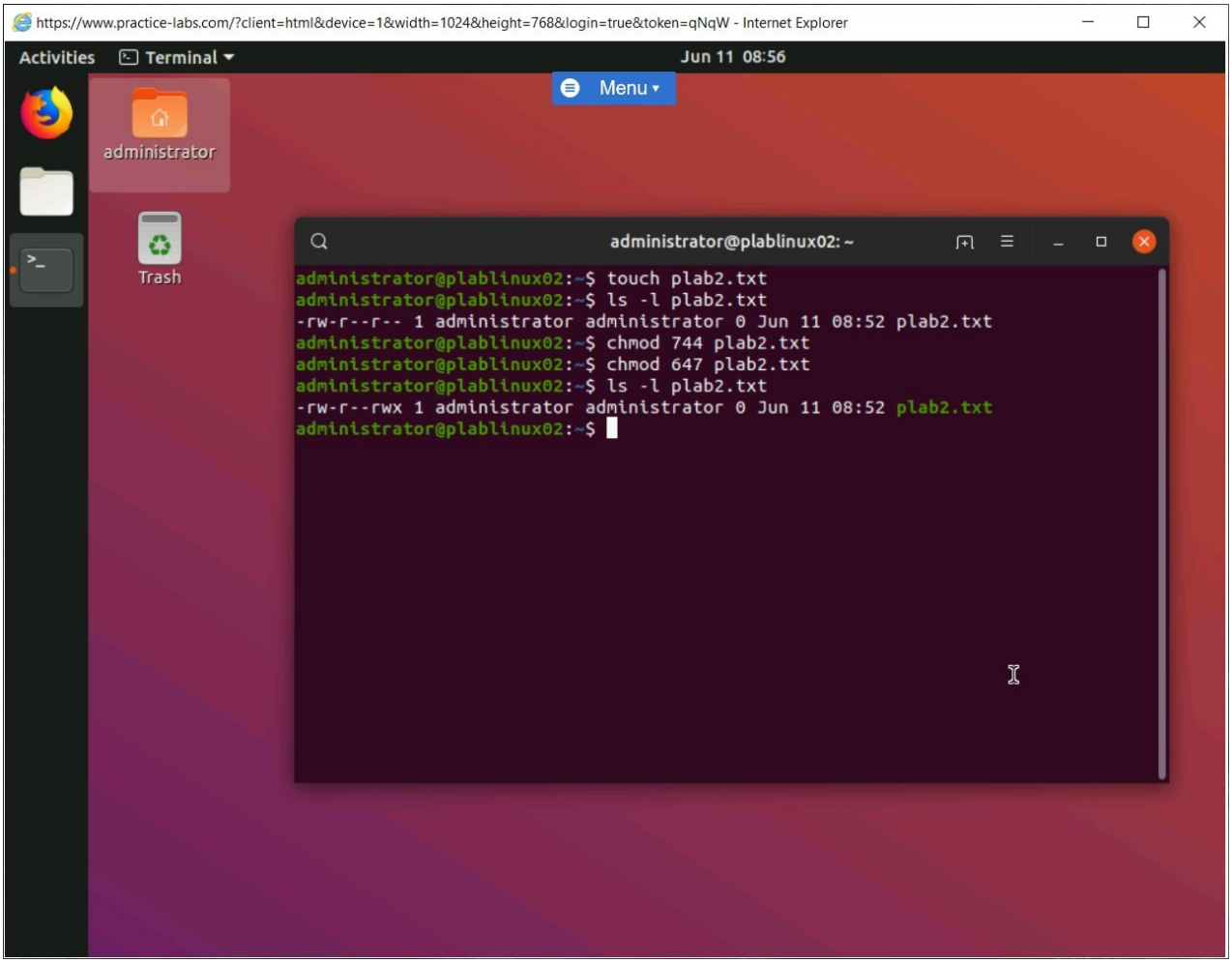


Figure 1.18 Screenshot of PLABLINUX02: Verifying the changed permissions.

Step 6

To remove group bit, type the following command:

```
chmod 607 plab2.txt
```

Press **Enter**.

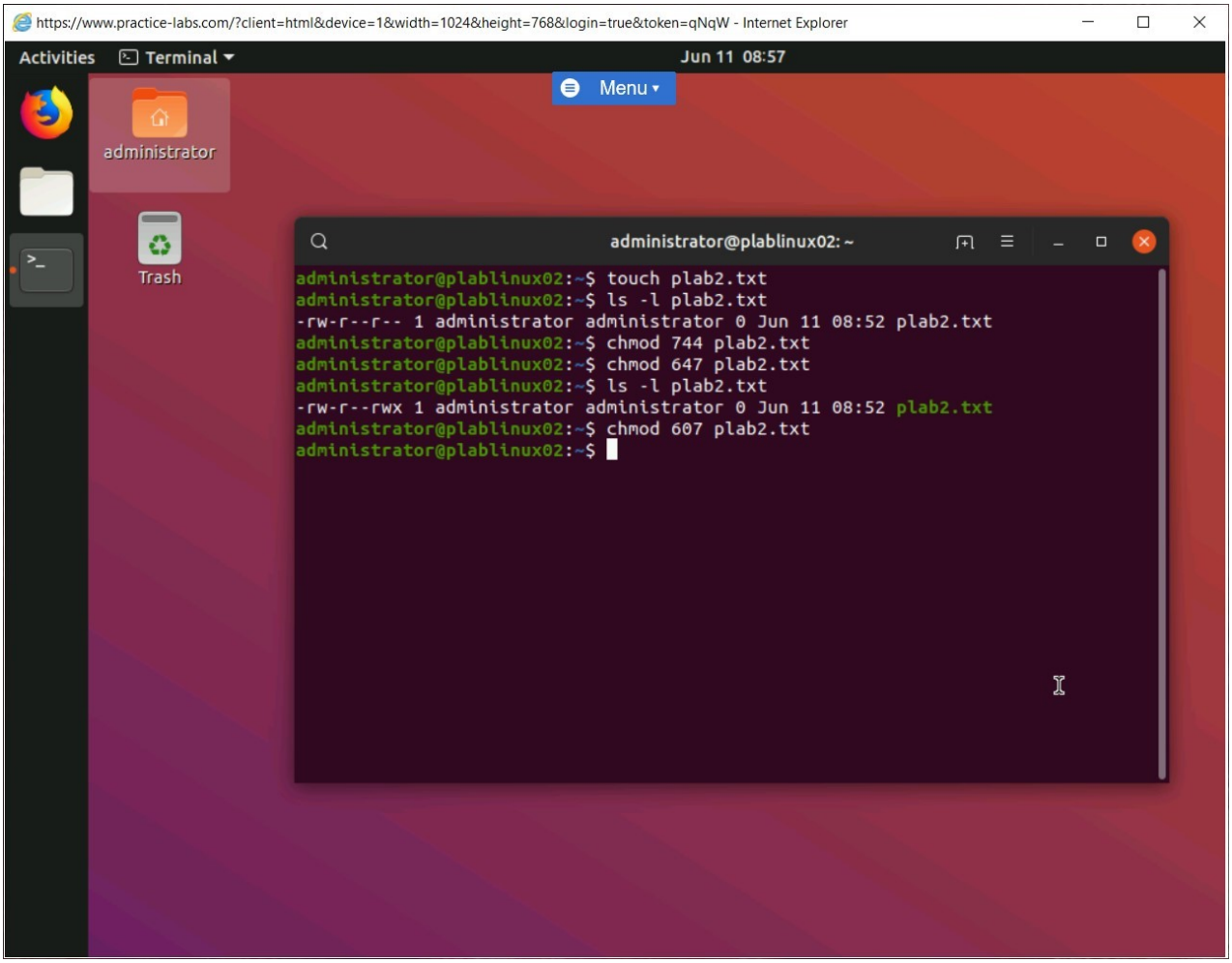


Figure 1.19 Screenshot of PLABLINUX02: Removing the group bit.

Step 7

To verify that the permissions have been changed, type the following command:

```
ls -l plab2.txt
```

Press **Enter**.

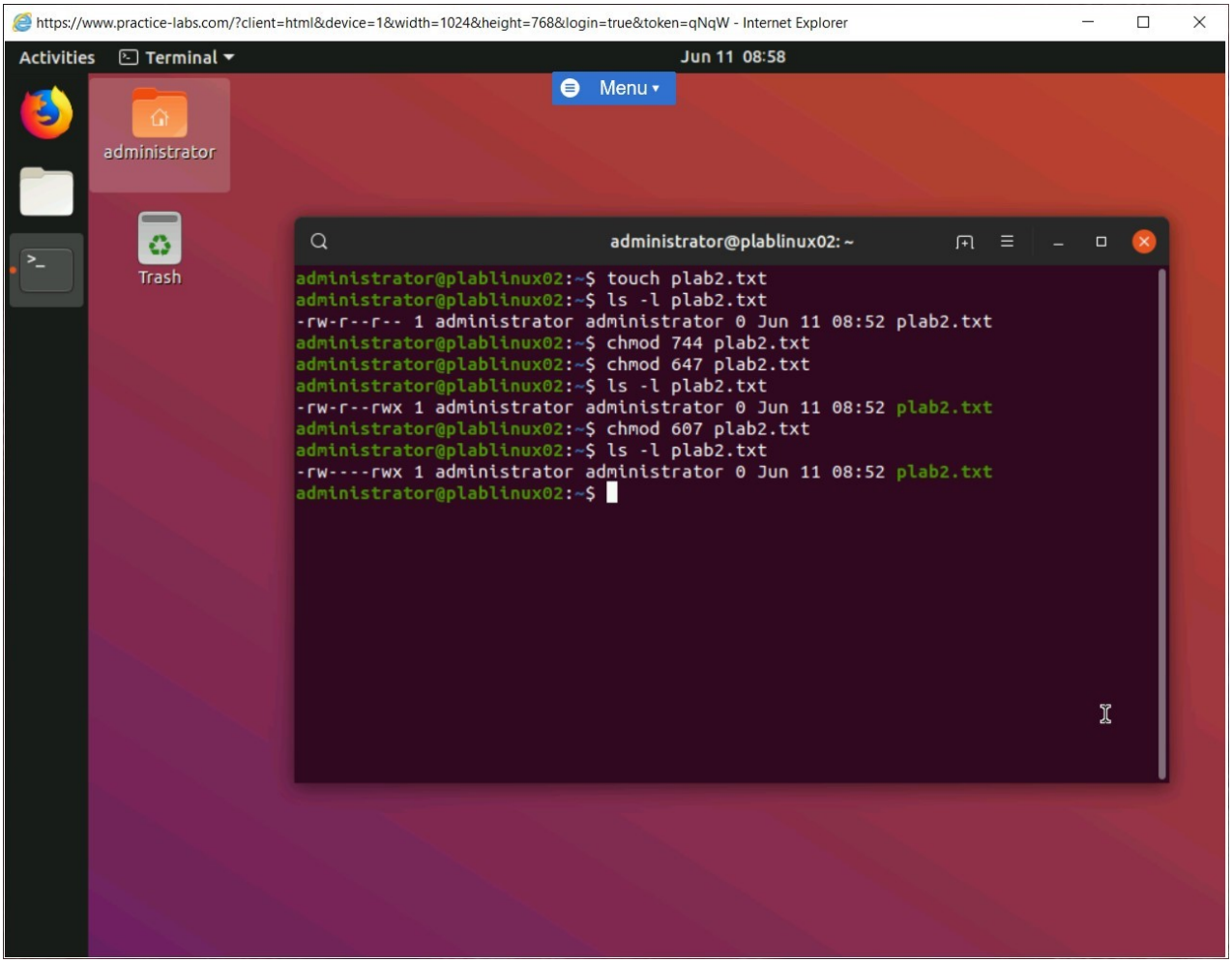


Figure 1.20 Screenshot of PLABLINUX02: Verifying the changed permissions.

Task 3 - Use Commands to Check Permissions (chmod, chown, chgrp)

There are various commands that can be used for managing file permissions and ownership. The chmod command is used for managing the file permissions. The chown command is used for changing the ownership. The chgrp command is used for changing the group. To use commands to check permissions, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

To create **plab3.txt**, type the following command:

```
touch plab3.txt
```

Press **Enter**. The **plab3.txt** file is now created.

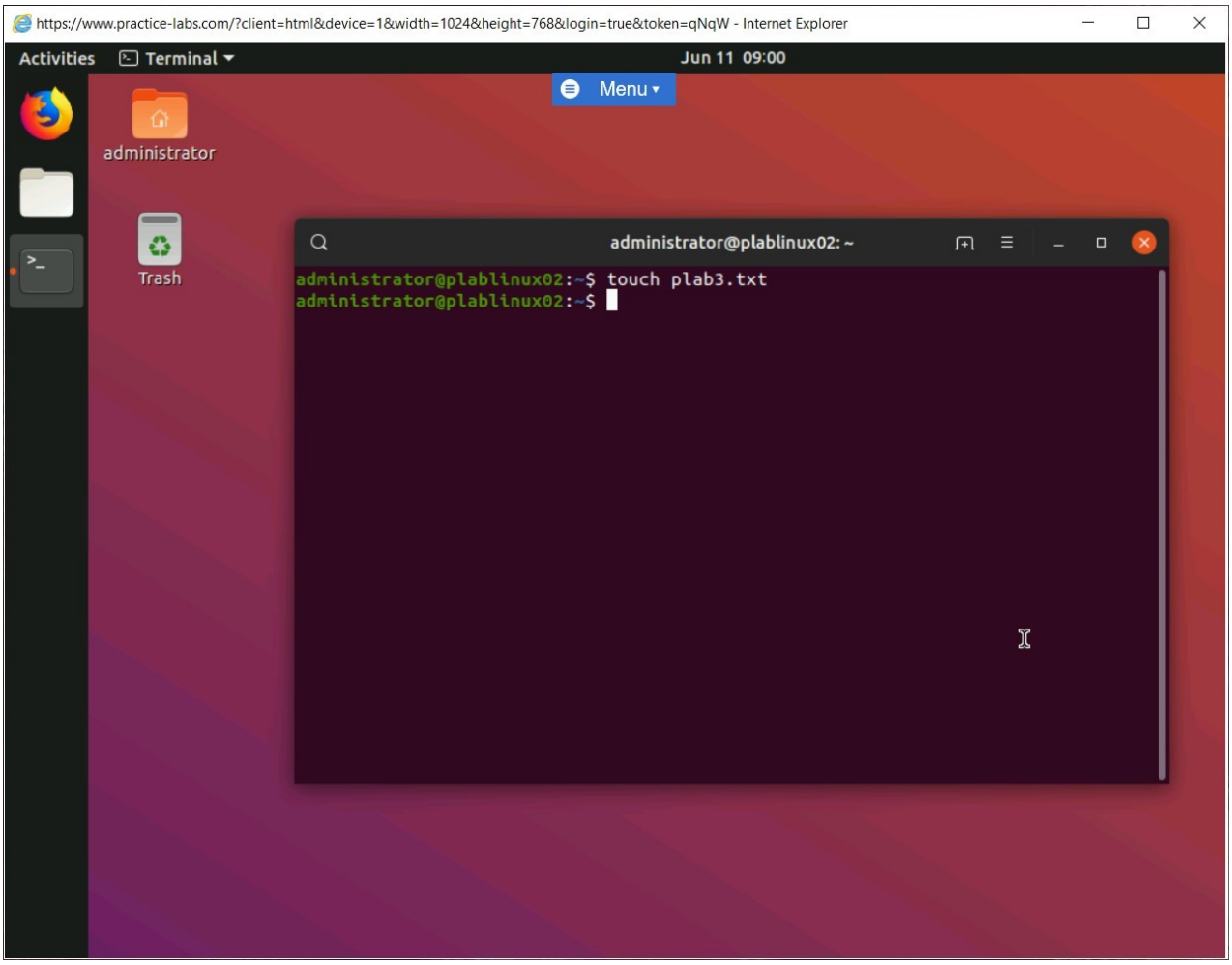


Figure 1.21 Screenshot of PLABLINUX02: Creating a new file with the touch command.

Step 2

> ***Note:*** *The chmod command has been covered in detail in the previous exercises. Therefore, this task will focus on the chown and chgrp commands.*

Clear the screen by entering the following command:

```
clear
```

Let's first create a user. Type the following command:

```
sudo useradd matt
```

Press **Enter**.

When prompted for a password, type the following:

`Passw0rd`

Press **Enter**.

> ***Note:*** *Even though the user matt is in the locked state, you can still assign the ownership.*

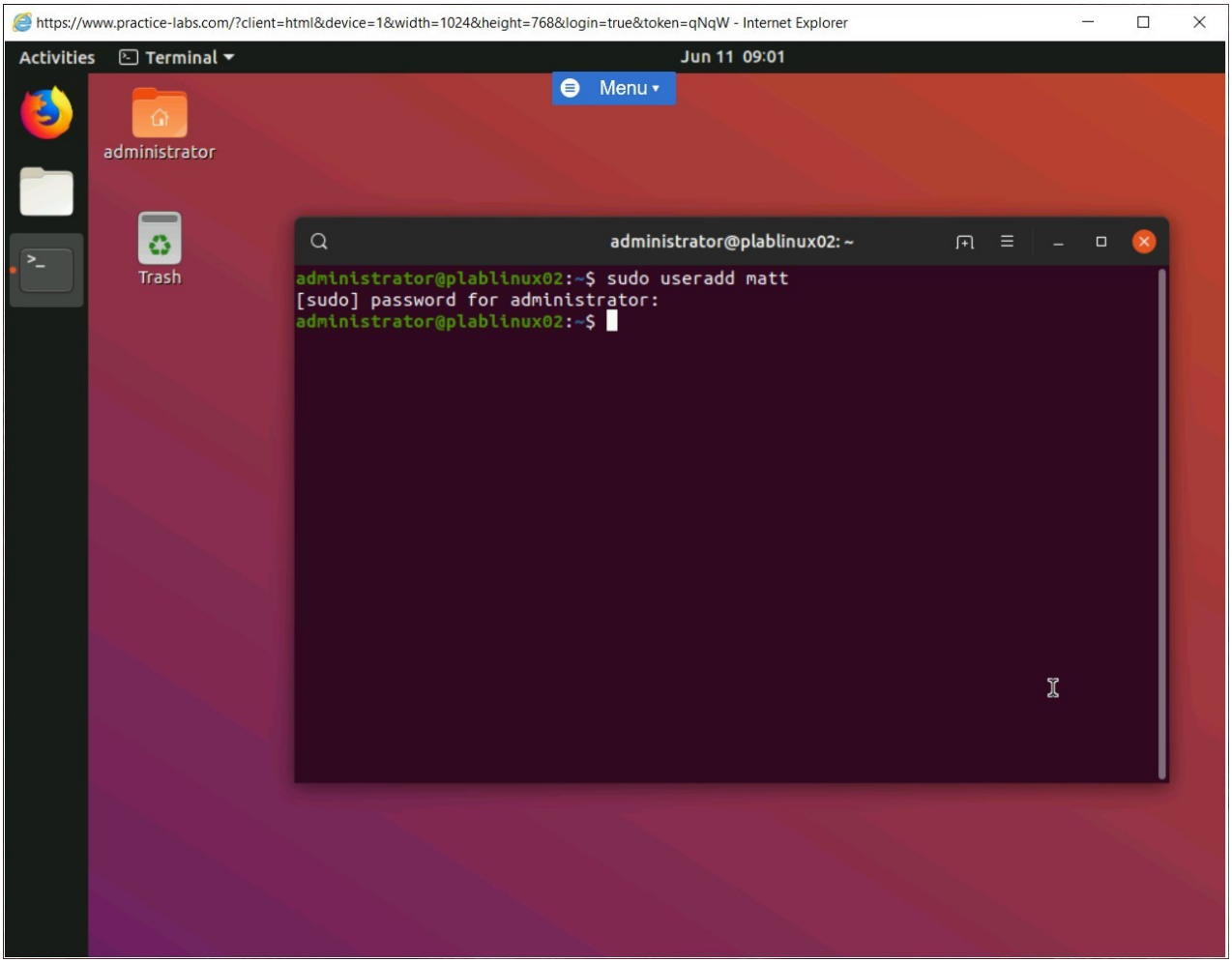


Figure 1.22 Screenshot of PLABLINUX02: Creating a user account.

Step 3

To change the ownership of the **plab3.txt** file, type the following command:

```
sudo chown matt plab3.txt
```

Press **Enter**.

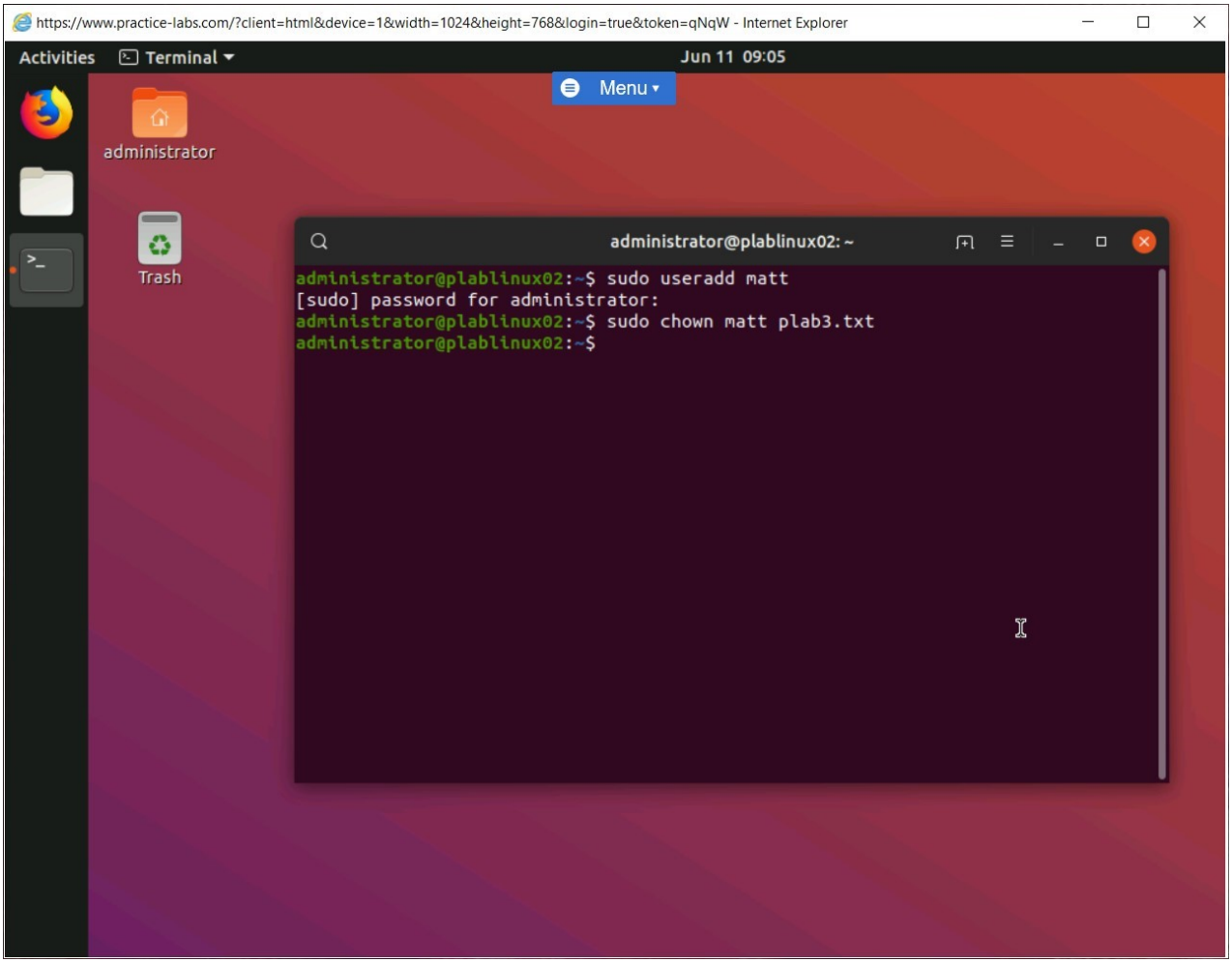


Figure 1.23 Screenshot of PLABLINUX02: Changing the ownership of the plab3.txt file

Step 4

To verify that the ownership that has changed, type the following command:

```
ls -l plab3.txt
```

Press **Enter**. Notice that matt is the owner of the file.

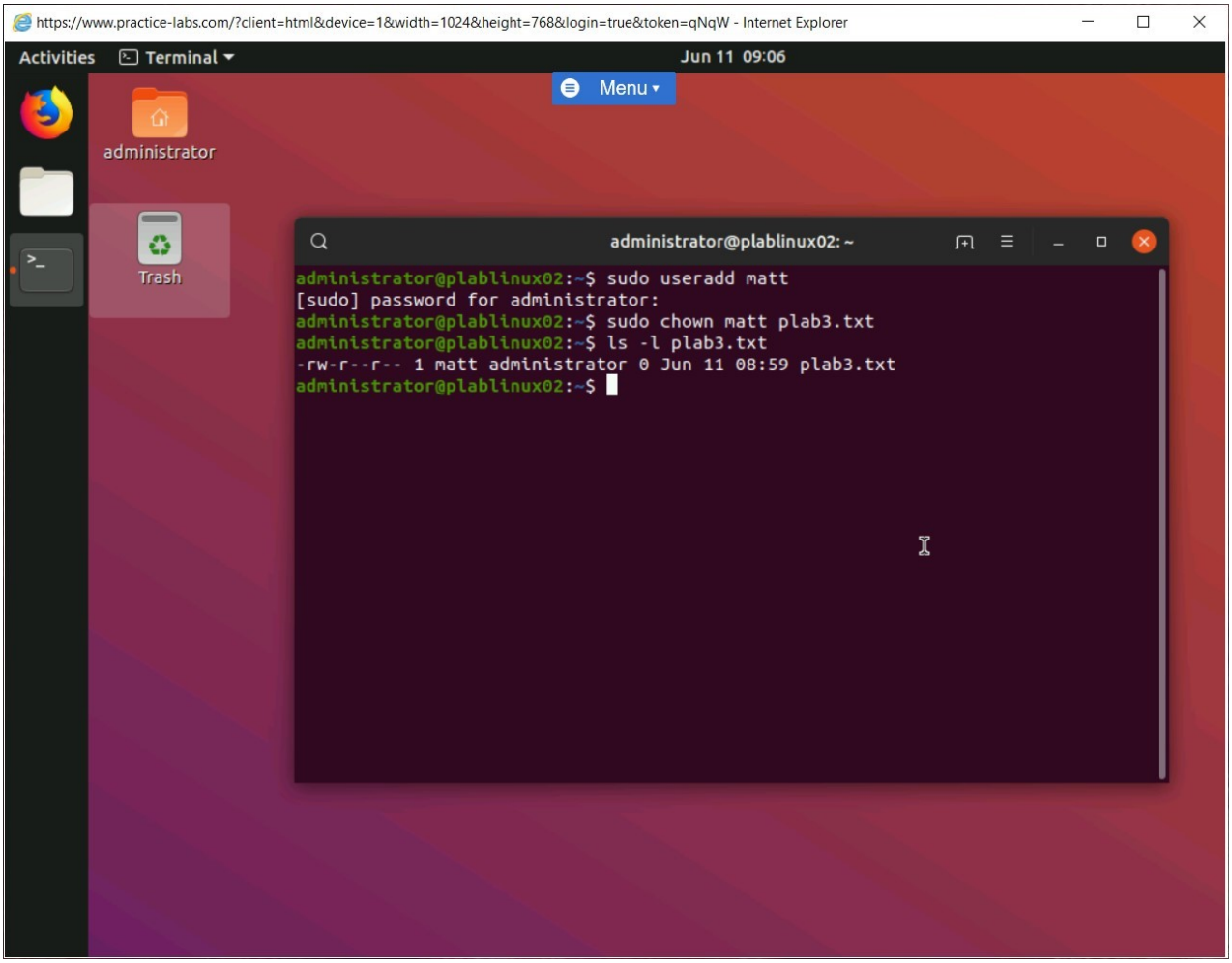


Figure 1.24 Screenshot of PLABLINUX02: Verifying the changed permissions.

Step 5

To change the group to **matt**, type the following command:

```
sudo chgrp matt plab3.txt
```

Press **Enter**. Notice that matt is also the group assigned to the file.

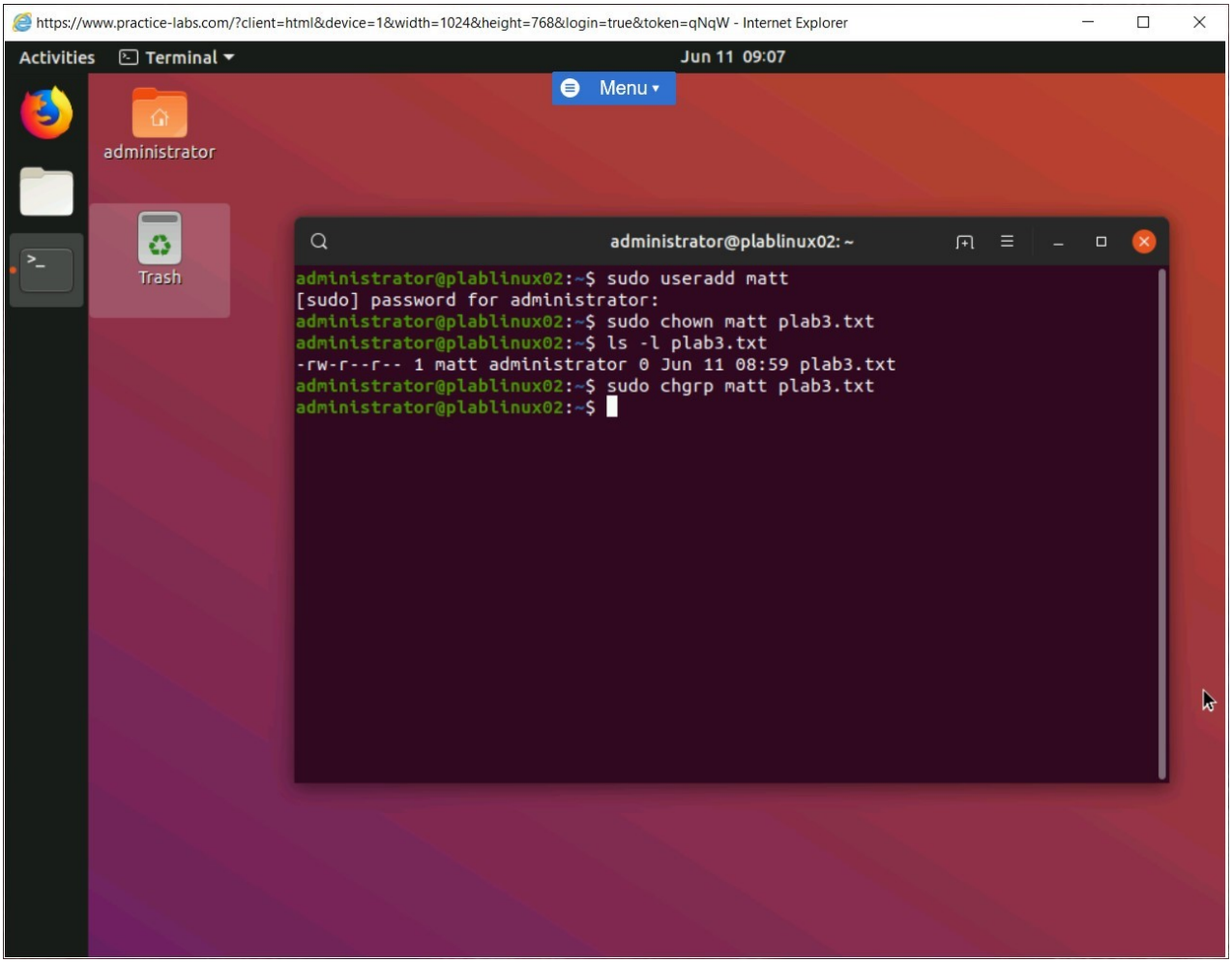


Figure 1.25 Screenshot of PLABLINUX02: Changing the group to matt.

Step 6

You can also change the group using the chown command. However, the syntax is slightly different than chgrp. To change the group to the **administrator**, type the following command:

```
sudo chown :administrator plab3.txt
```

Press **Enter**. Notice that the administrator group is assigned to the file.

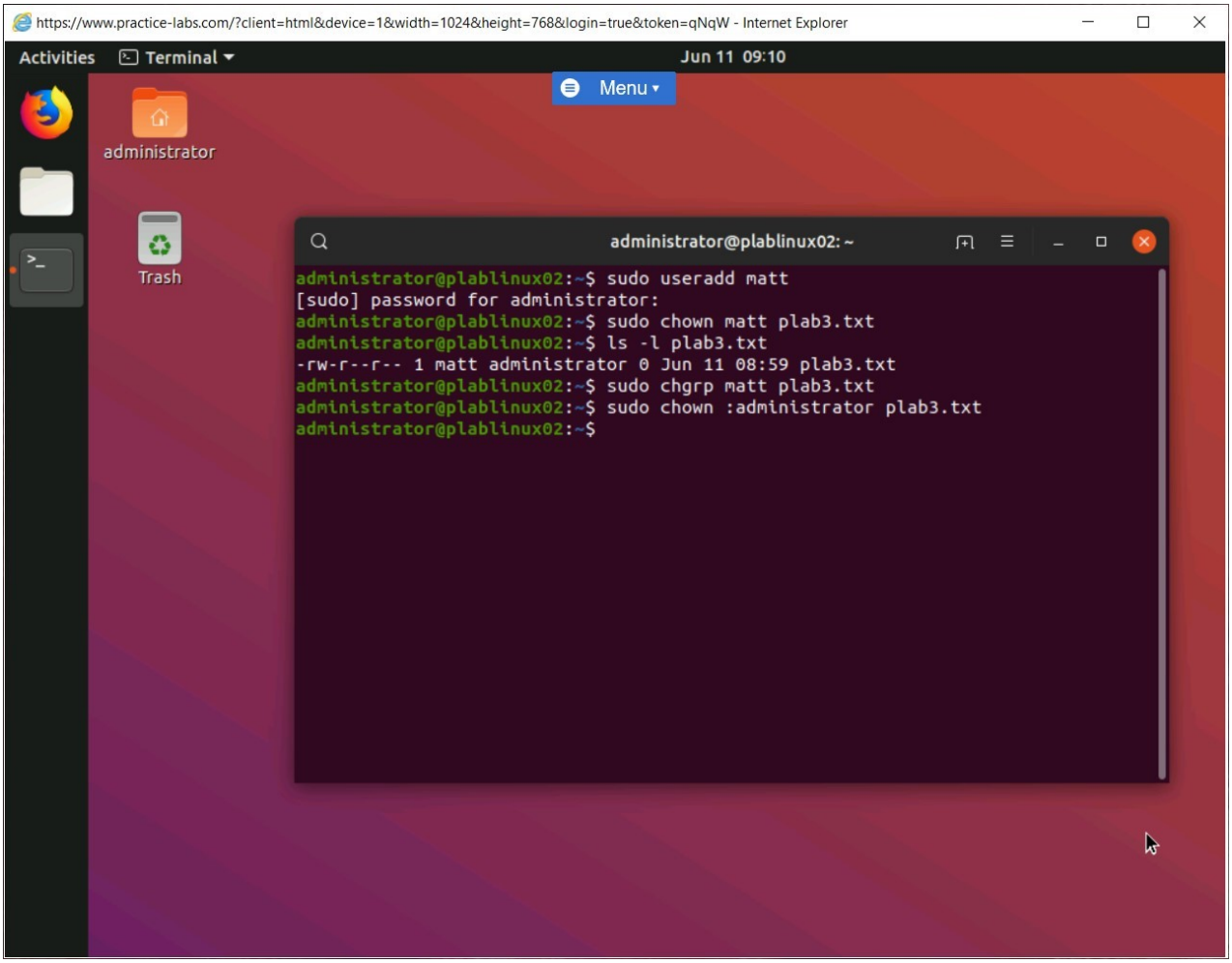


Figure 1.26 Screenshot of PLABLINUX02: Changing the group to the administrator.

Step 7

To verify that the group has changed, type the following command:

```
ls -l plab3.txt
```

Press **Enter**. Notice that **matt** is the owner of the file, but the group is the **administrator**.

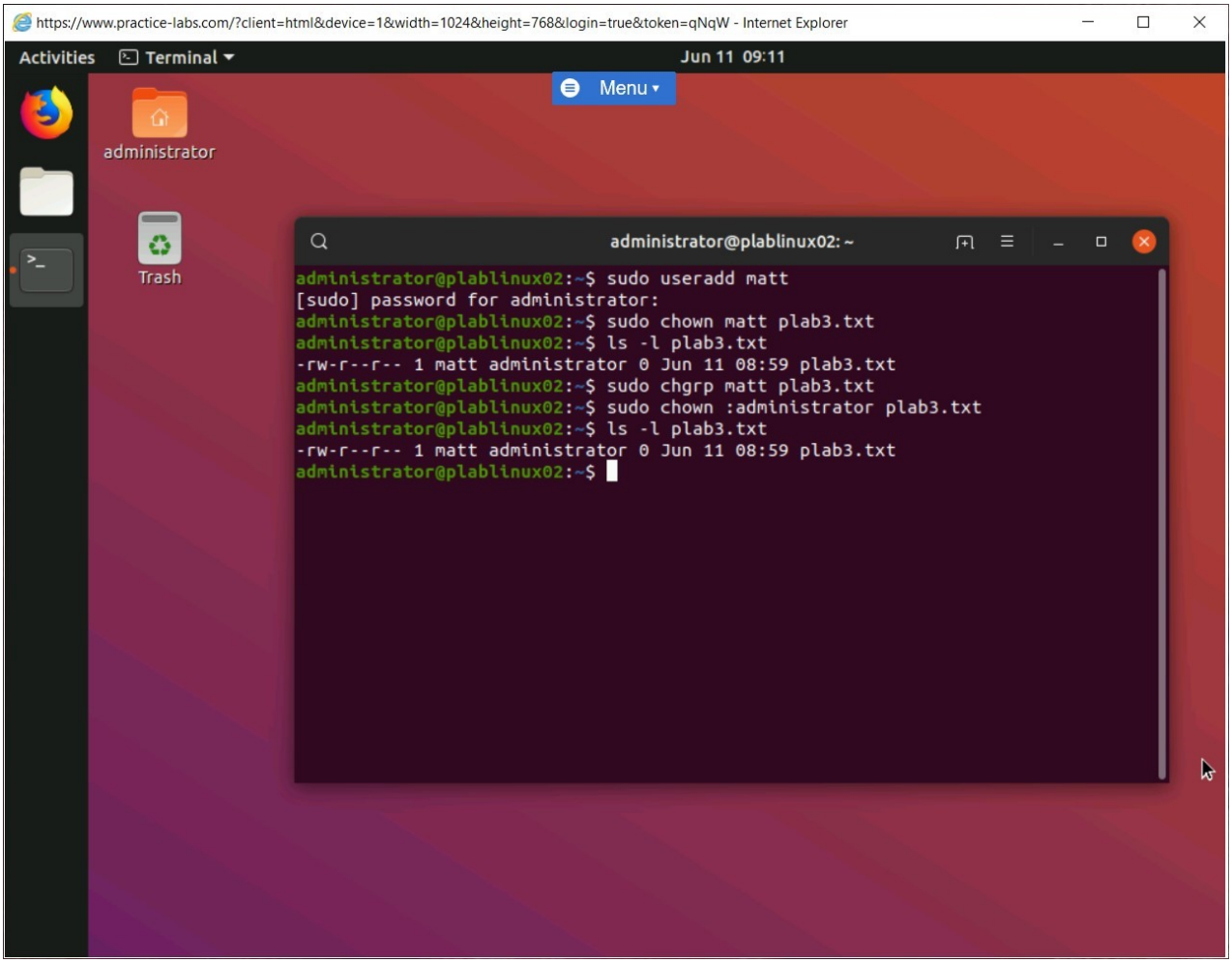


Figure 1.27 Screenshot of PLABLINUX02: Verifying the changed permissions.

Keep all devices in their current state and proceed to the next exercise.

Review

Well done, you have completed the **Configure Permissions on Files and Directories** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Configure Permissions on Files and Directories

You should now be able to:

- Configure file permissions
- Change Permissions with Numbers
- Use commands to check permissions (chmod, chown, chgrp)

Feedback

Shutdown all virtual machines used in this lab. Alternatively, you can log out of the lab platform.