CompTIA Linux+

Working with Kernel, Boot Modules, and Files

Introduction

Welcome to the **Working with Kernel, Boot Modules, and Files** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Kernel
Boot Modules
Files

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Working with the kernel commands

After completing this lab, you will be able to:

- Check Linux Kernel Version
- Work with Kernel and Module Files

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 104.1 Create partitions and filesystems
- **CompTIA:** 1.4 Given a scenario, manage storage in a Linux environment.

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.

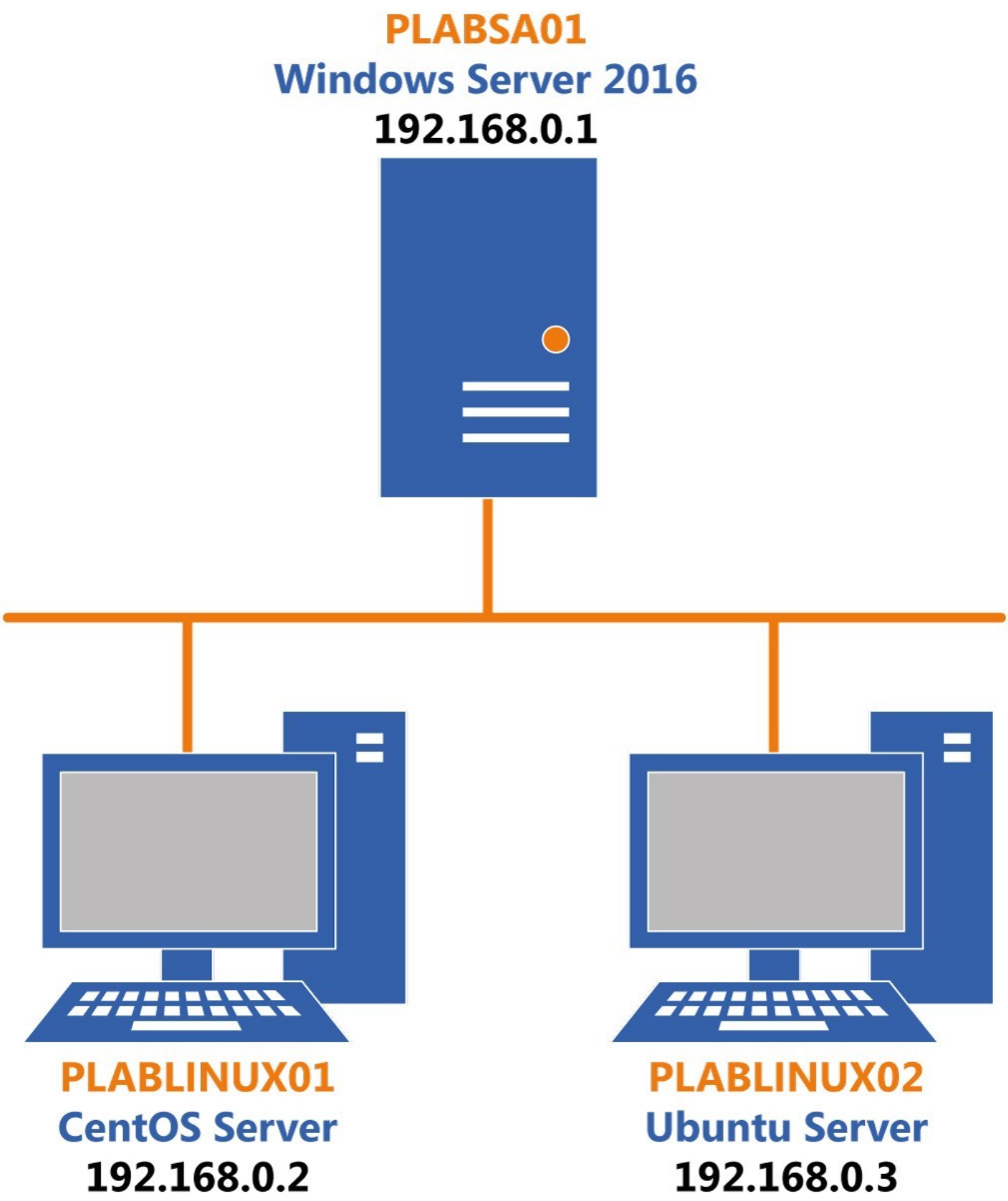
Help and Support

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 - Working with the Kernel Commands

A kernel is the lowest level software, which is responsible for interfacing with the system hardware. It interfaces with the applications to the physical hardware of the system. It is important to note that a kernel can be replaced in a Linux system.

In this exercise, you will work with various kernel commands.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Check Linux Kernel Version
- Work with Kernel and Module Files

Your Devices

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

- **PLABLINUX02** (Ubuntu Server)

Task 1 - Check Linux Kernel Version

There will be situations in which you would need to find the kernel versions. There are various commands that can be used for this purpose.

In this task, you will learn to use different commands to find the kernel version. To do this, perform the following steps:

Step 1

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

> ***Note:*** *If you are prompted with the* ***Software Updater*** *dialog box, click* ***Remind Me Later****. This dialog box may occur before or after this step.*

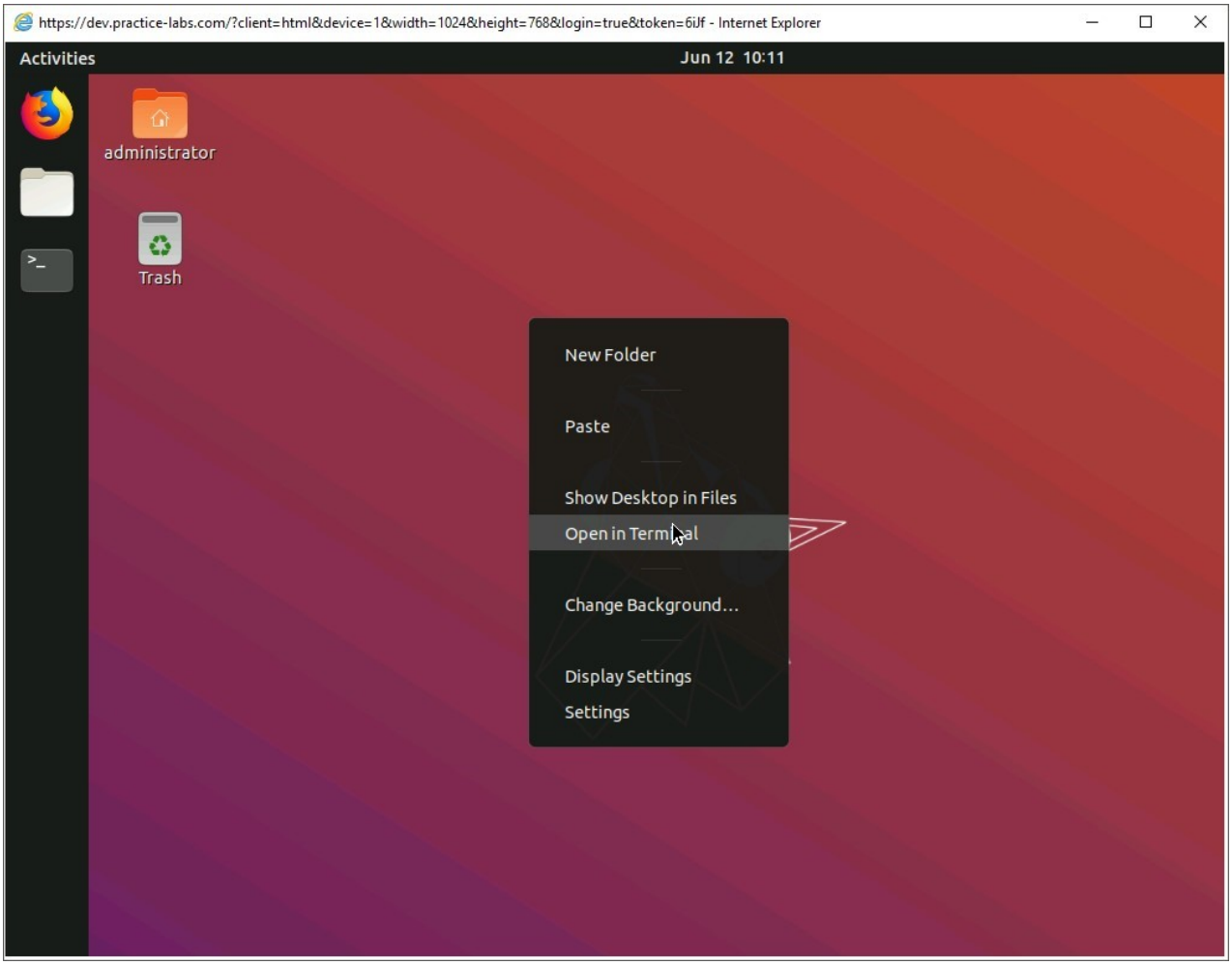


Figure 1.1 Screenshot of PLABLINUX02: Selecting the Open Terminal option from the context menu.

Step 2

The terminal window is displayed.

To display the kernel version number, type the following command:

```
uname -r
```

Press **Enter**.

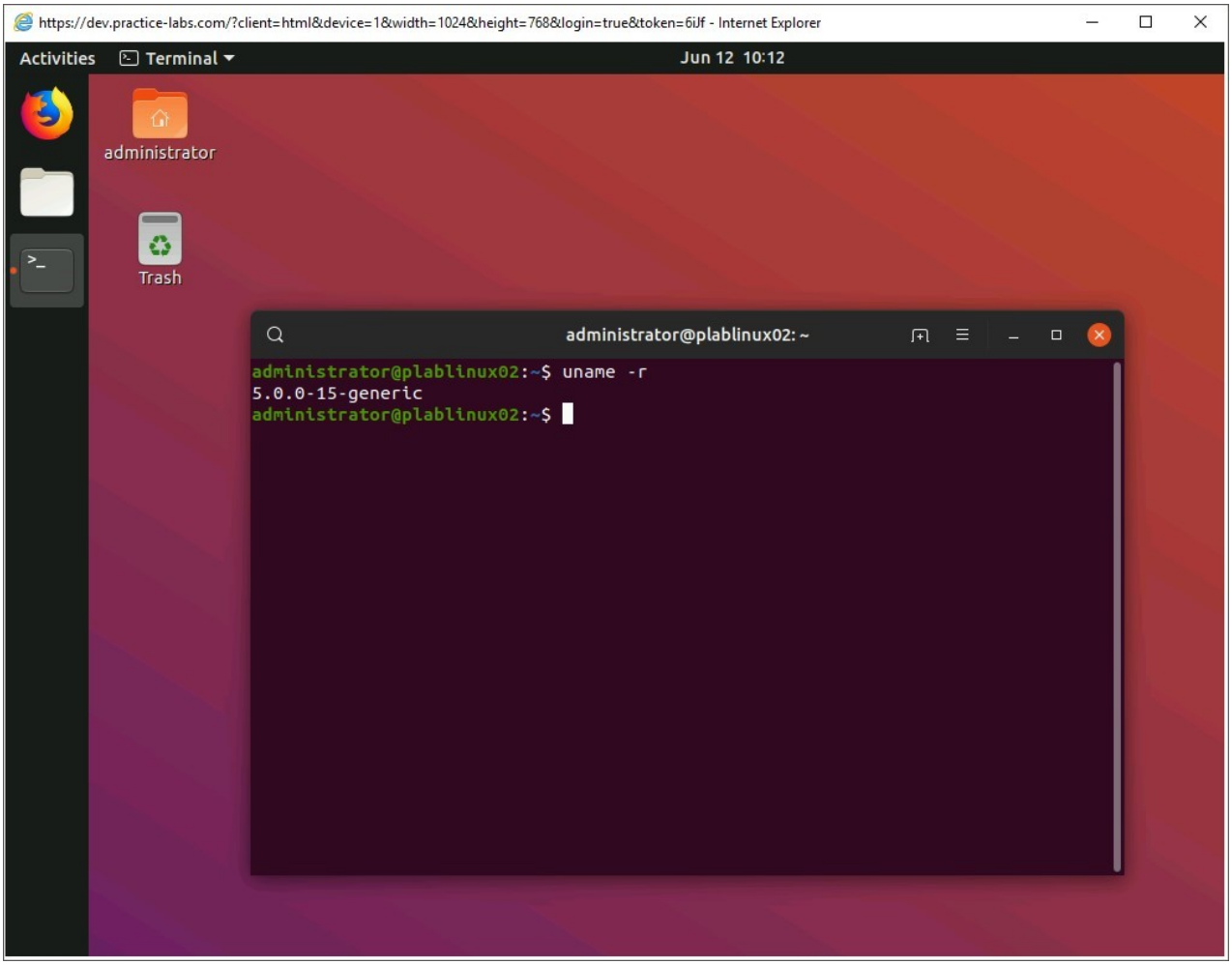


Figure 1.2 Screenshot of PLABLINUX02: Displaying the kernel version number.

Step 3

To display more information about the Linux distribution being used, type the following command:

```
uname -a
```

Press **Enter**.

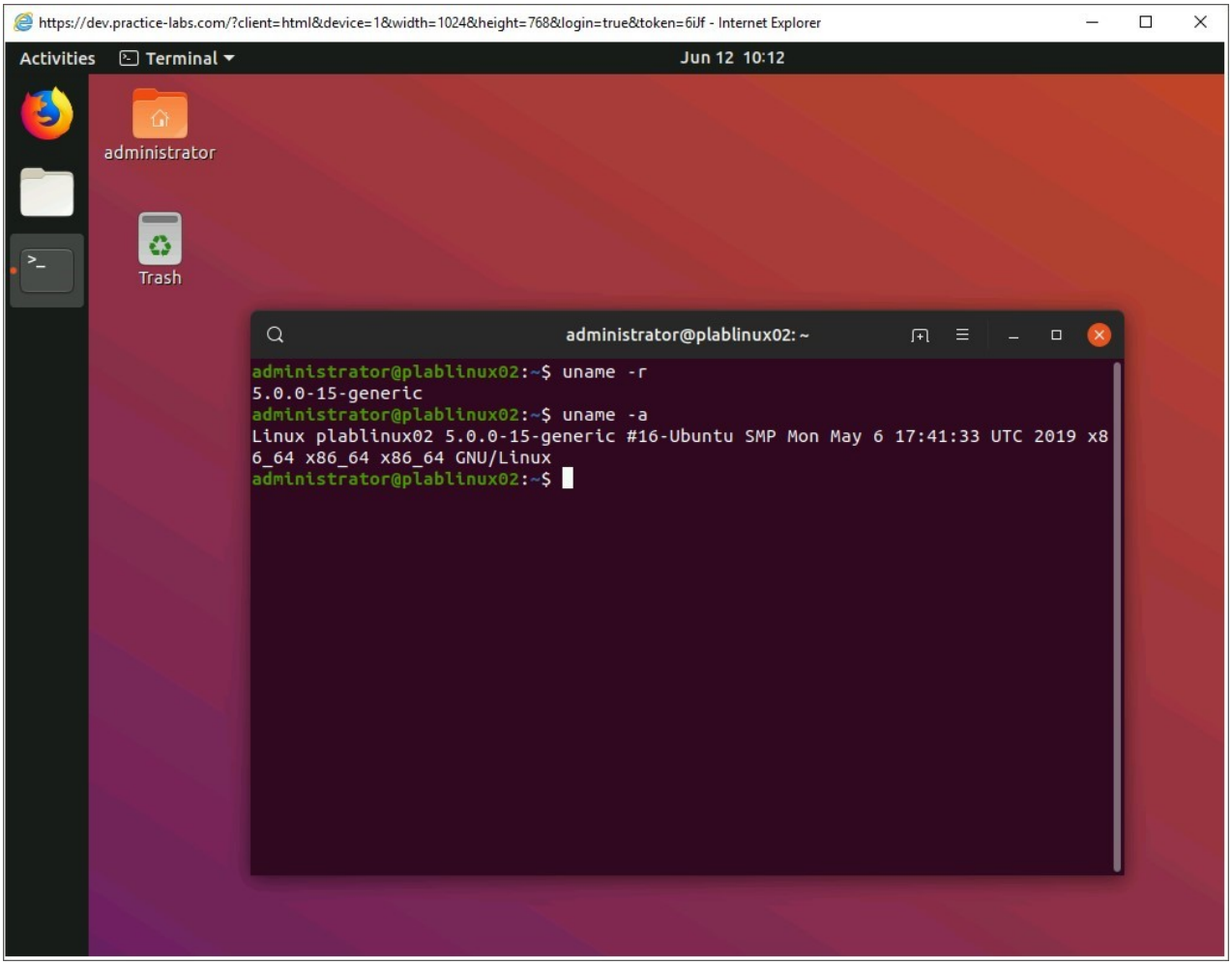


Figure 1.3 Screenshot of PLABLINUX02: Displaying more information about the Linux distribution being used.

Step 4

Clear the screen by entering the following command:

```
clear
```

You can also display the kernel name using the uname command. To do this, type the following command:

```
uname -s
```

Press **Enter**.

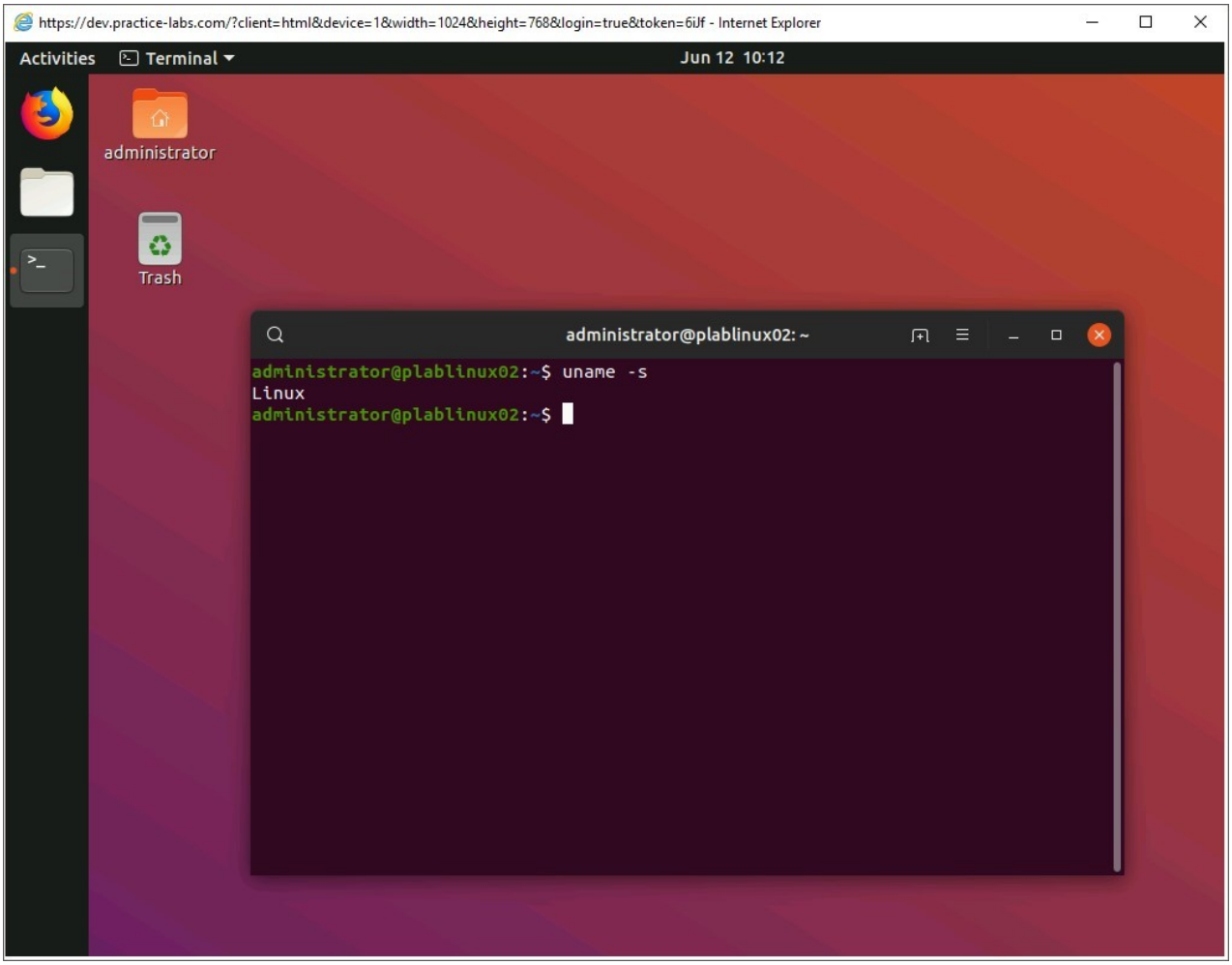


Figure 1.4 Screenshot of PLABLINUX02: Displaying the kernel name.

Step 5

To display the network node hostname of the Linux system, type the following command:

```
uname -n
```

Press **Enter**.

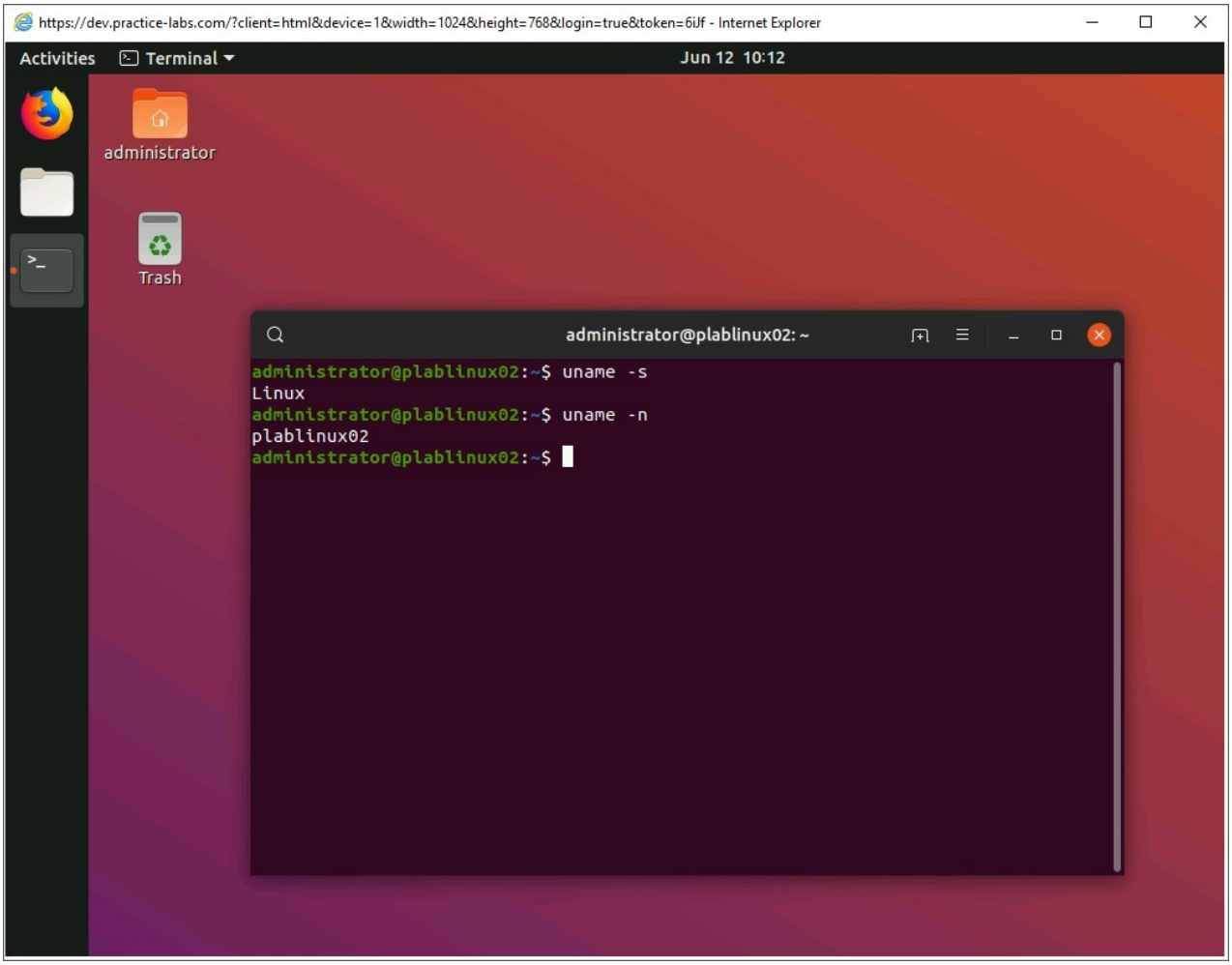


Figure 1.5 Screenshot of PLABLINUX02: Displaying the network node hostname of the Linux system.

Step 6

To display the release date of the kernel, type the following command:

```
uname -v
```

Press **Enter**.

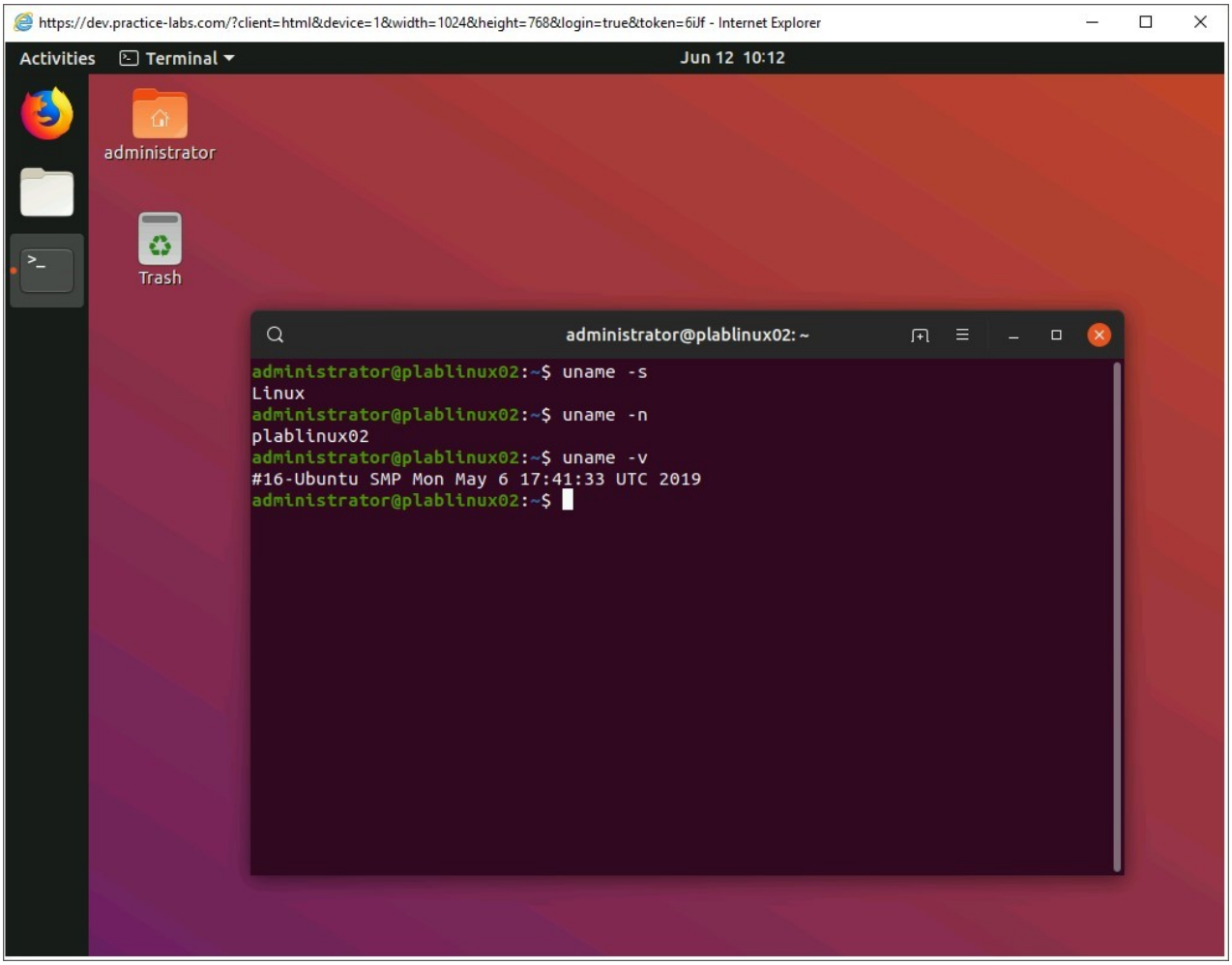


Figure 1.6 Screenshot of PLABLINUX02: Displaying the release date of the kernel.

Step 7

To display the system hardware type, type the following command:

```
uname -m
```

Press **Enter**.

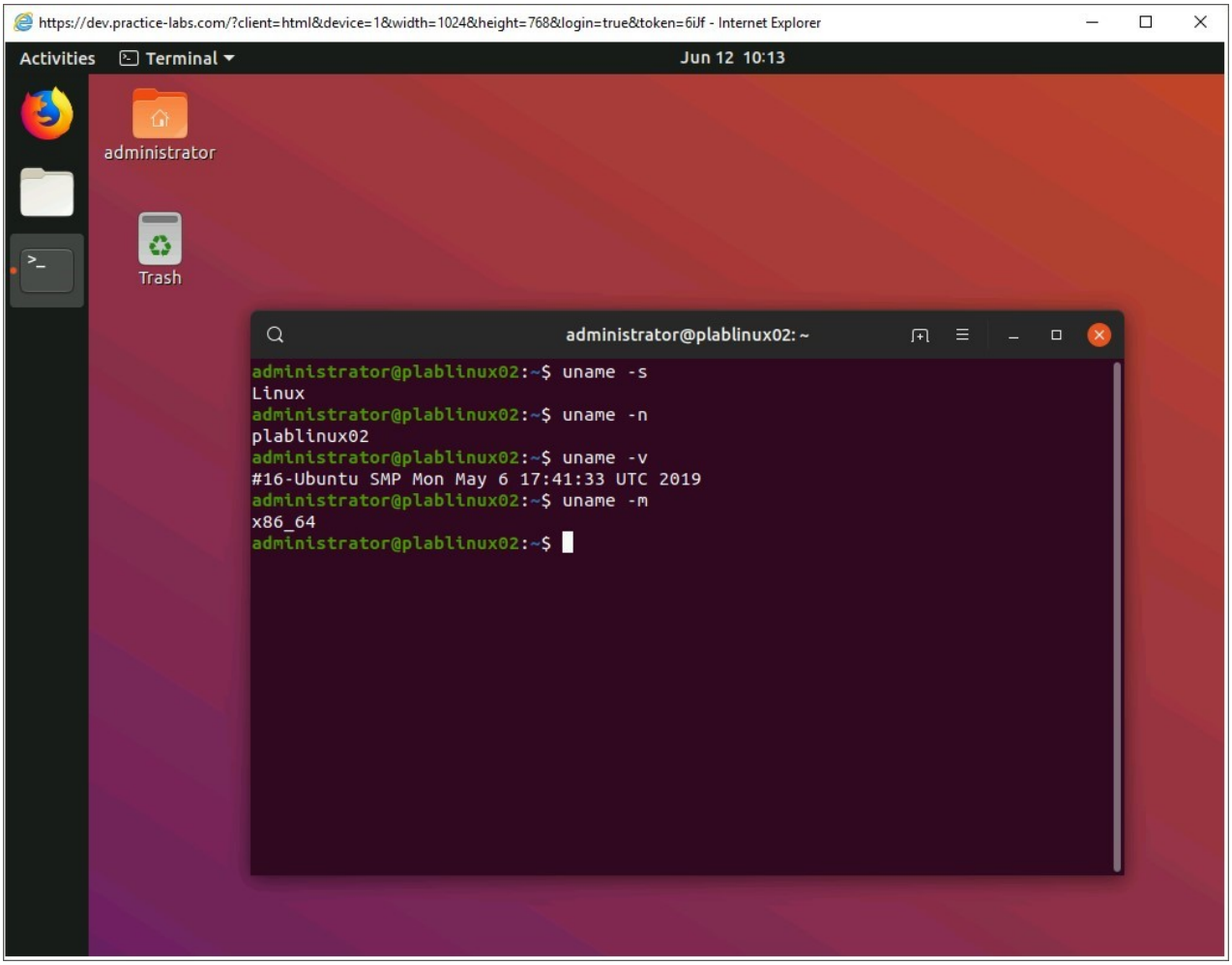


Figure 1.7 Screenshot of PLABLINUX02: Displaying the system hardware type.

Step 8

Clear the screen by entering the following command:

```
clear
```

You can also display the kernel version information from the **/proc/version** file. To do this, type the following command:

```
cat /proc/version
```

Press **Enter**.

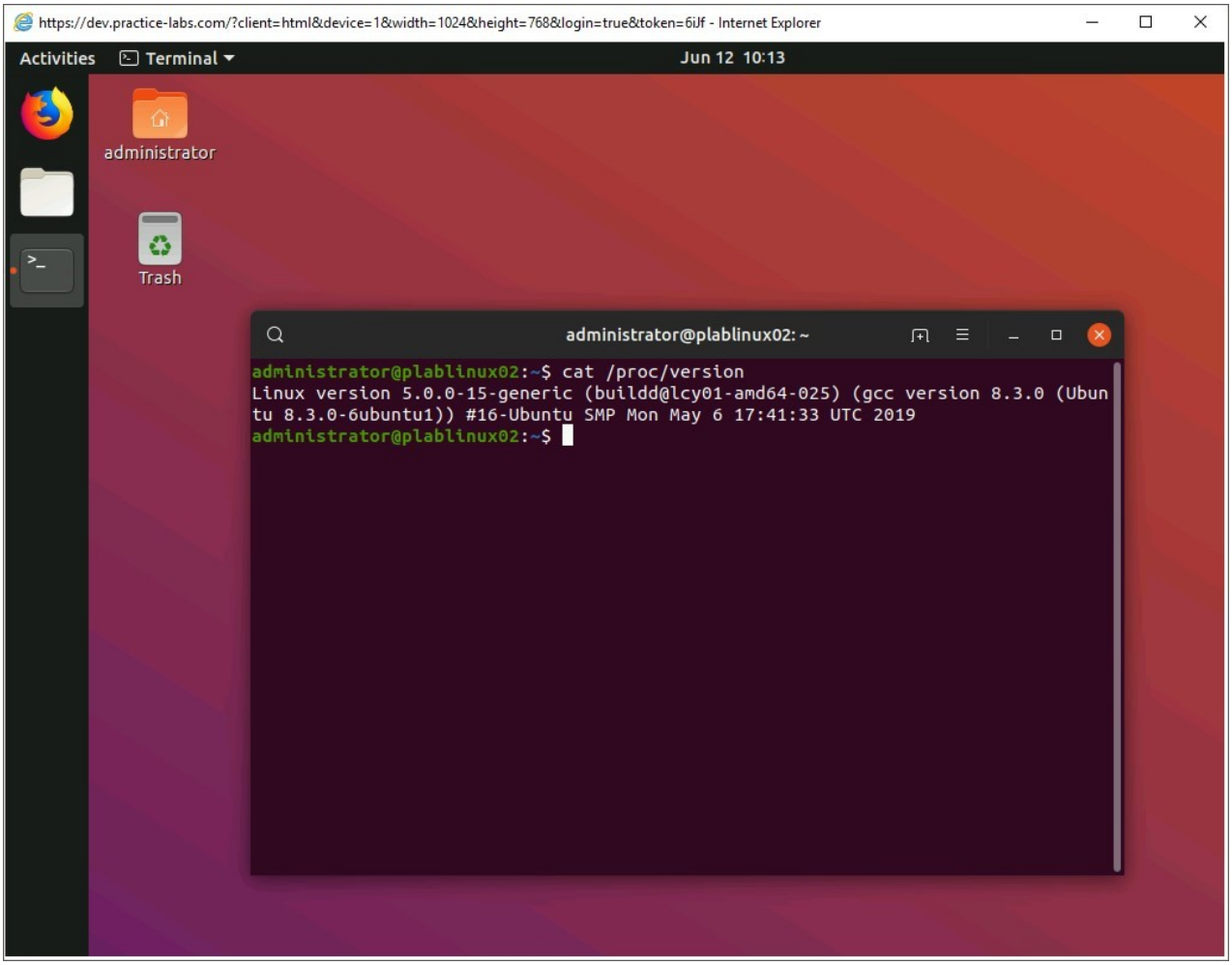


Figure 1.8 Screenshot of PLABLINUX02: Displaying the kernel version information from the /proc/version file.

Step 9

Clear the screen by entering the following command:

```
clear
```

You can also fetch the kernel version information using the dmesg command. To do this, type the following command:

```
dmesg | grep Linux
```

Press **Enter**.

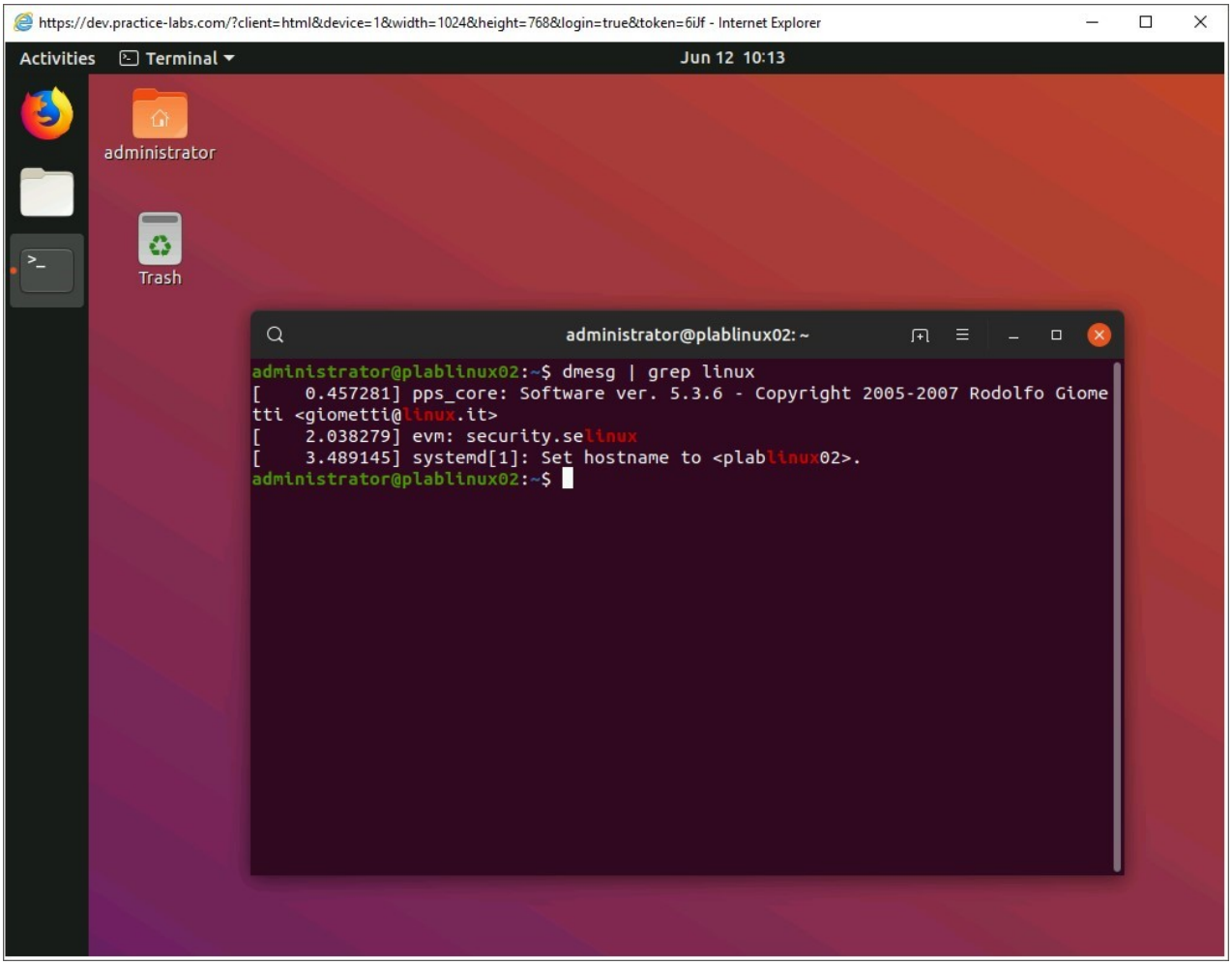


Figure 1.9 Screenshot of PLABLINUX02: Displaying kernel version information using the dmesg command.

Task 2 - Work with Kernel and Module Files

There are various commands that can be used with kernel and module files.

In this task, you will learn to work with kernel and module files.

Step 1

Clear the screen by entering the following command:

```
clear
```

To display all modules loaded in the kernel, type the following command:

```
lsmod
```

Press **Enter**.

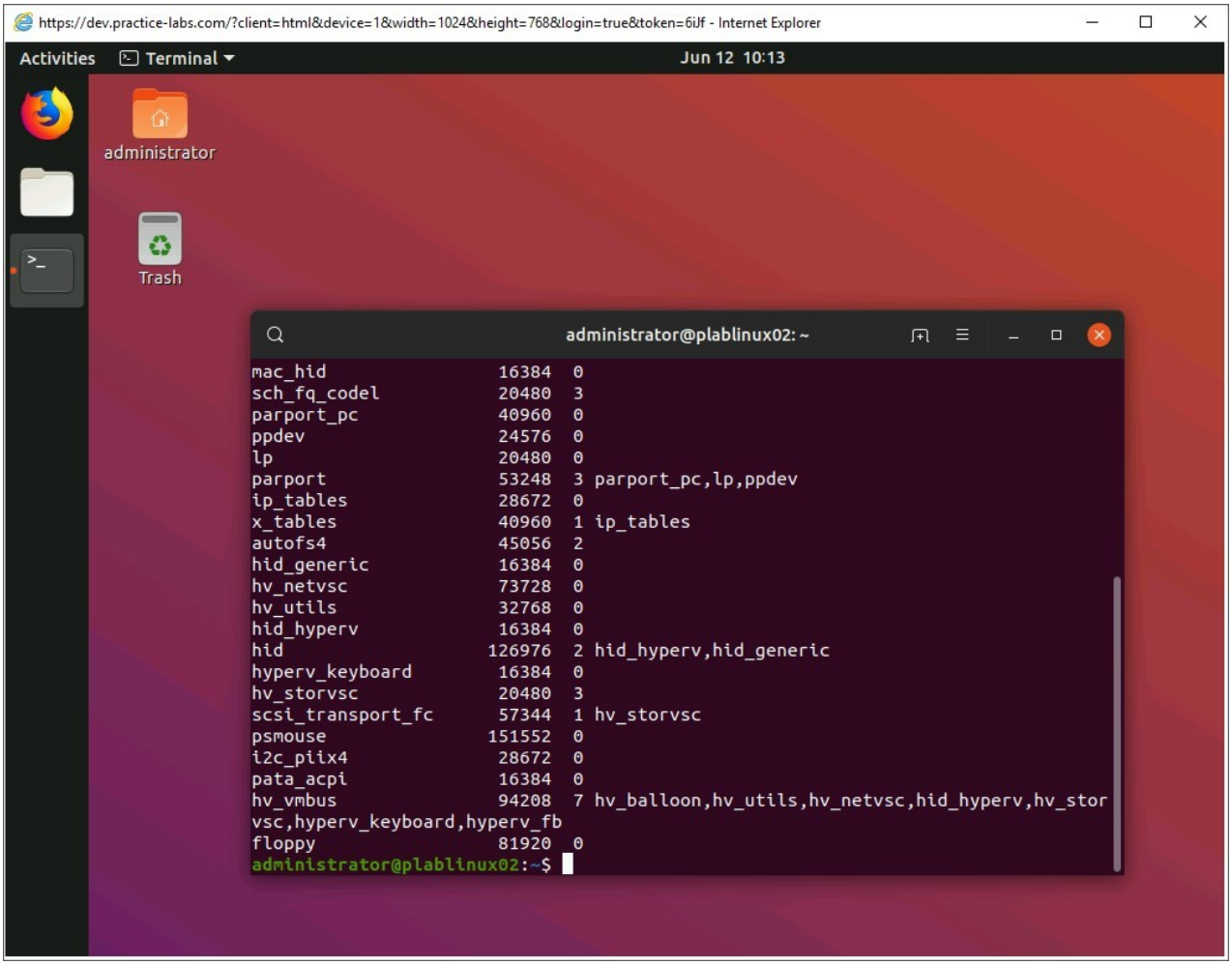


Figure 1.10 Screenshot of PLABLINUX02: Displaying all modules loaded in the kernel.

Step 2

Clear the screen by entering the following command:

```
clear
```

You can also use the lsmod command to view if a specific module is loaded in the kernel. Type the following command:

```
lsmod | grep hid
```

Press **Enter**.

> ***Note:*** *This task uses the hid module to display its information. You can choose any other module that is currently loaded in the kernel. This list is displayed in Step 1.*

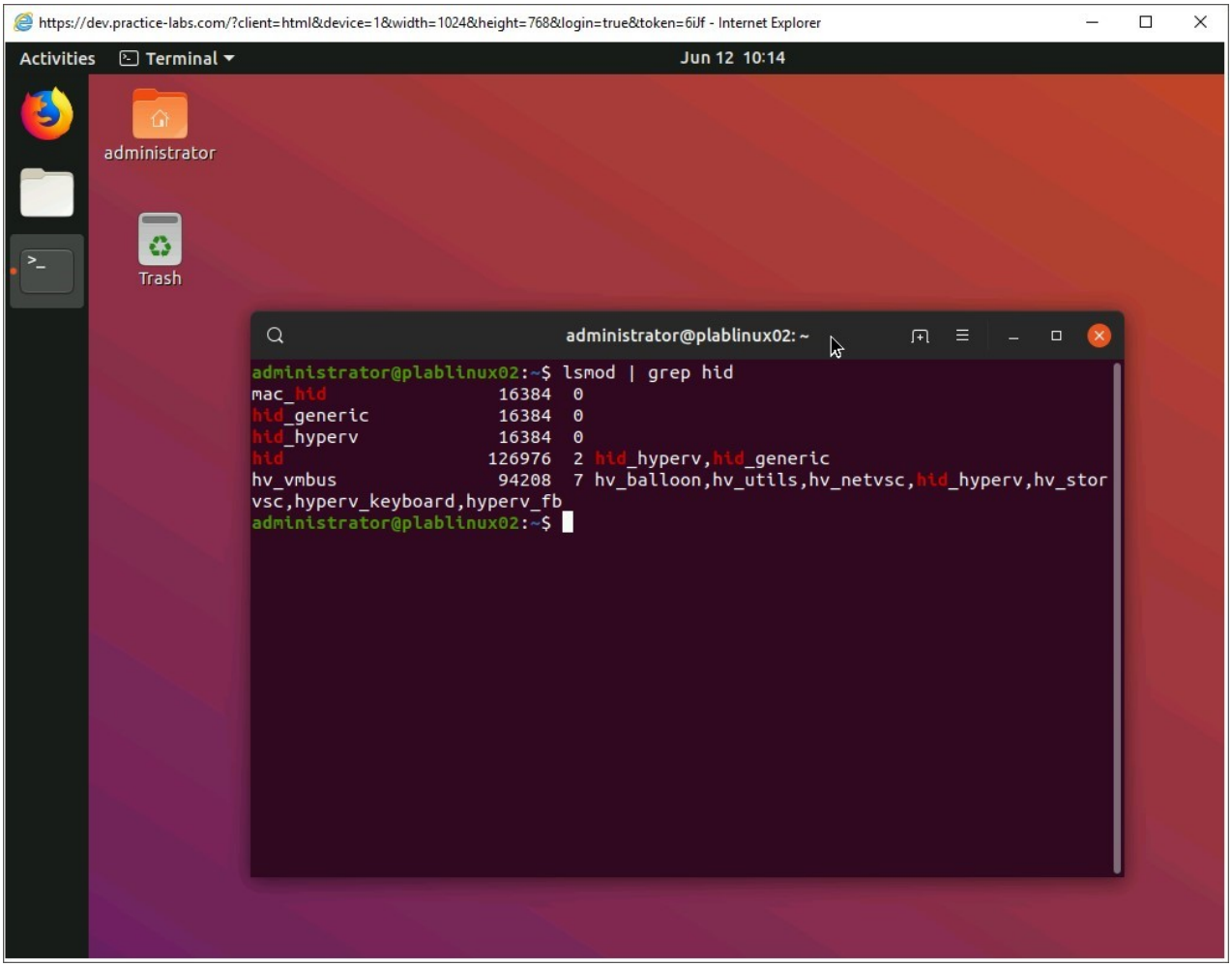


Figure 1.11 Screenshot of PLABLINUX02: Using the lsmod command to view if a specific module is loaded in the kernel.

Step 3

Clear the screen by entering the following command:

```
clear
```

You can display the general information about a particular module using the modinfo command. Type the following command:

```
modinfo -d ip_tables
```

Press **Enter**.

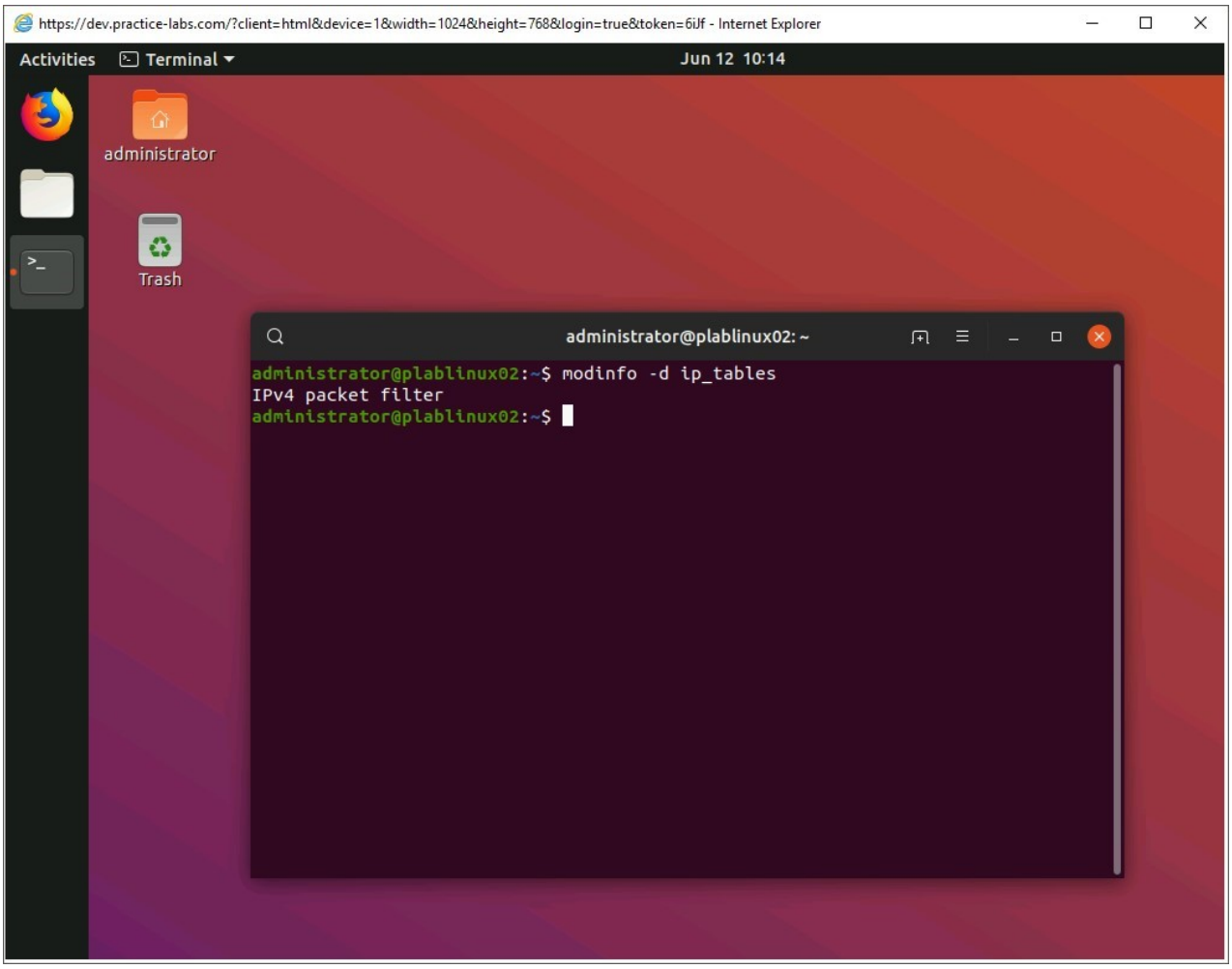


Figure 1.12 Screenshot of PLABLINUX02: Displaying the general information about a particular module using the modinfo command.

Step 4

You can also find the information about the author of a module. Type the following command:

```
modinfo -a ip_tables
```

Press **Enter**.

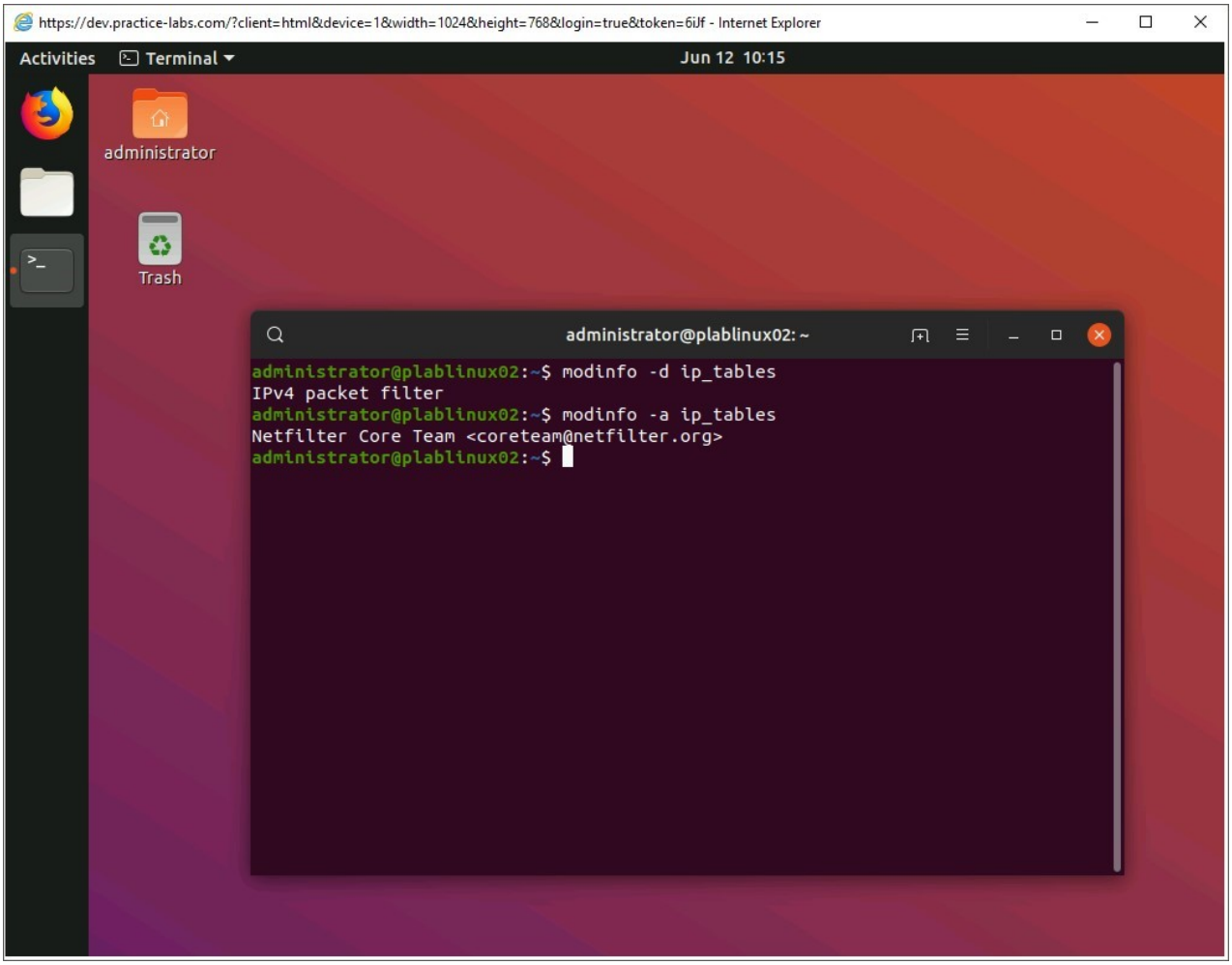


Figure 1.13 Screenshot of PLABLINUX02: Displaying the information about the author of a module.

Step 5

To find the actual location of the module, type the following command:

```
modinfo -n ip_tables
```

Press **Enter**.

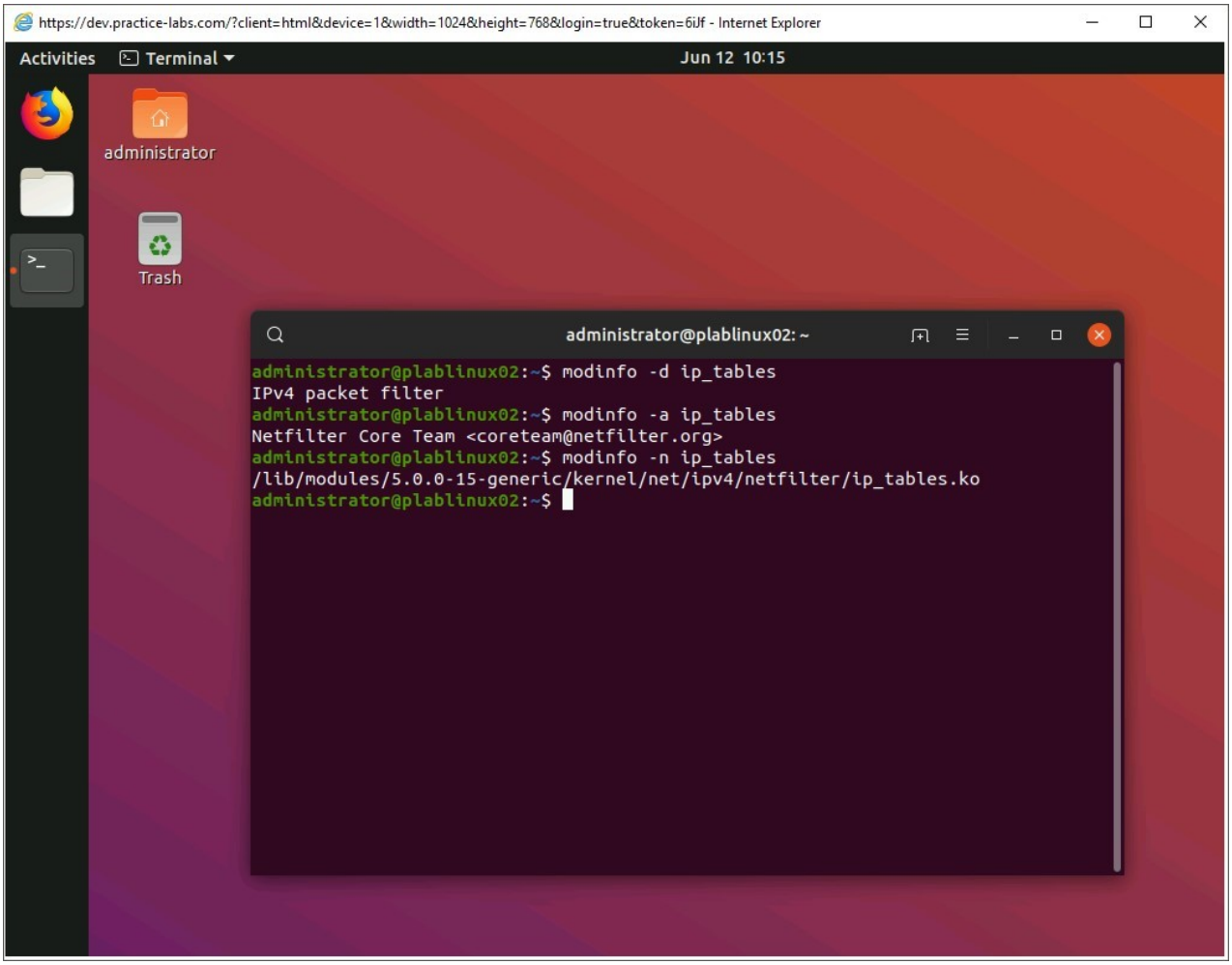


Figure 1.14 Screenshot of PLABLINUX02: Displaying actual location of the module.

Step 6

To find the module dependencies, type the following command:

```
modinfo -F depends ip_tables
```

Press **Enter**.

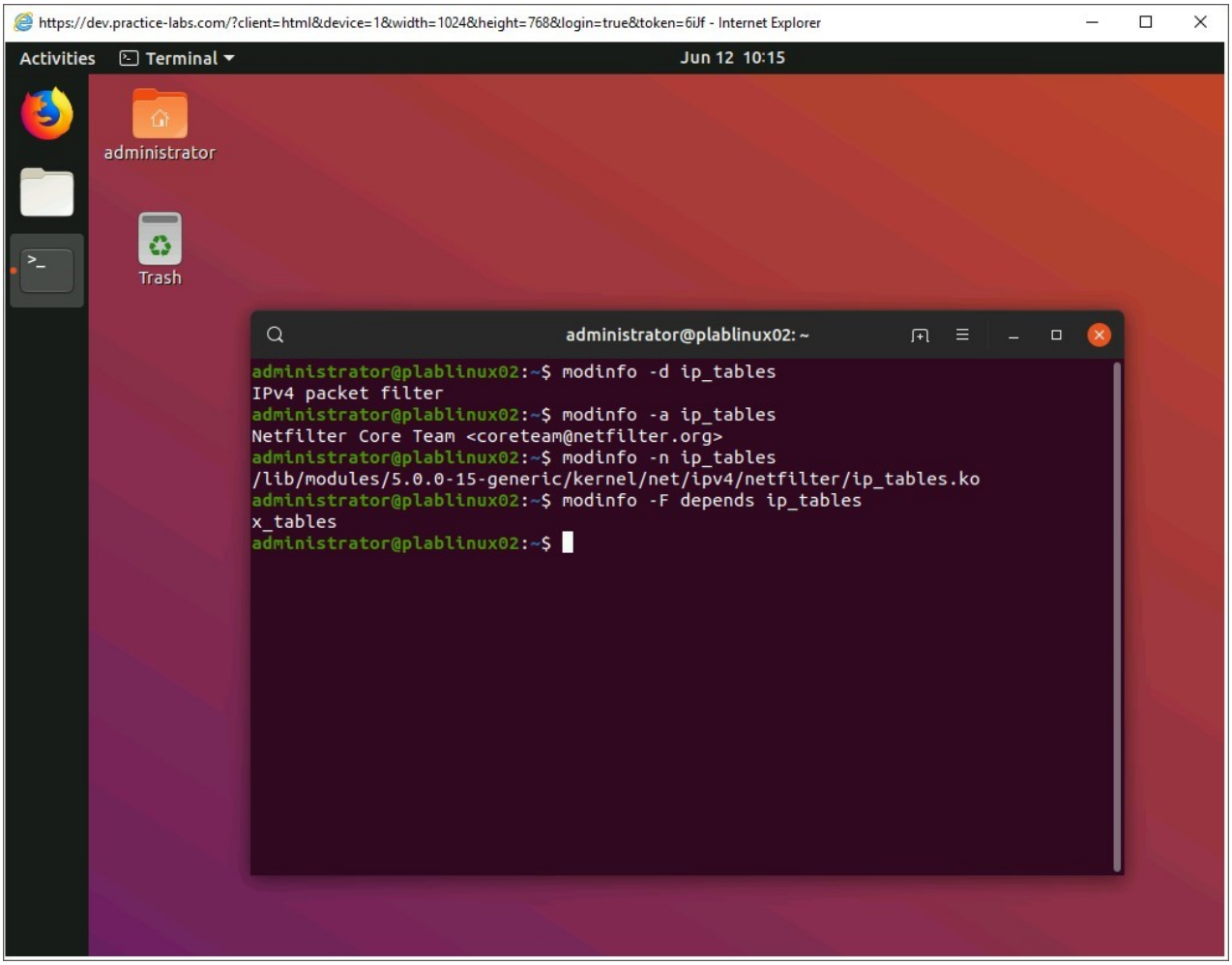


Figure 1.15 Screenshot of PLABLINUX02: Displaying the module dependencies.

Step 7

Clear the screen by entering the following command:

```
clear
```

To display all modules loaded in the kernel, type the following command:

```
lsmod
```

Press **Enter**. In the next step, you will remove **ip_tables**.

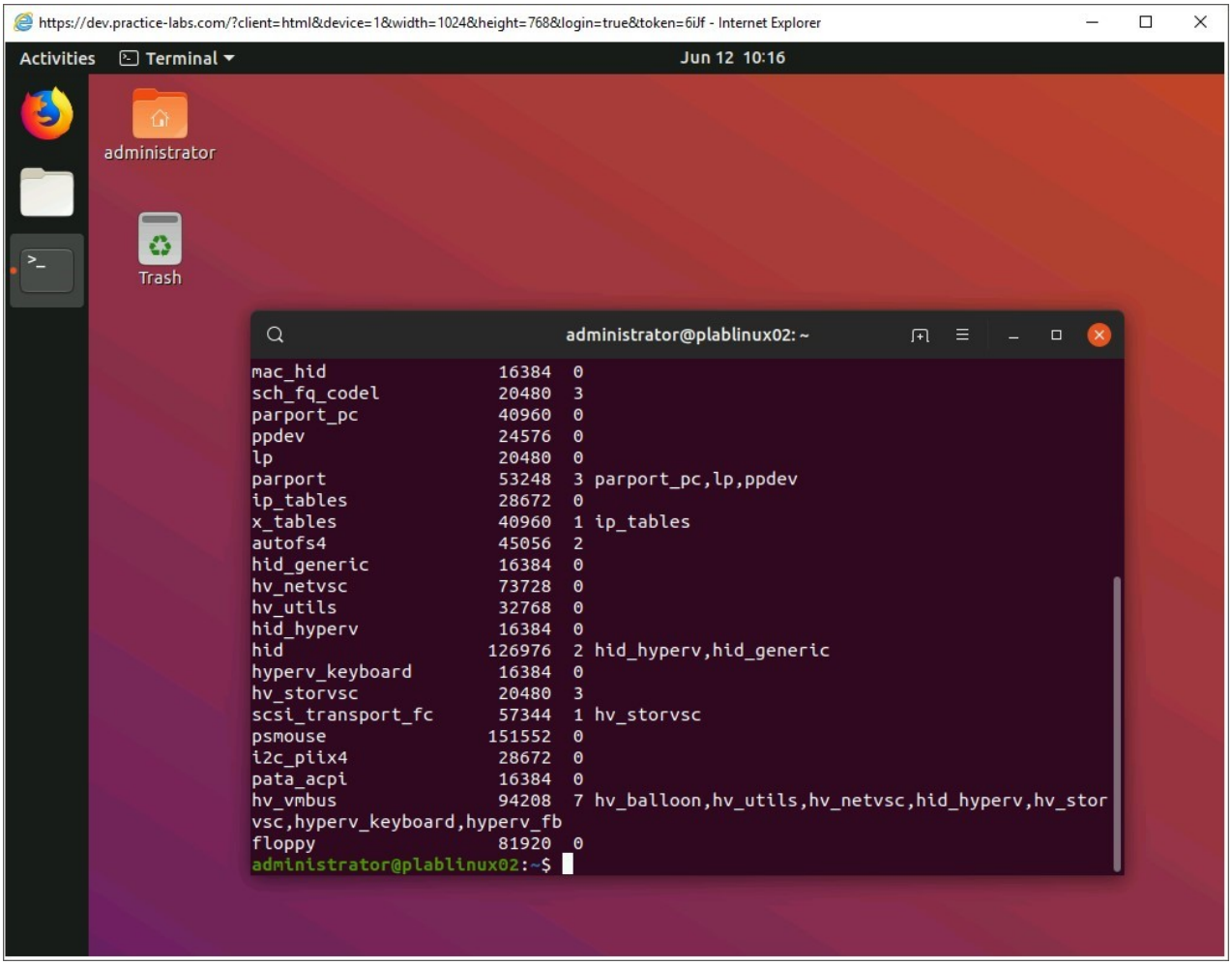


Figure 1.16 Screenshot of PLABLINUX02: Displaying all modules loaded in the kernel.

Step 8

Clear the screen by entering the following command:

```
clear
```

To remove a module loaded in the running kernel, type the following command:

```
sudo rmmod ip_tables
```

Press **Enter**.

Note: If it asks for a password when using the sudo command, enter **`Passw0rd`**.

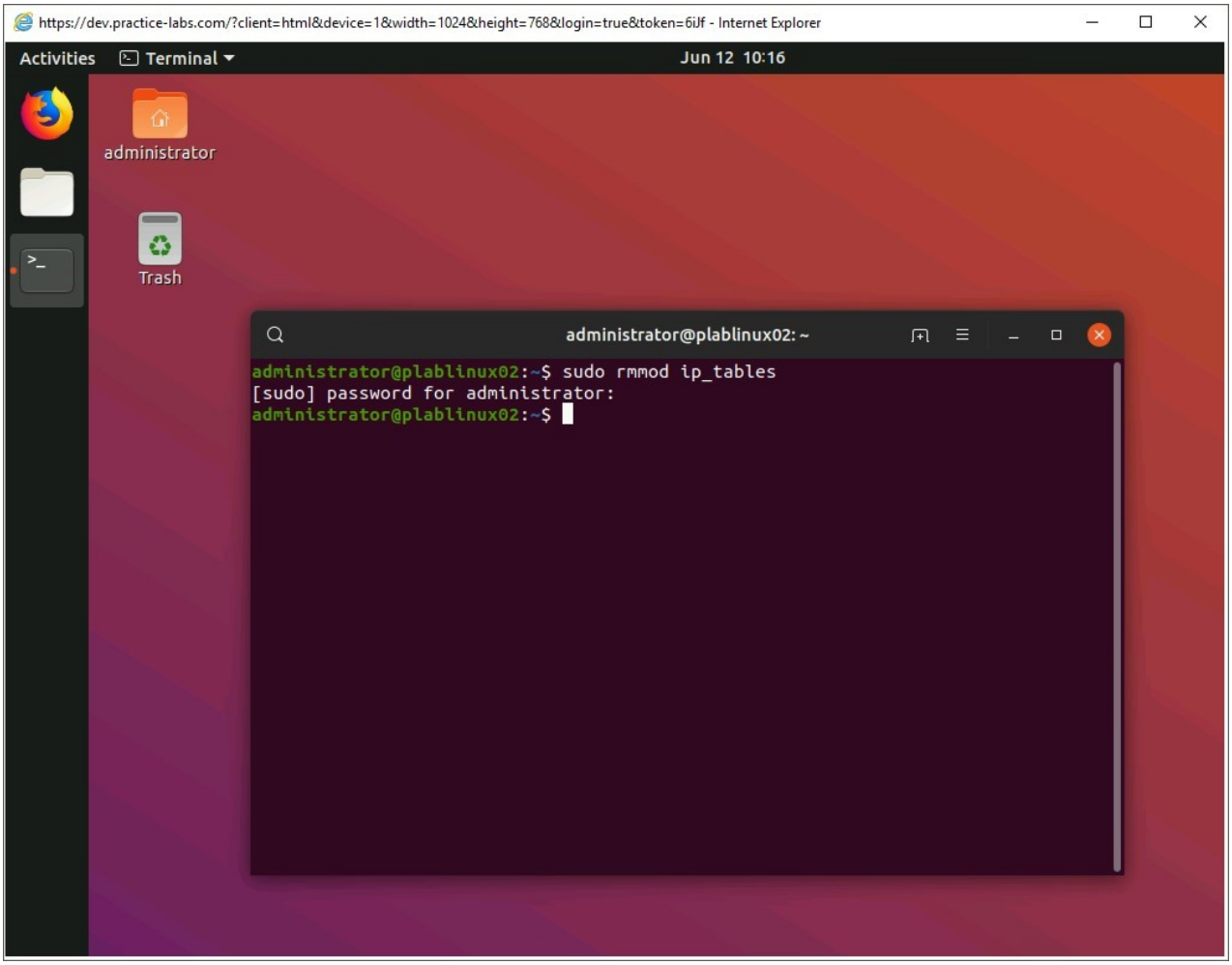


Figure 1.17 Screenshot of PLABLINUX02: Removing a module loaded in the running kernel.

Step 9

Clear the screen by entering the following command:

```
clear
```

Now, display all modules loaded in the kernel, type the following command:

```
lsmod
```

Press **Enter**. You should not find **ip_tables** in the list.

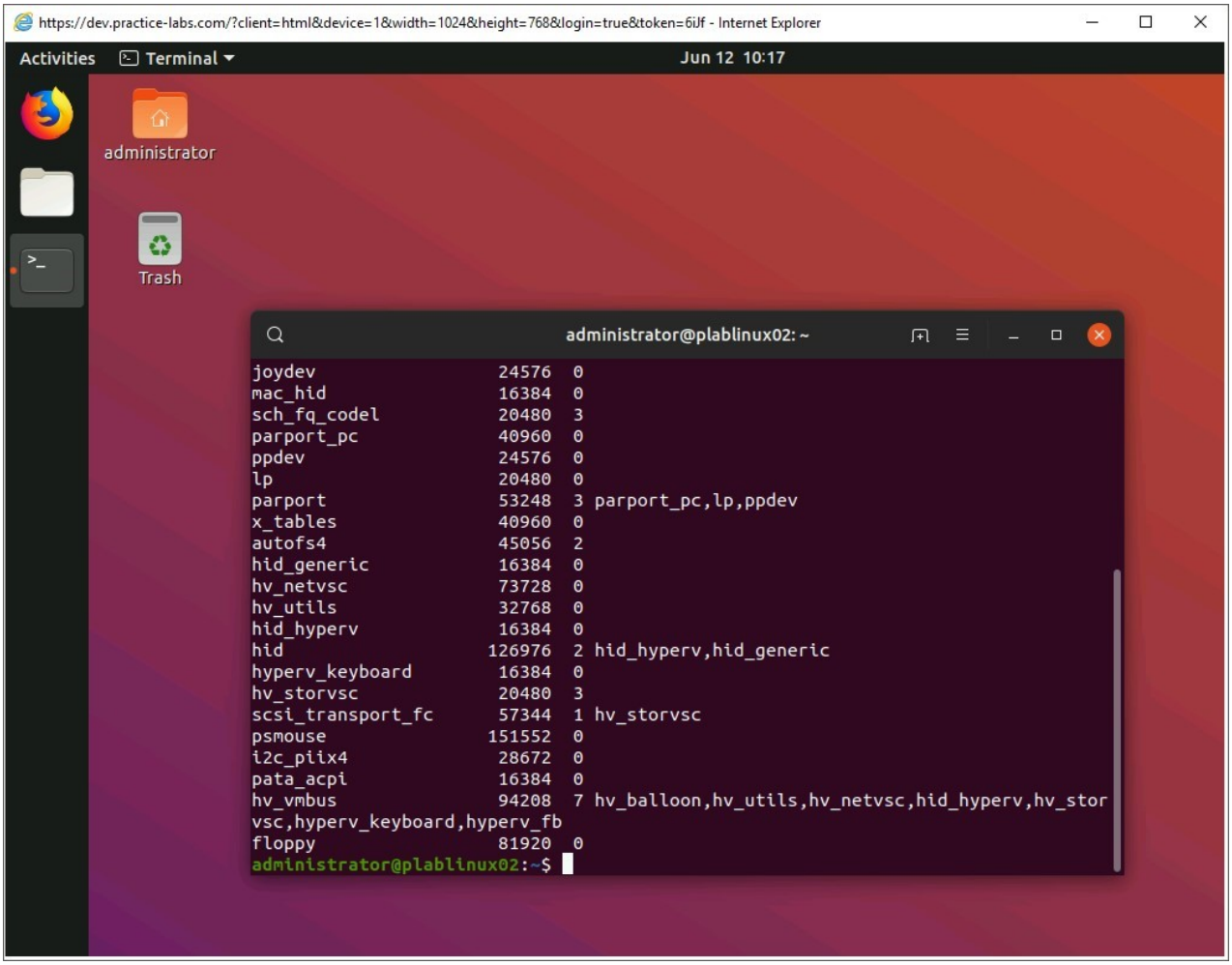


Figure 1.18 Screenshot of PLABLINUX02: Displaying all modules loaded in the kernel.

Step 10

Clear the screen by entering the following command:

```
clear
```

Now, to add the **ip_tables** module in the running kernel, type the following command:

```
sudo modprobe ip_tables
```

Press **Enter**.

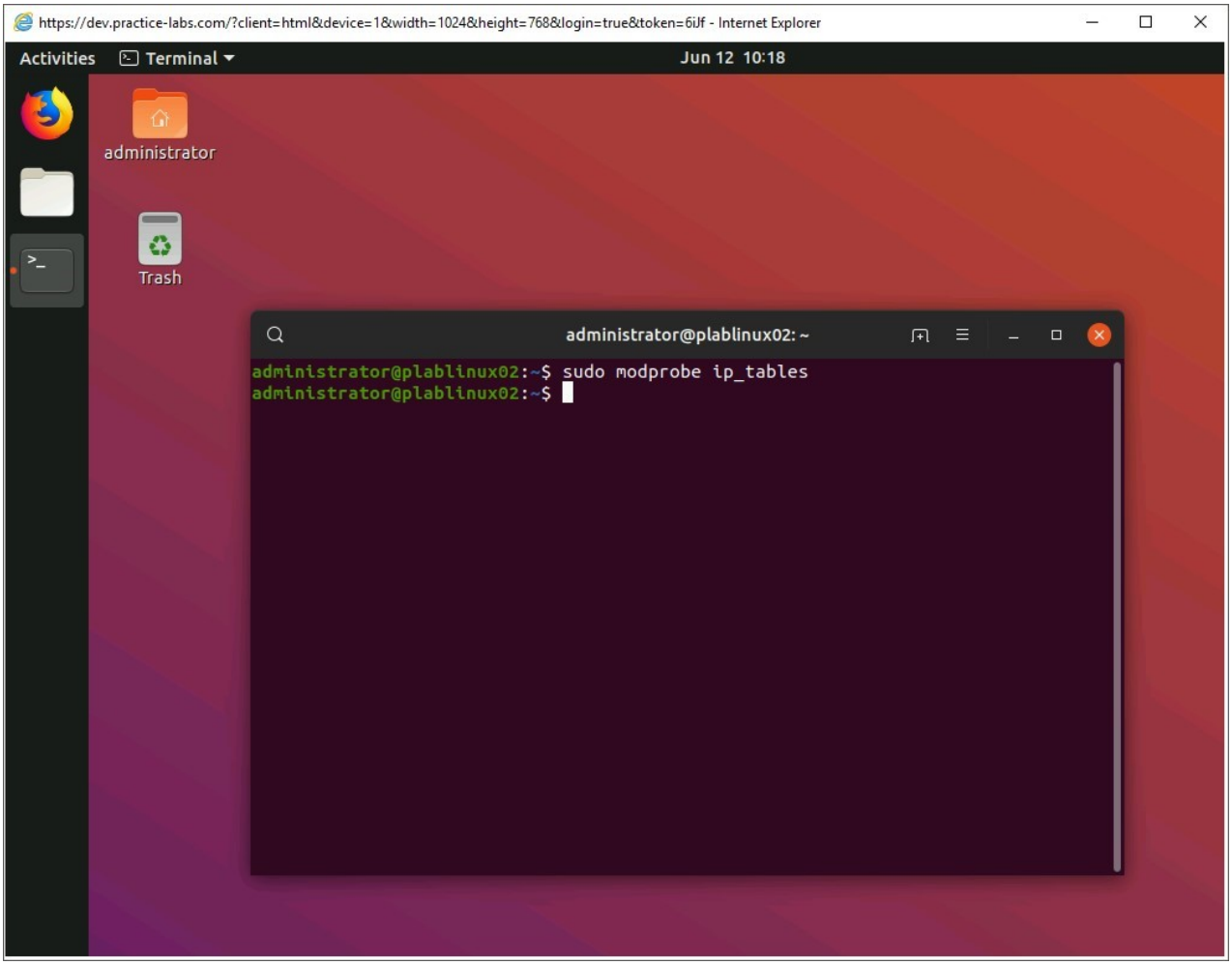


Figure 1.19 Screenshot of PLABLINUX02: Adding the ip_tables module in the running kernel.

Step 11

Now, display all modules loaded in the kernel, type the following command:

```
lsmod
```

Press **Enter**. You should find **ip_tables** on the list.

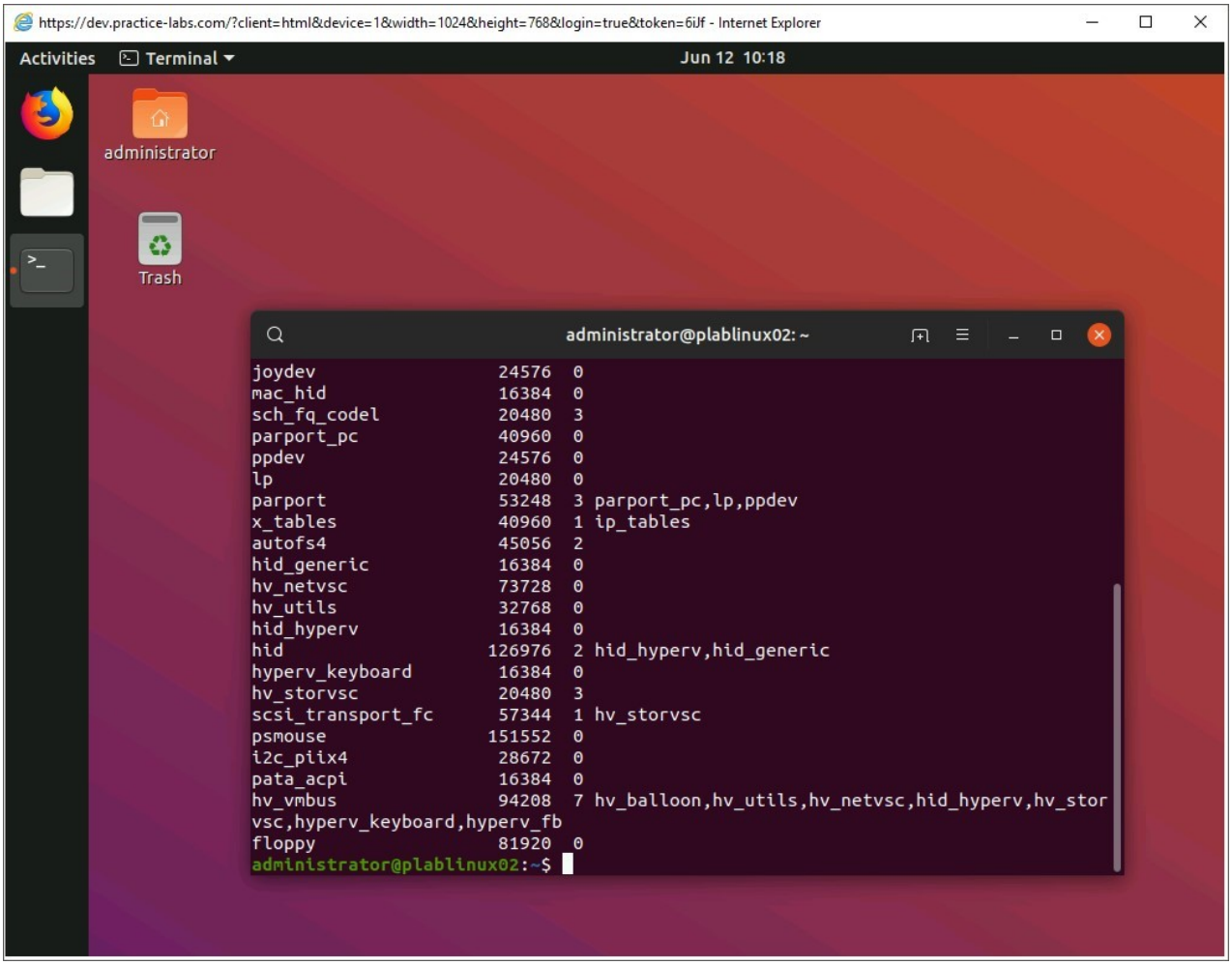


Figure 1.2 Screenshot of PLABLINUX02: Displaying all modules loaded in the kernel.

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

Review

Well done, you have completed the **Working with Kernel, Boot Modules, and Files** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Working with the Kernel Commands

You should now be able to:

- Check Linux Kernel Version
- Work with Kernel and Module Files

Feedback

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