CompTIA Linux+

Using Various Disk Management Tools

- **Introduction**
- **Lab Topology**
- **Exercise 1 - Using Various Disk Management Tools**
- **Review**

Introduction

Welcome to the Using Various Disk Management Tools Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Disk Management
Filesystems
Free Disk Space
Monitor Free Disk

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Using Various Disk Management Tools

After completing this lab, you will be able to:

- View filesystems (lsblk)
- View the content of a block device (blkid)
- Use disk partitioning tools (fdisk, parted)
- Monitor Free Disk Space and Inodes using various commands and utilities

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.

Exercise 1 - Using Various Disk Management Tools

Linux contains various disk management tools, which allow you to monitor information, such as partitions on a disk, the total size of partitions, used and free space on a partition, and type of file system. An administrator should use these tools from time to time to ensure the disk remains health.

In this exercise, you will use various disk management tools.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux system
- View filesystems (lsblk)
- View the content of a block device (blkid)
- Use disk partitioning tools (fdisk, parted)
- Use absolute and relative paths

Task 2 - View filesystems (lsblk)

The lsblk command displays the information about the storage blocks. In the output of this command, the following information is displayed:

- the total size of the partition
- The total size of the block

- The mount points if any available

However, the lsblk command does not provide any information on the used or free disk space.

In this task, you will learn to view filesystems using the lsblk command. 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.

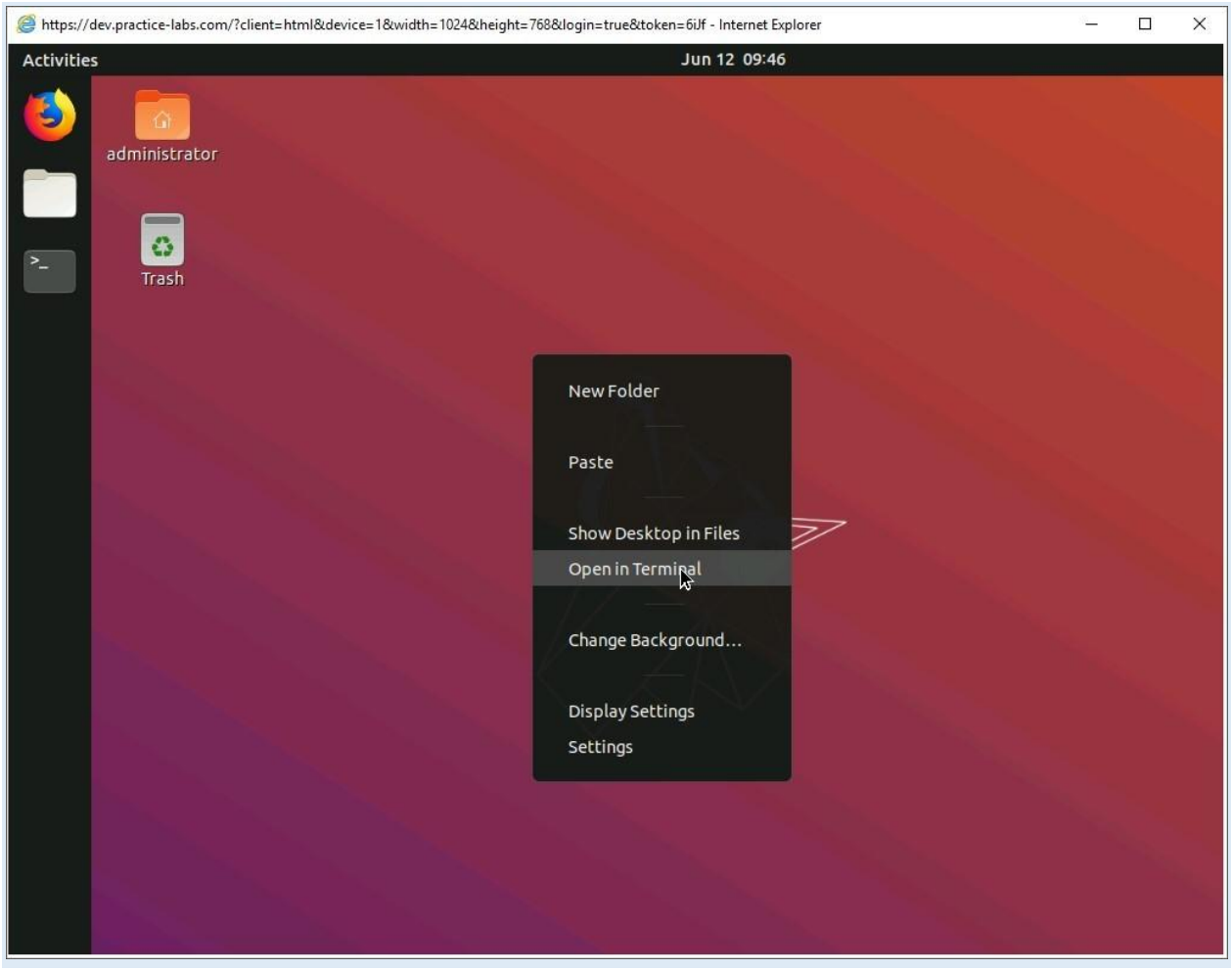

Figure 1.1 Screenshot of PLABLINUX02: Selecting the Open in Terminal option from the context menu.

Step 2

The terminal window is displayed.

To list the devices on the Ubuntu system, type the following command:

```
lsblk
```

Press Enter.

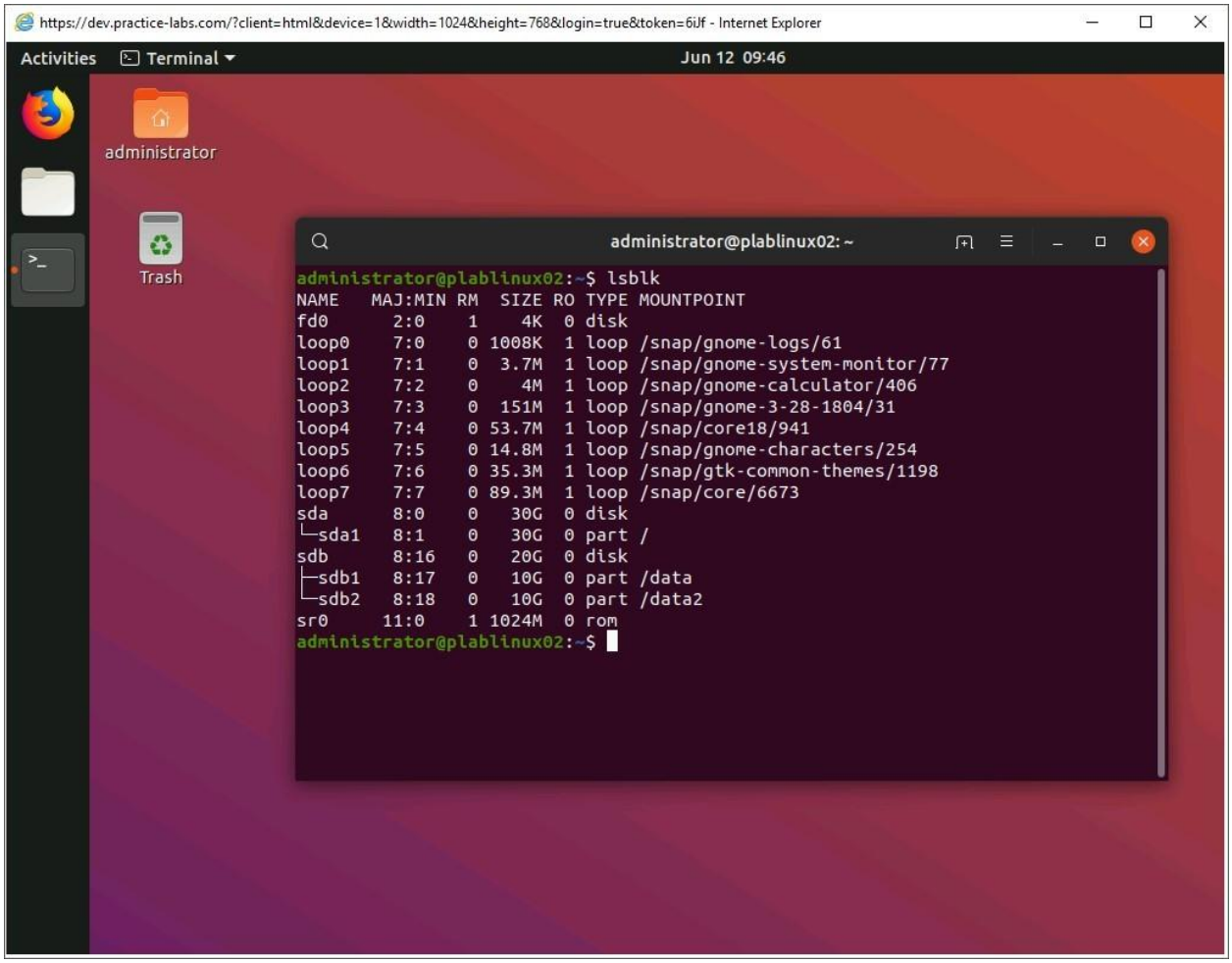

Figure 1.2 Screenshot of PLABLINUX02: Listing the devices on the Ubuntu system.

Step 3

By default, the lsblk command does not include the empty devices in the list. You can, however, list the empty devices as well.

To do this, type the following command:

```
lsblk -a
```

Press Enter.

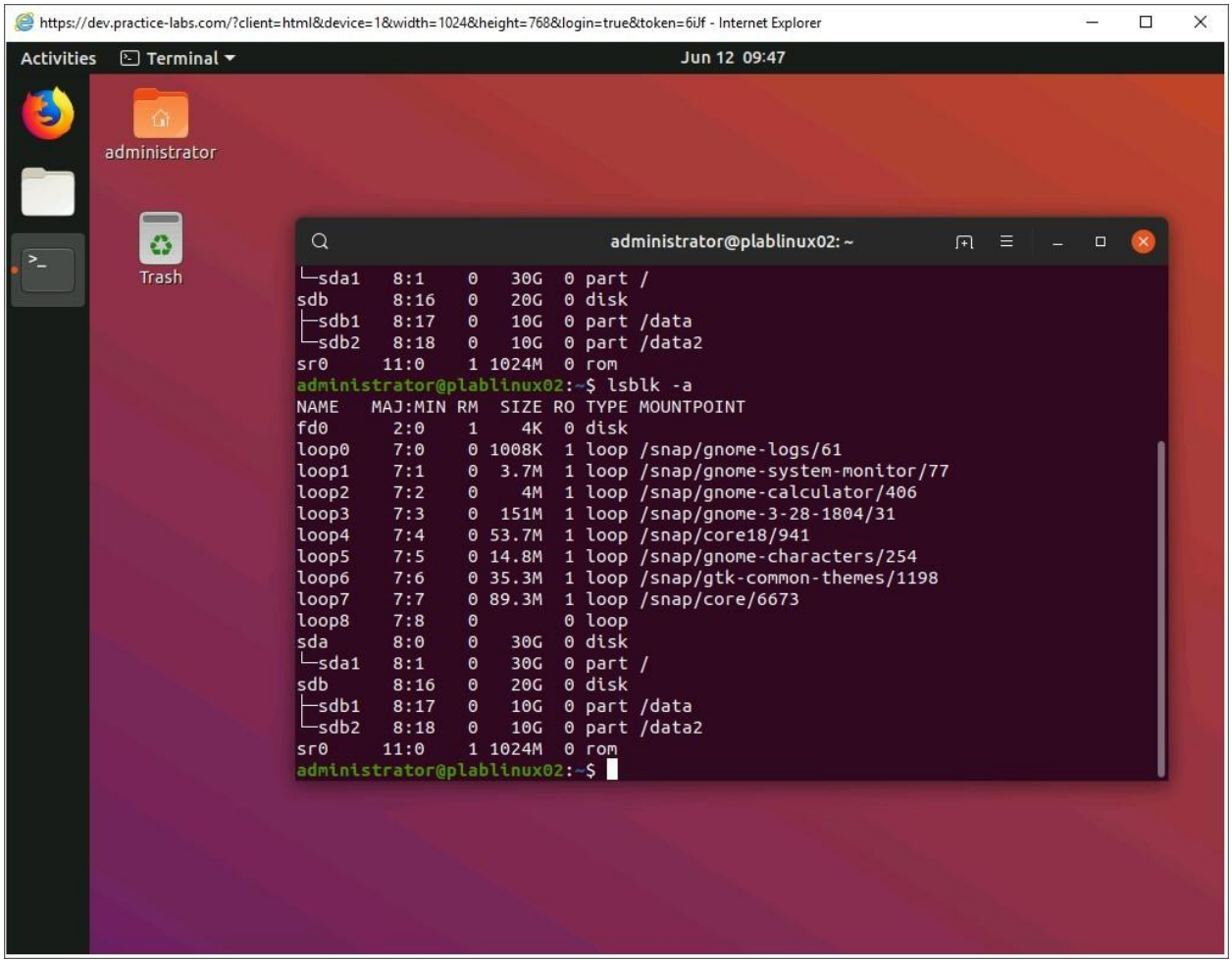

Figure 1.3 Screenshot of PLABLINUX02: Listing the devices along with the empty devices on the Ubuntu system.

Step 4

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can also list the device size in bytes. To do this, type the following command:

```
lsblk -b
```

Press Enter.

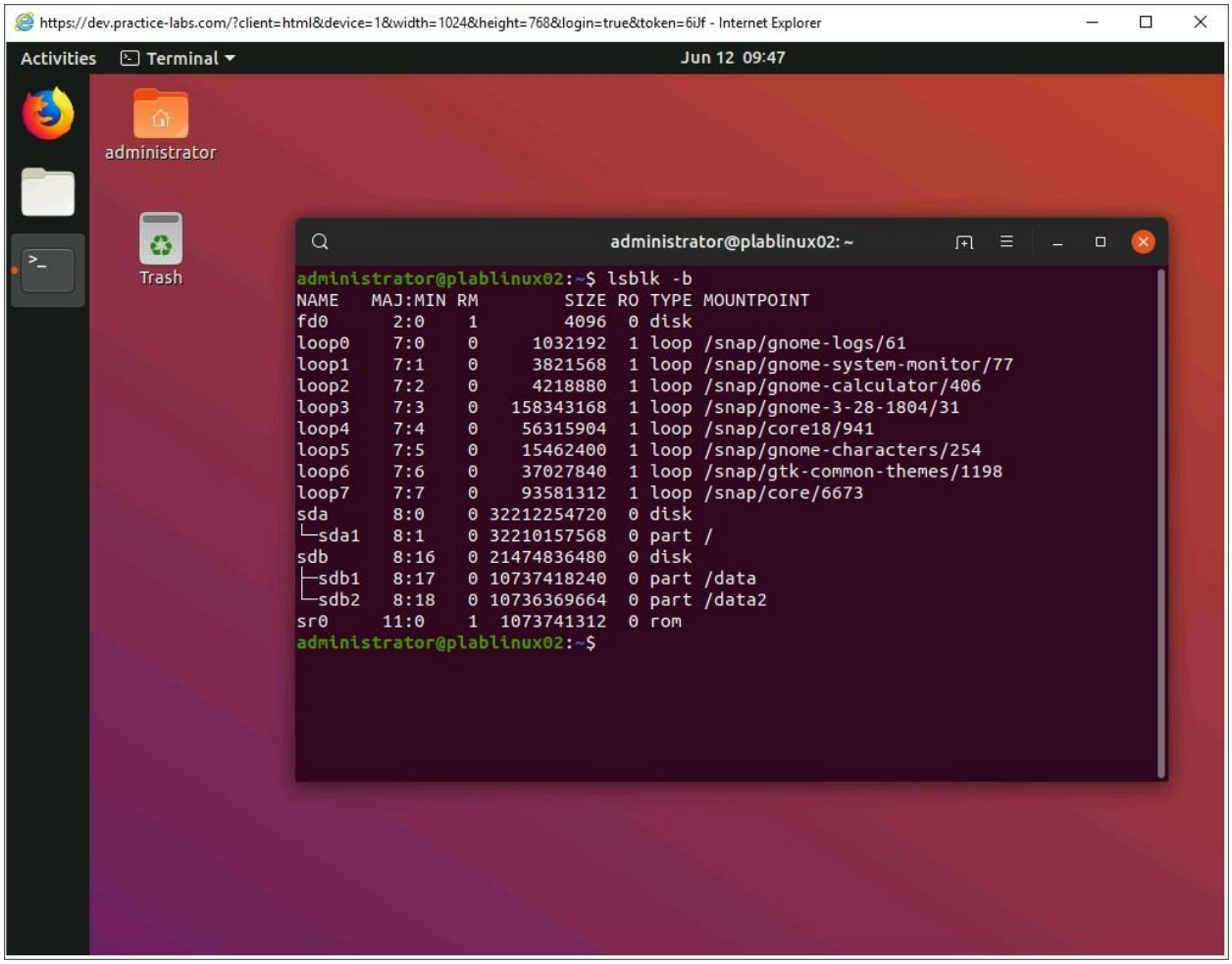

Figure 1.4 Screenshot of PLABLINUX02: Listing the device size in bytes.

Step 5

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can also list only the main devices and skip the slave device. For example, you can list /dev/sdb but not /dev/sdb1 and /dev/sdb2. To do this, type the following command:

```
lsblk -d
```

Press Enter.

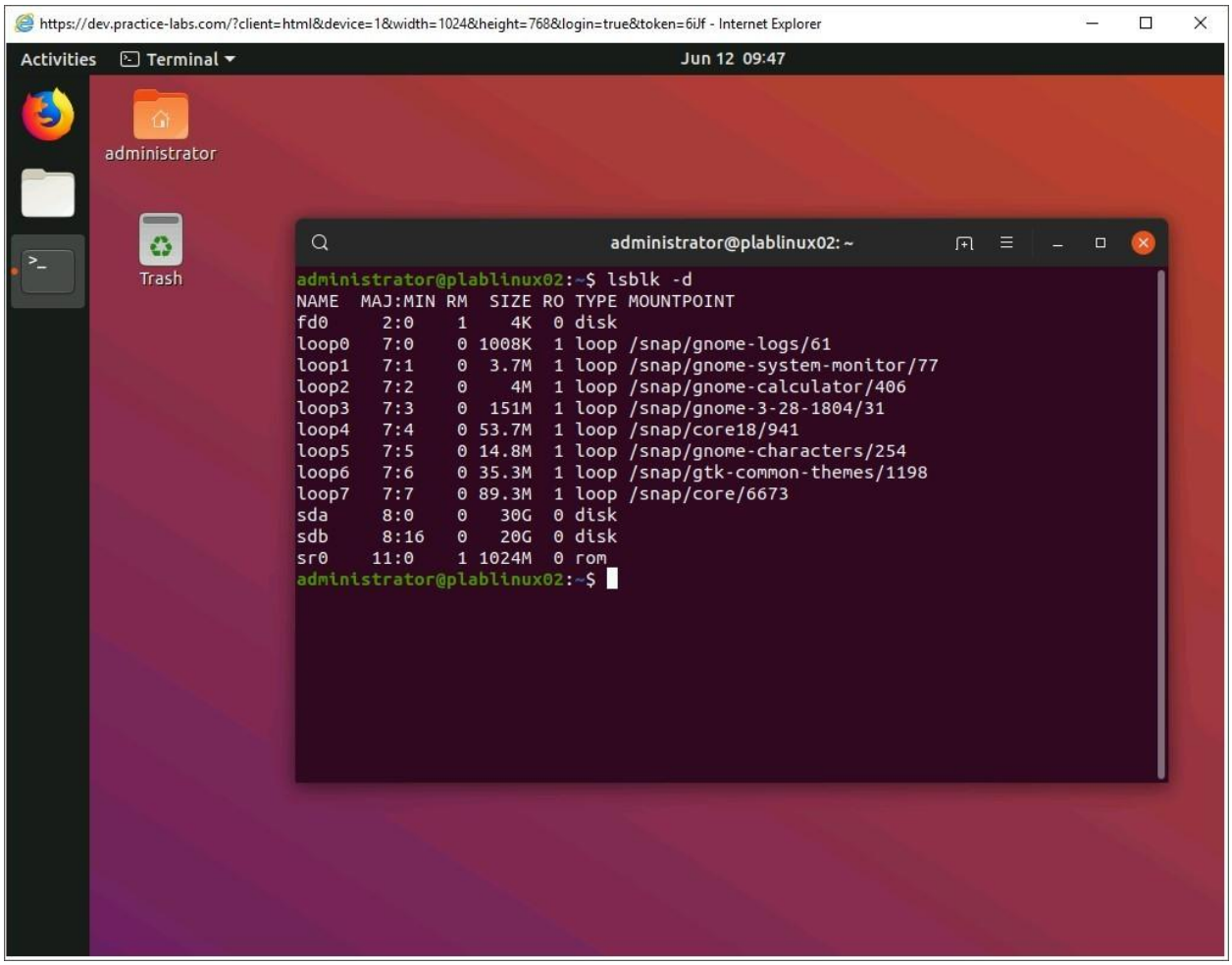

Figure 1.5 Screenshot of PLABLINUX02: Listing only the main devices and skipping the slave device.

Step 6

Using the lsblk command, you can also display the information about the device owner, group, and mode. To do this, type the following command:

```
lsblk -m
```

Press Enter.

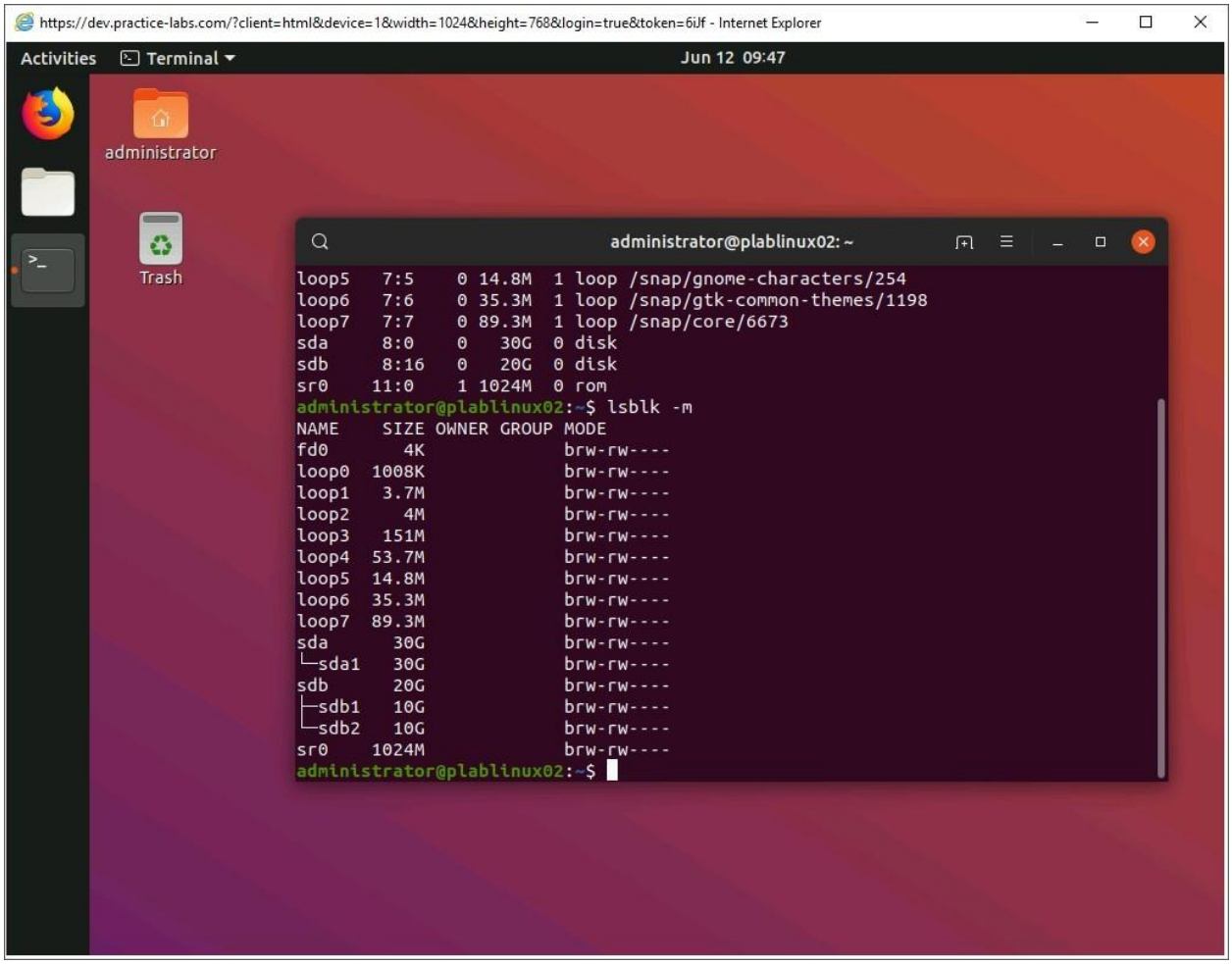

Figure 1.6 Screenshot of PLABLINUX02: Displaying the information about device owner, group, and mode.

Step 7

Clear the screen by entering the following command:

```
clear
```

Press Enter. Instead of displaying all columns, you can choose to display only the selected columns. To do this, type the following command:

```
lsblk -o NAME,SIZE
```

Press Enter.

Note: If you provide space between NAME and SIZE, you will receive an error. There should not be any space after the comma.

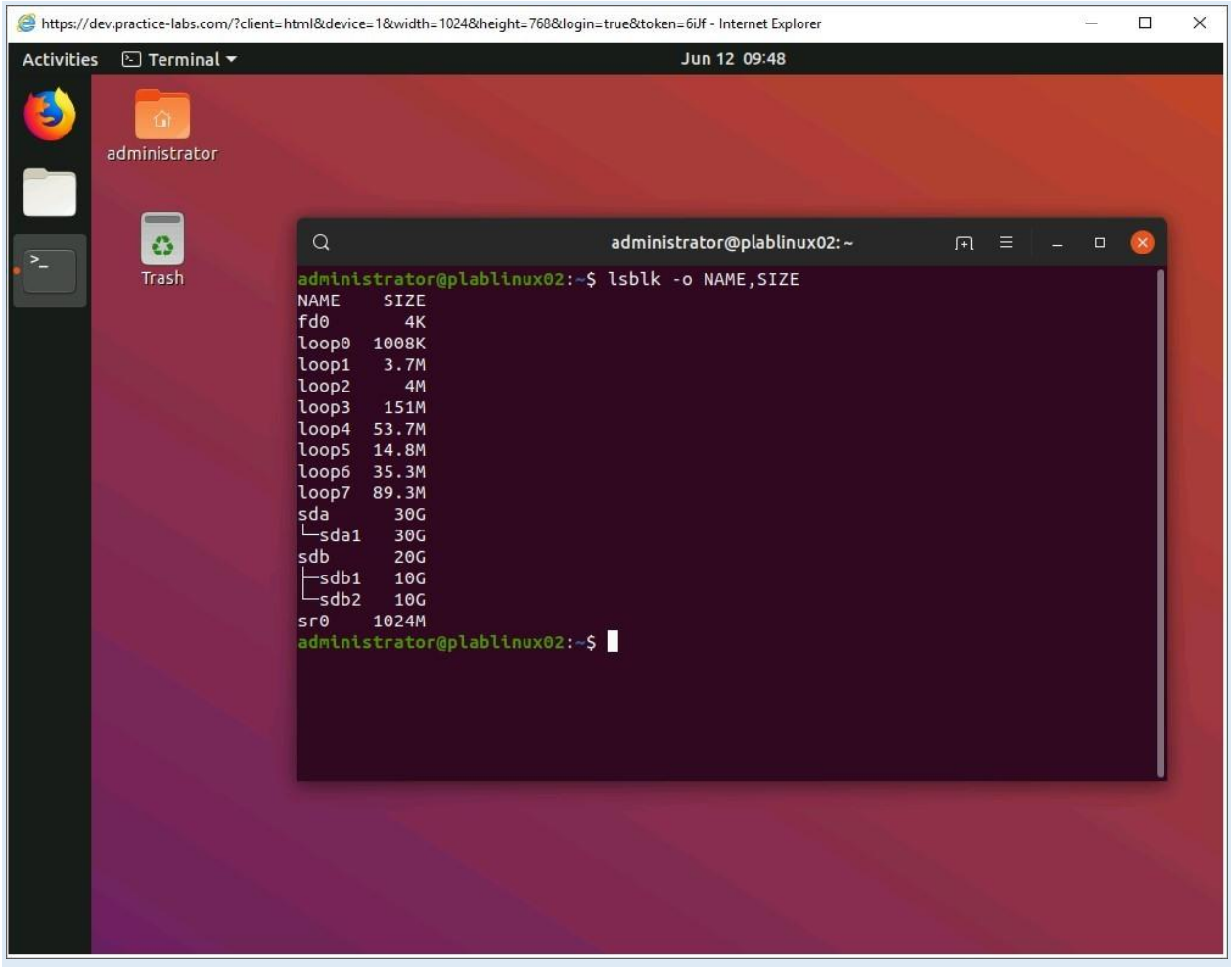

Figure 1.7 Screenshot of PLABLINUX02: Displaying only the selected columns with the lsblk command.

Task 3 - View the content of a block device (blkid)

Using the blkid command, you can view the attributes of the block devices.

In this task, you will learn to differentiate between the absolute and relative paths.

Step 1

Clear the screen by entering the following command:

```
clear
```

Press Enter. To display all the block devices on a Linux system, type the following command:

```
sudo blkid
```

If prompted, type the following password:

`Passw0rd`

Press Enter.

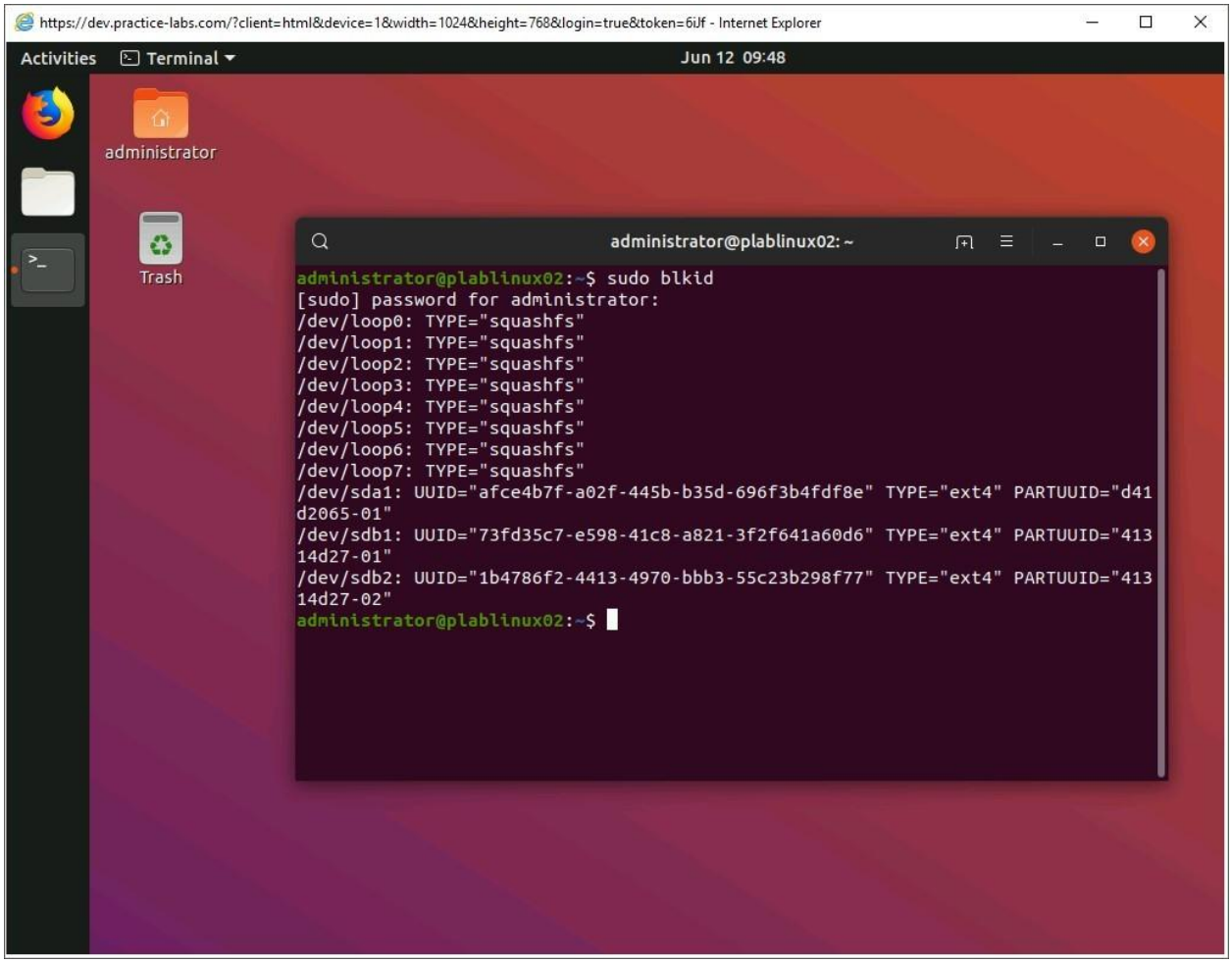

Figure 1.8 Screenshot of PLABLINUX02: Displaying all the block devices on a Linux system.

Step 2

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can use the -i parameter to display the I/O limits on a specific block device. Type the following command:

```
sudo blkid -i /dev/sdb1
```

Press Enter.

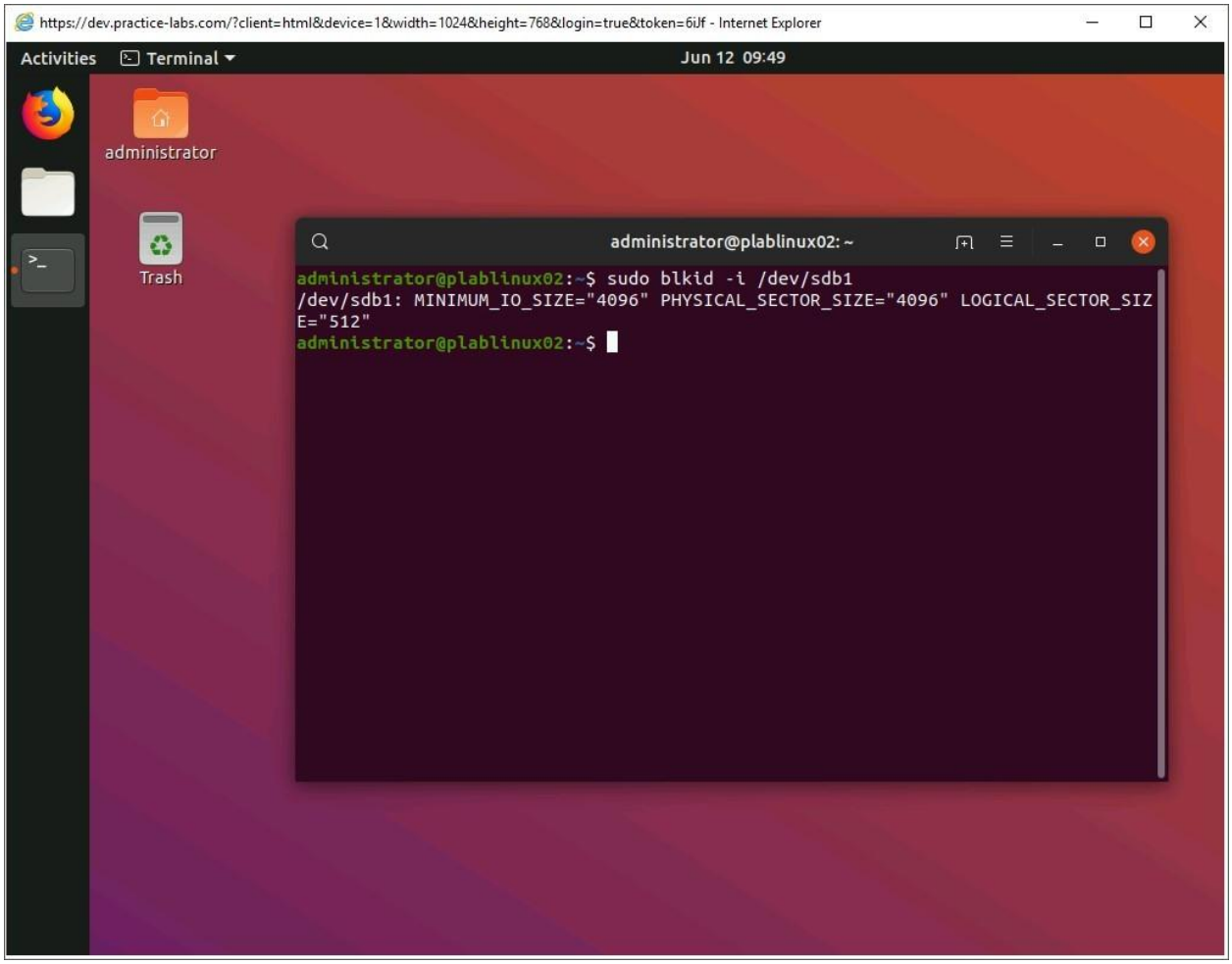

Figure 1.9 Screenshot of PLABLINUX02: Displaying the I/O limits on a specific block device.

Step 3

You can use the -p parameter to display additional information on a specific block device. Type the following command:

```
sudo blkid -p /dev/sdb1
```

Press Enter.

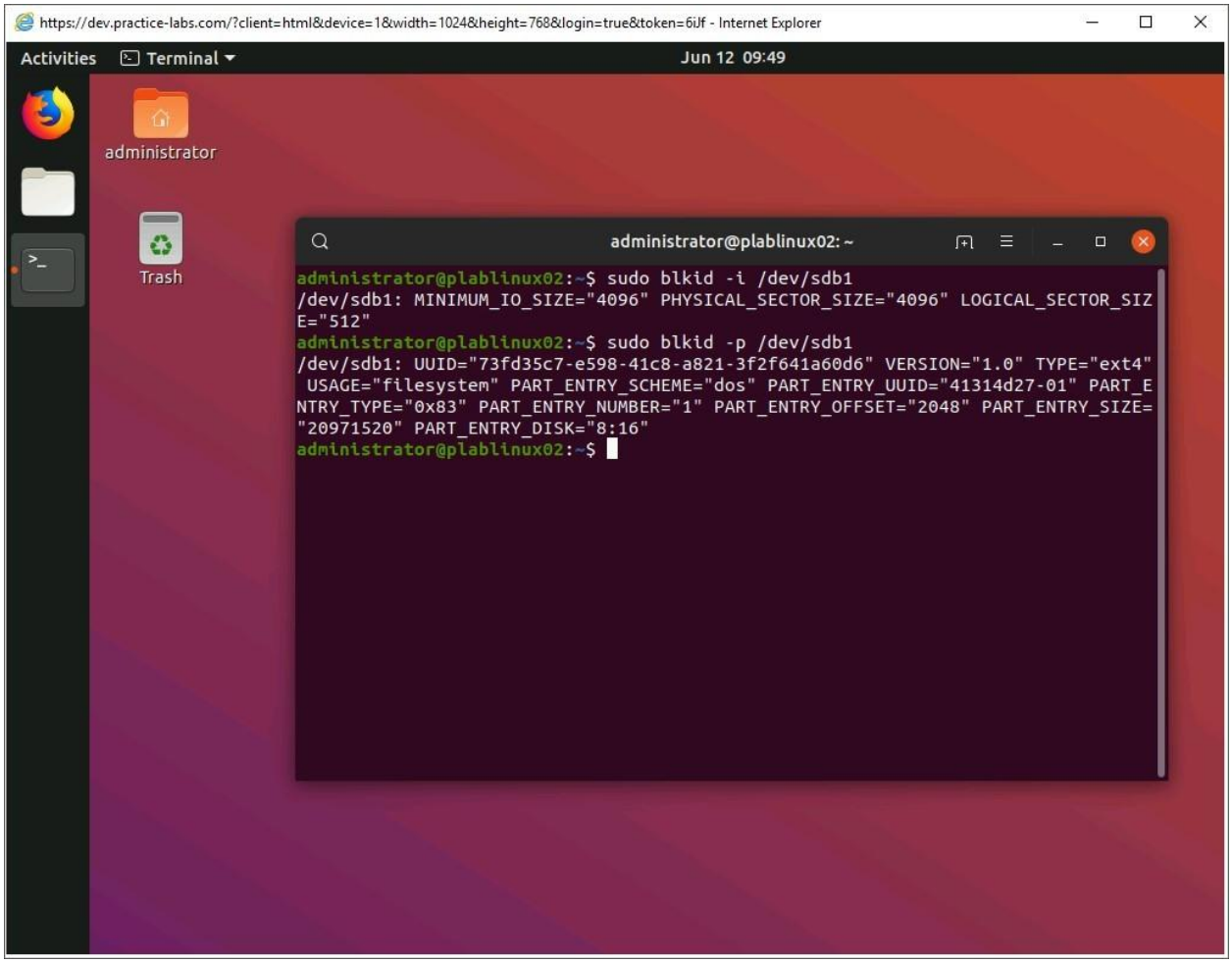

Figure 1.10 Screenshot of PLABLINUX02: Displaying additional information on a specific block device.

Step 4

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can also use the blkid command to display the file system type and also the mount points. Type the following command:

```
sudo blkid -o list
```

Press Enter.

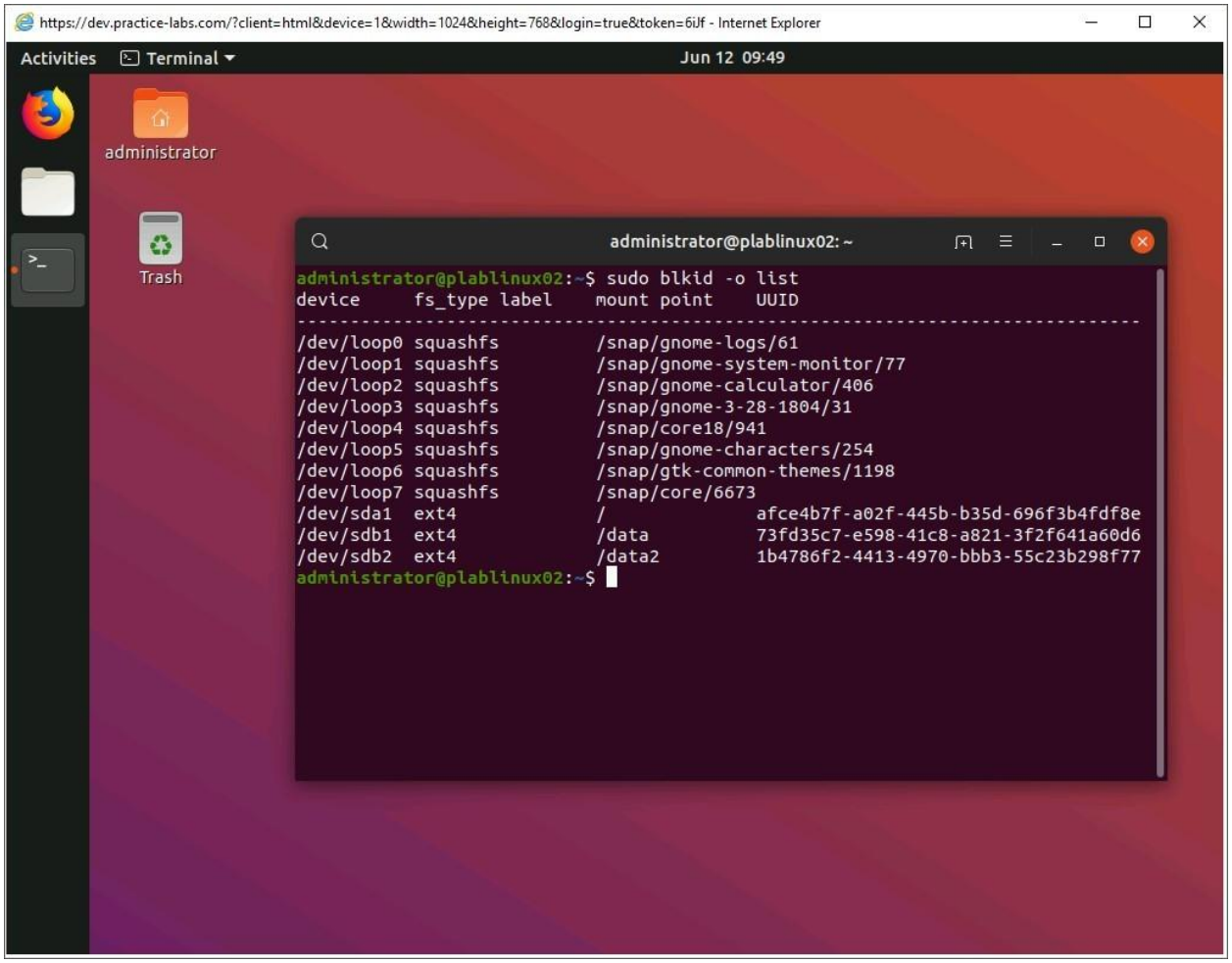

Figure 1.11 Screenshot of PLABLINUX02: Displaying the file system type and also the mount points.

Task 4 - Use Disk Partitioning Tools (fdisk, parted)

Disk partitioning is an essential part of disk management. When a new disk is installed on a system, it cannot be used in a raw format. You will need to create at least one partition, which then needs to be formatted with a specific file system, such as EXT4. In this task, you will learn to use different disk partitioning tools. To do this, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can use the fdisk command to display the partition information along with their file system information. You can also use it to add, modify, or remove partitions. To display the partition information, type the following command:

```
sudo fdisk -l
```

Press Enter.

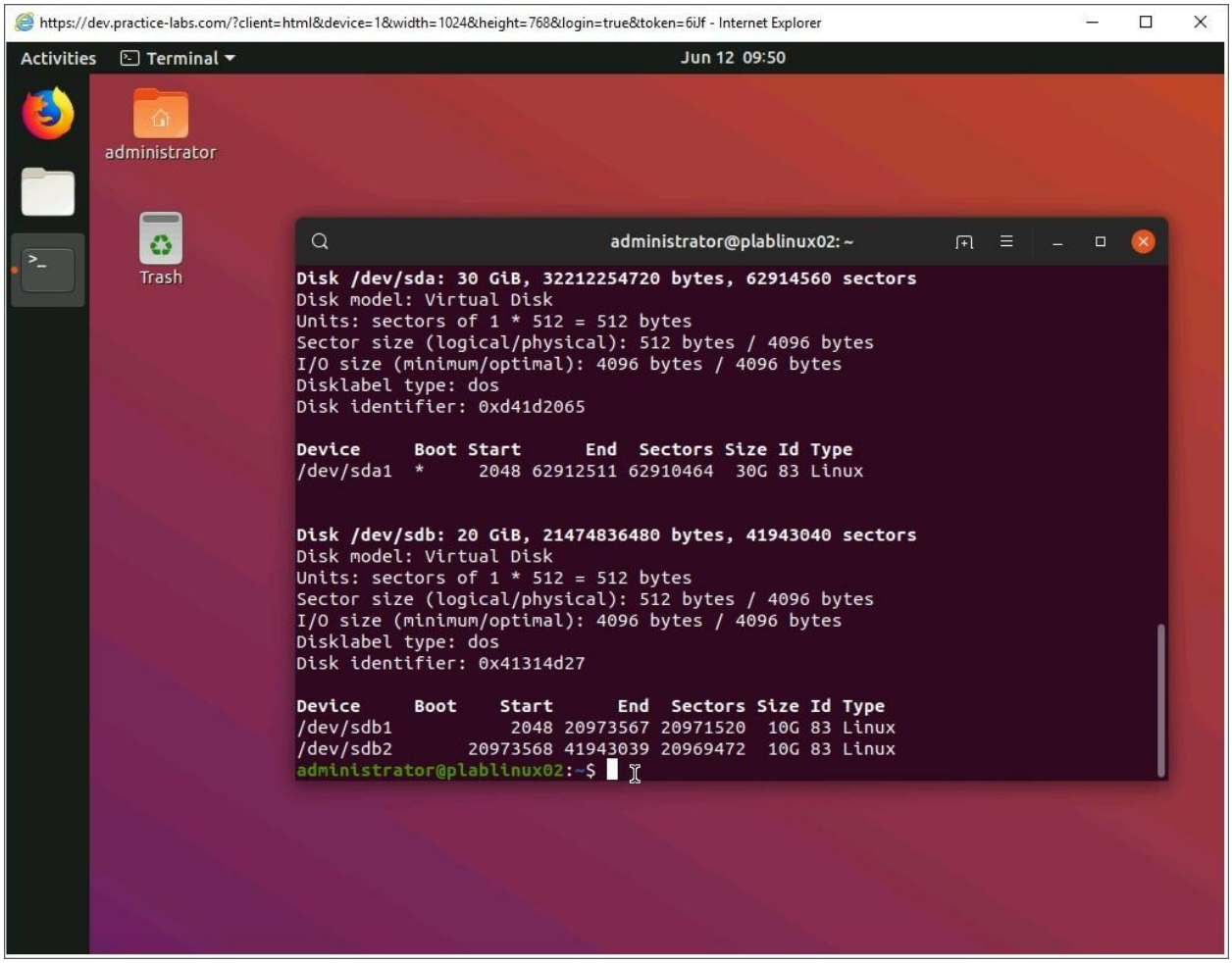

Figure 1.12 Screenshot of PLABLINUX02: Displaying the partition information.

Step 2

Clear the screen by entering the following command:

```
clear
```

Press Enter. To view the partitions of a specific device, type the following command:

```
sudo fdisk -l /dev/sdb
```

Press Enter.

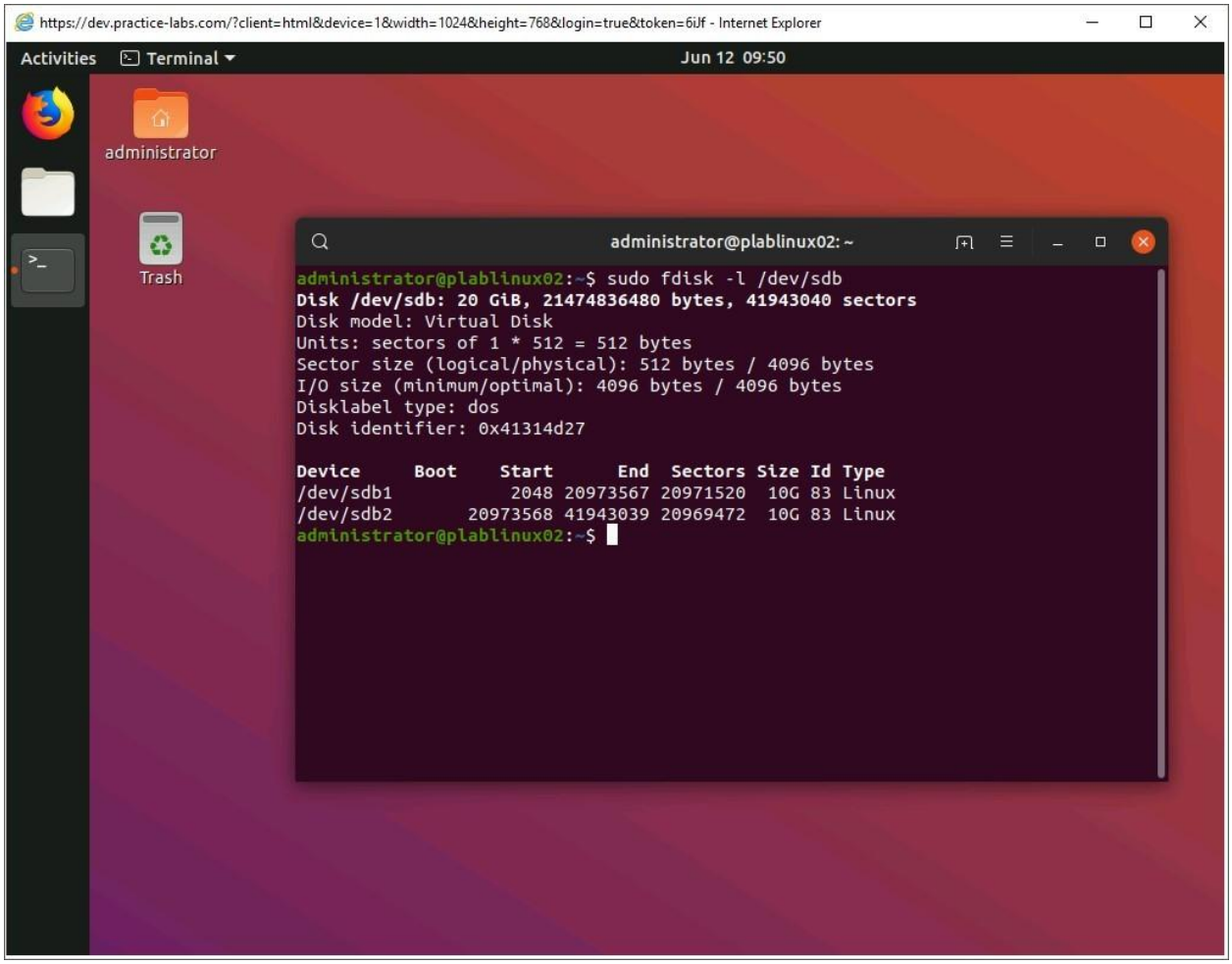

Figure 1.13 Screenshot of PLABLINUX02: Viewing the partitions of a specific device.

Step 3

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can view all commands for fdisk. To do this, type the following command:

```
sudo fdisk /dev/sdb
```

Press Enter.

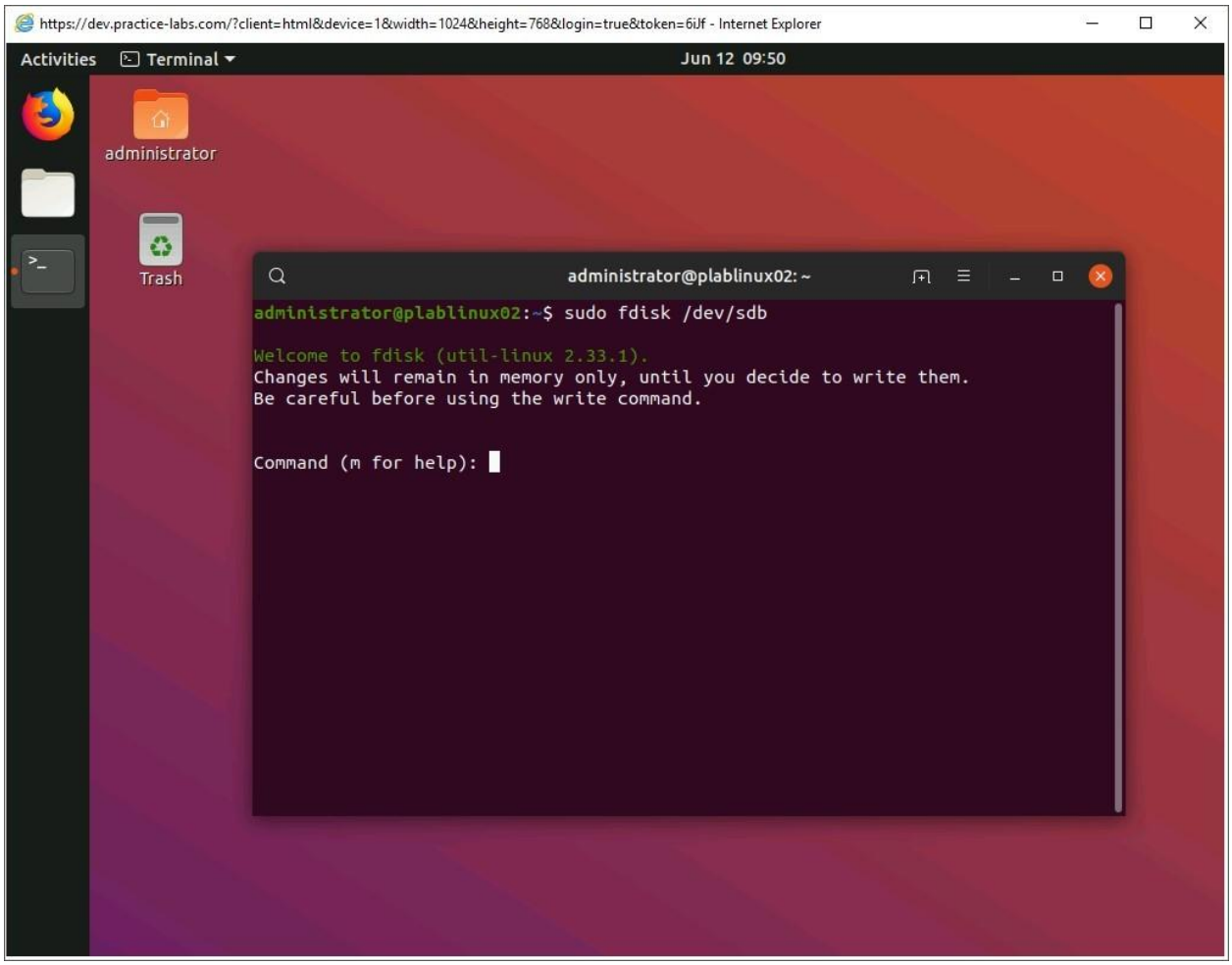

Figure 1.14 Screenshot of PLABLINUX02: Viewing all commands for fdisk.

Step 4

To print the menu, type the following:

```
m
```

Press Enter.

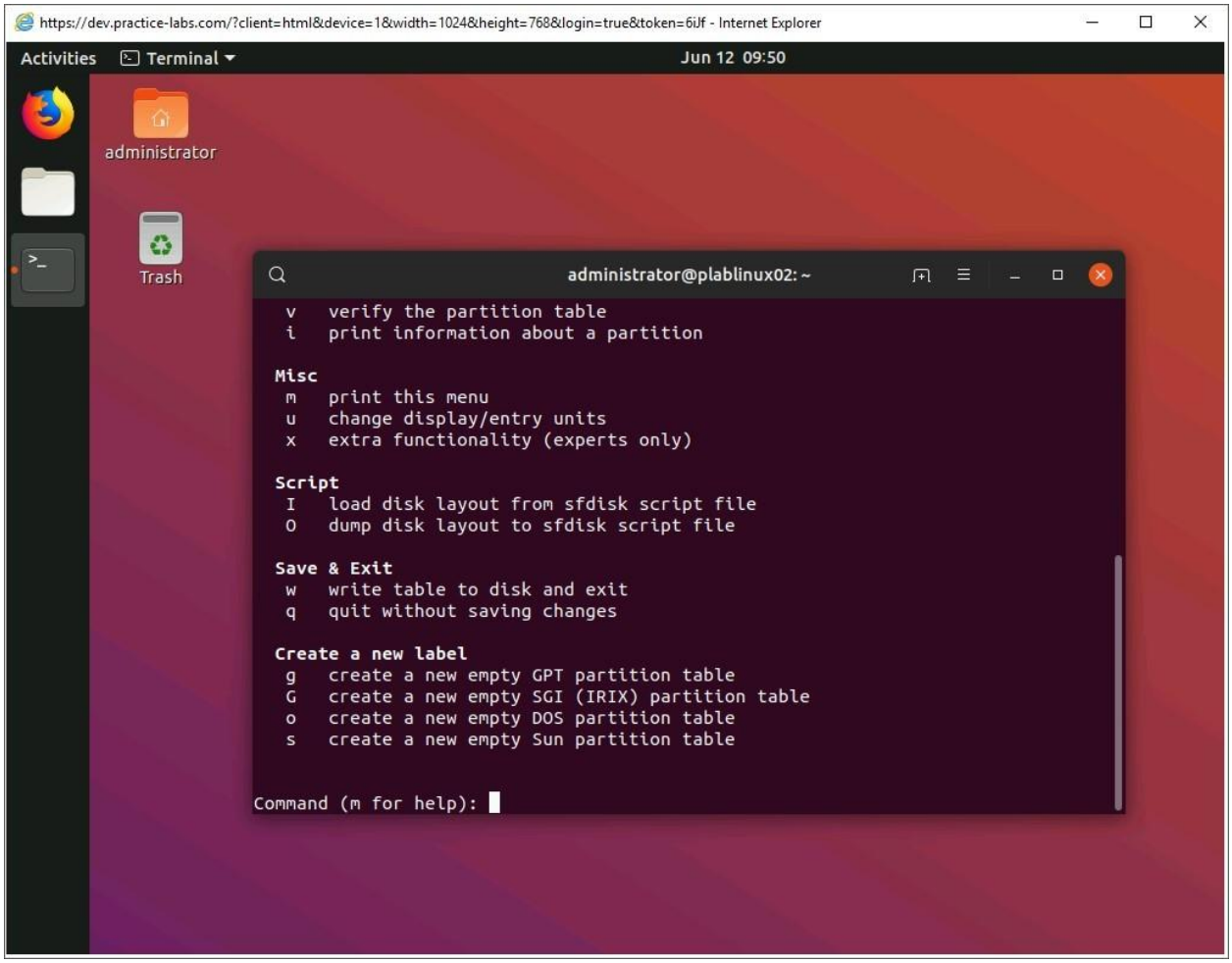

Figure 1.15 Screenshot of PLABLINUX02: Printing the fdisk menu.

Step 5

To print the partitions for /dev/sdb, type the following:

`p`

Press Enter.

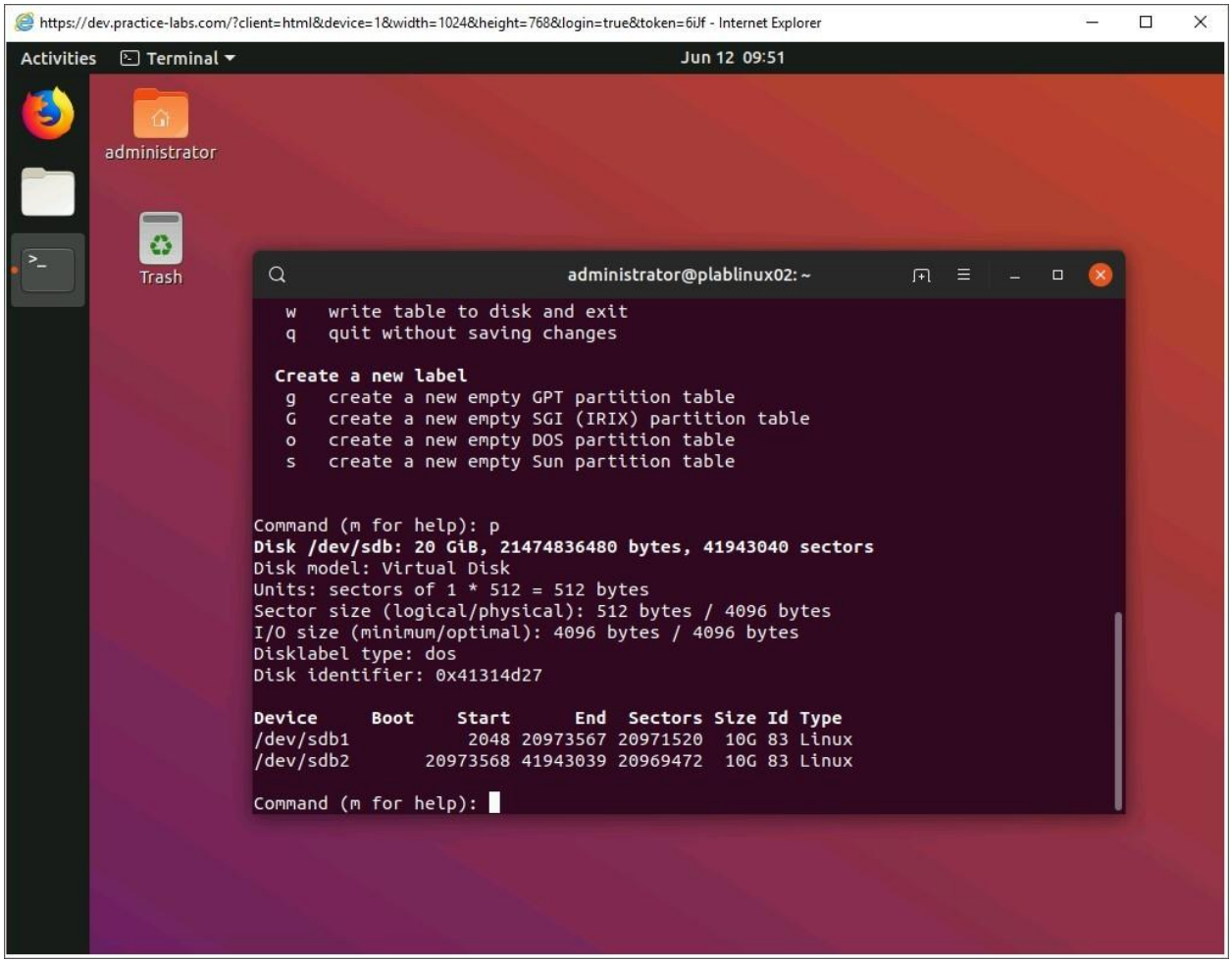

Figure 1.16 Screenshot of PLABLINUX02: Printing the partitions for /dev/sdb.

Step 6

To delete a partition of /dev/sdb, type the following:

```
d
```

Press Enter. You are now prompted for the partition number.

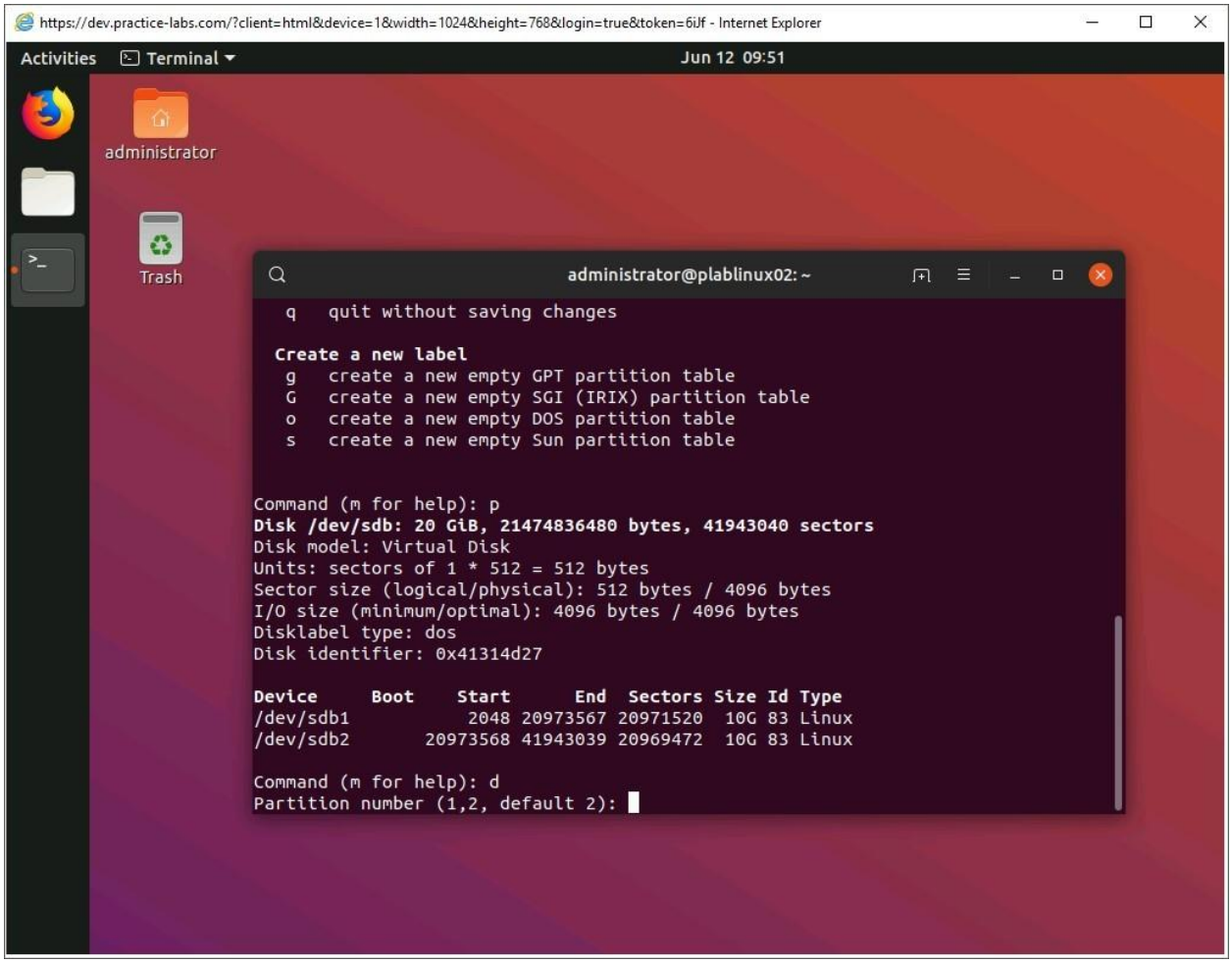

Figure 1.17 Screenshot of PLABLINUX02: Deleting a partition of /dev/sdb.

Step 7

Type the following partition number:

2

Press Enter. The partition 2 is now deleted.

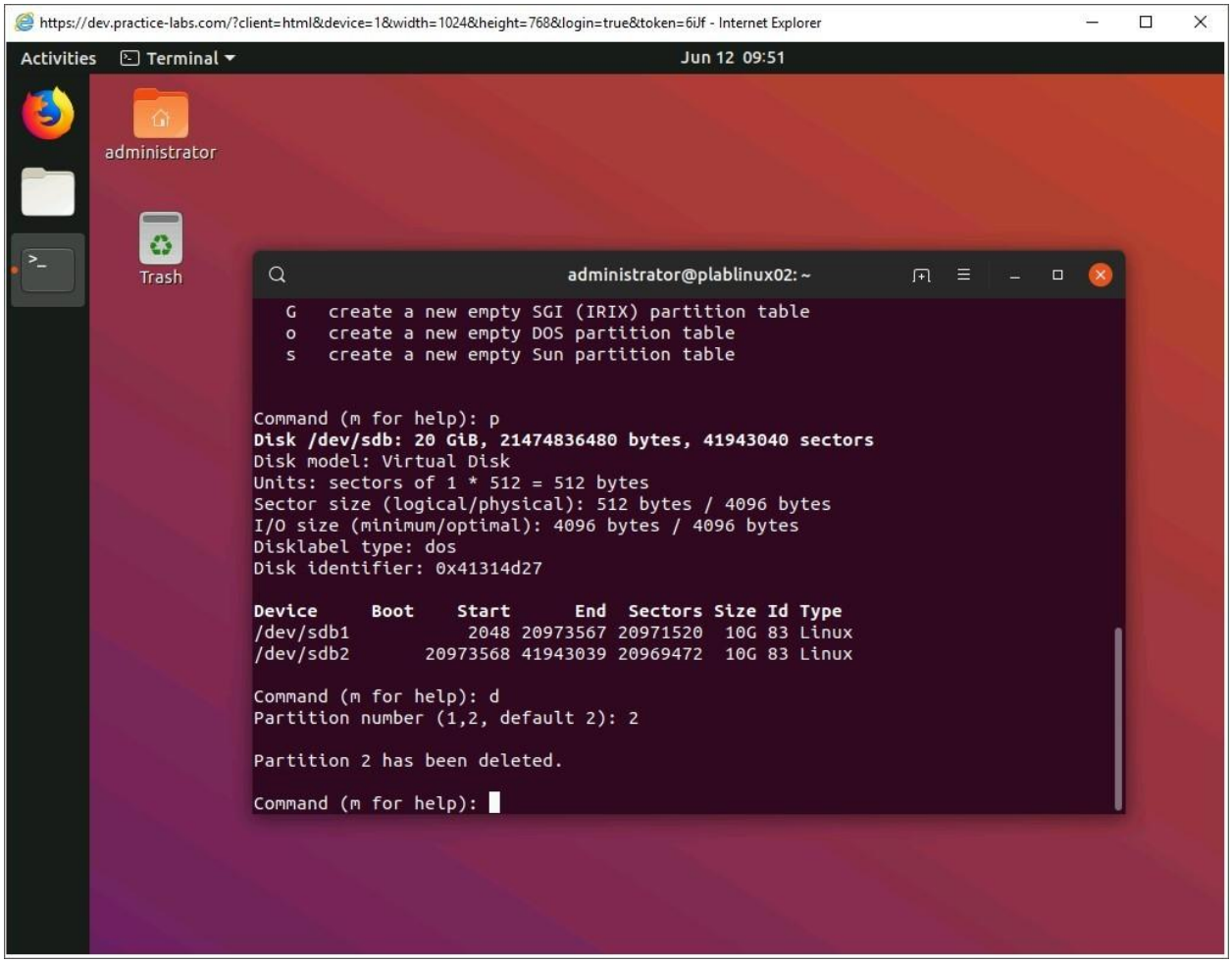

Figure 1.18 Screenshot of PLABLINUX02: Entering the partition number for deletion.

Step 8

After you make changes to the partition table, you need to write the partition table to the disk. To do this, type the following:

```
w
```

Press Enter. Notice that the partition table has been altered but not written. This is because the partition is currently mounted. If you need to write the partition table to the disk immediately, you will need to unmount the partition with the umount command.

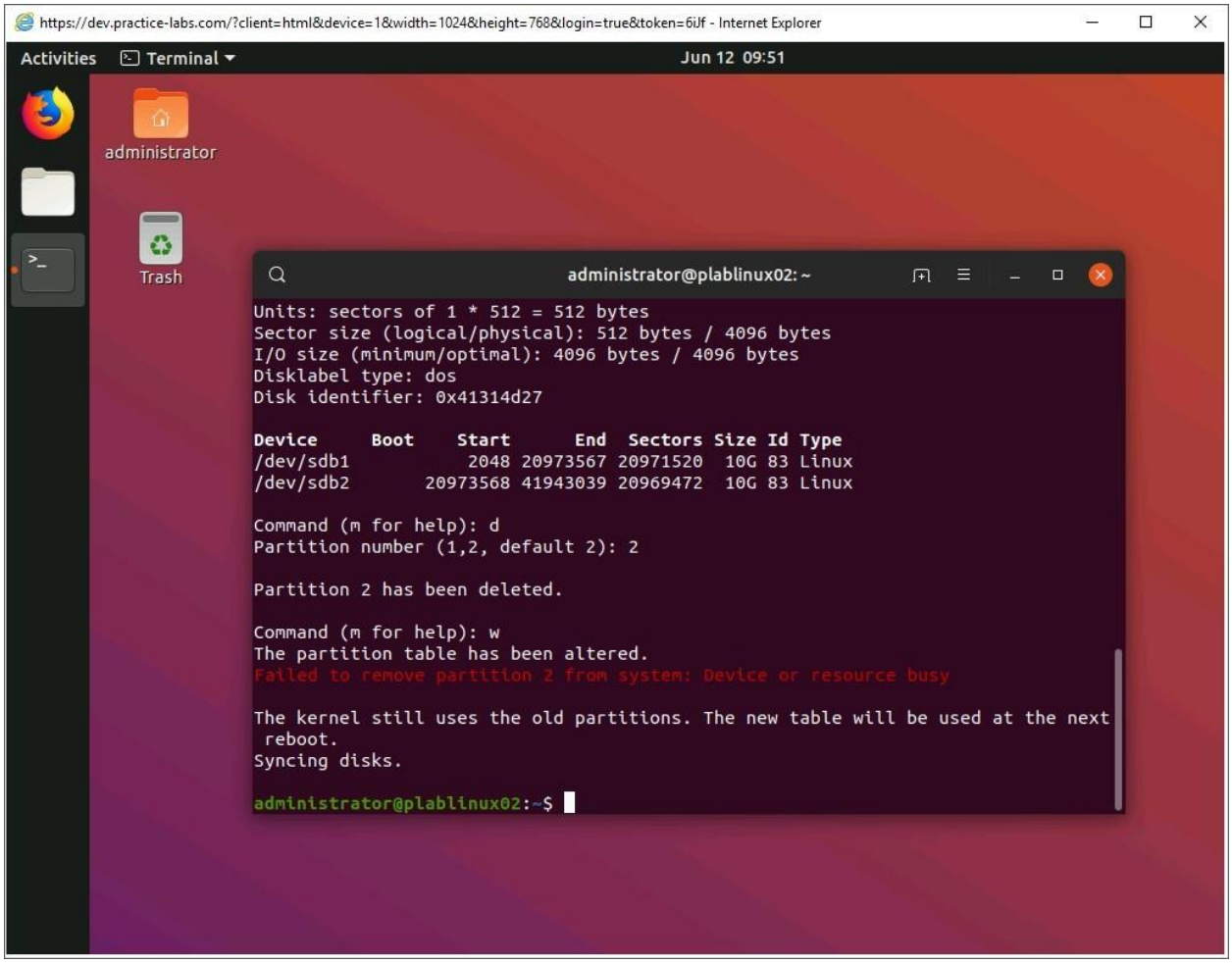

Figure 1.19 Screenshot of PLABLINUX02: Writing the modified partition table to the disk.

Step 9

Note: Before proceeding with the next steps, it is better to reset the device in the Practice Labs environment. After the device is reset, re-login with the administrator account and open the terminal window.

Parted is another utility that you can use to manipulate the partitions. To start the parted command, type the following command:

```
sudo parted
```

Press Enter. Notice by default that parted is used /dev/sda. The (parted) prompt is displayed.

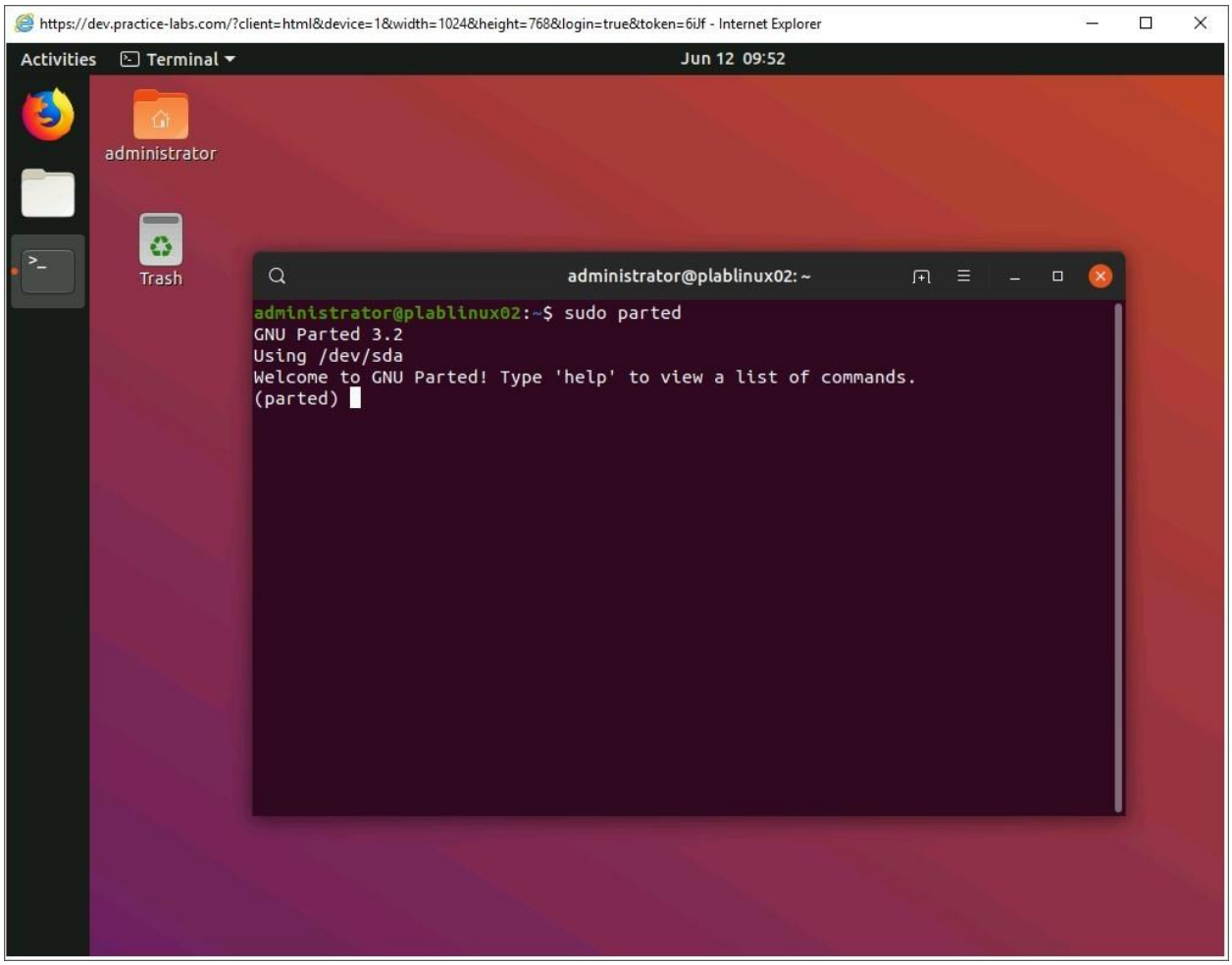

Figure 1.20 Screenshot of PLABLINUX02: Starting the parted utility.

Step 10

To select another device, type the following command:

```
select /dev/sdb
```

Press Enter. The /dev/sdb device is now being used by parted.

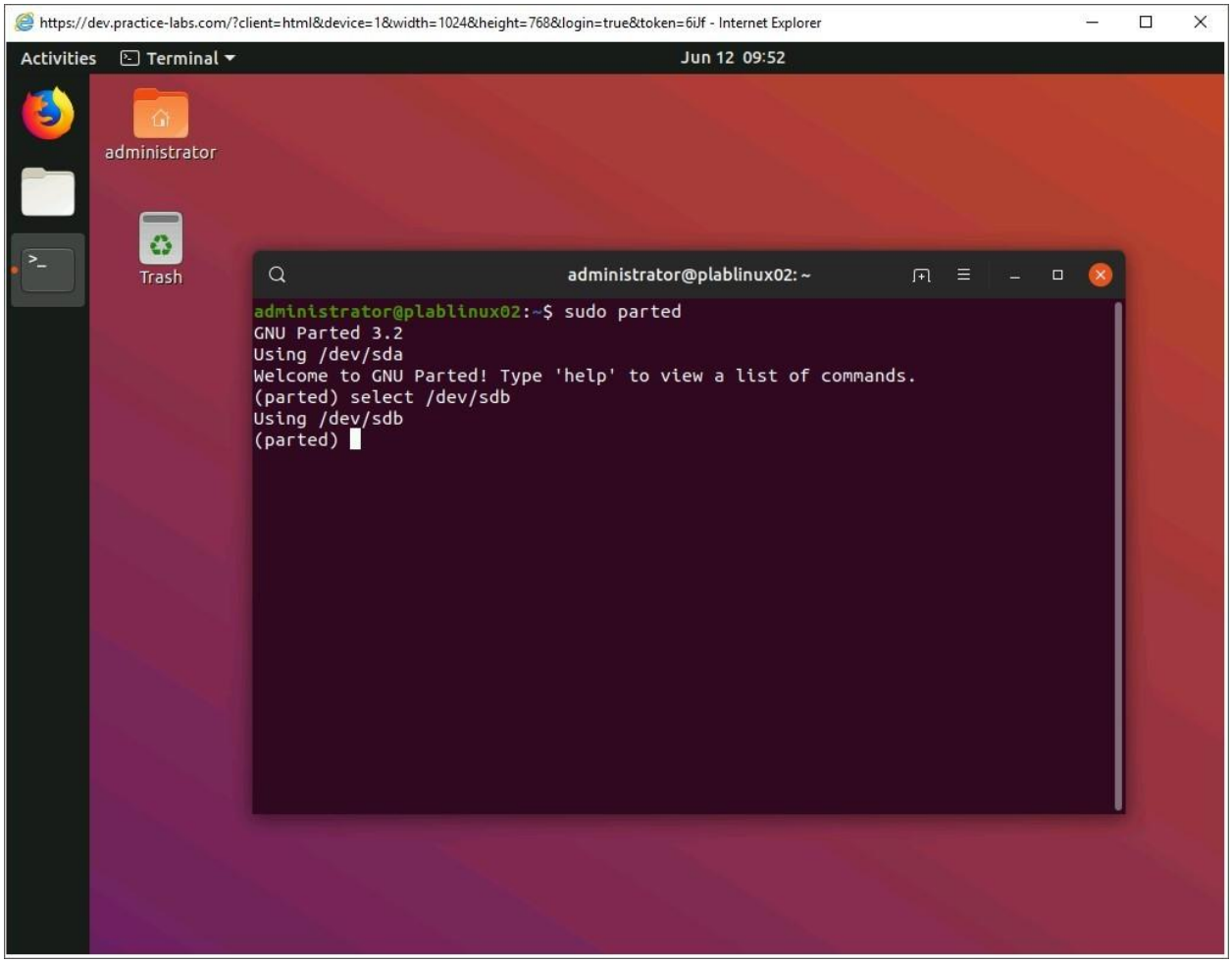

Figure 1.21 Screenshot of PLABLINUX02: Selecting a different device in the parted utility.

Step 11

To print the partitions available on /dev/sdb, type the following command:

```
print
```

Press Enter. The partitions on the /dev/sdb device are now listed.

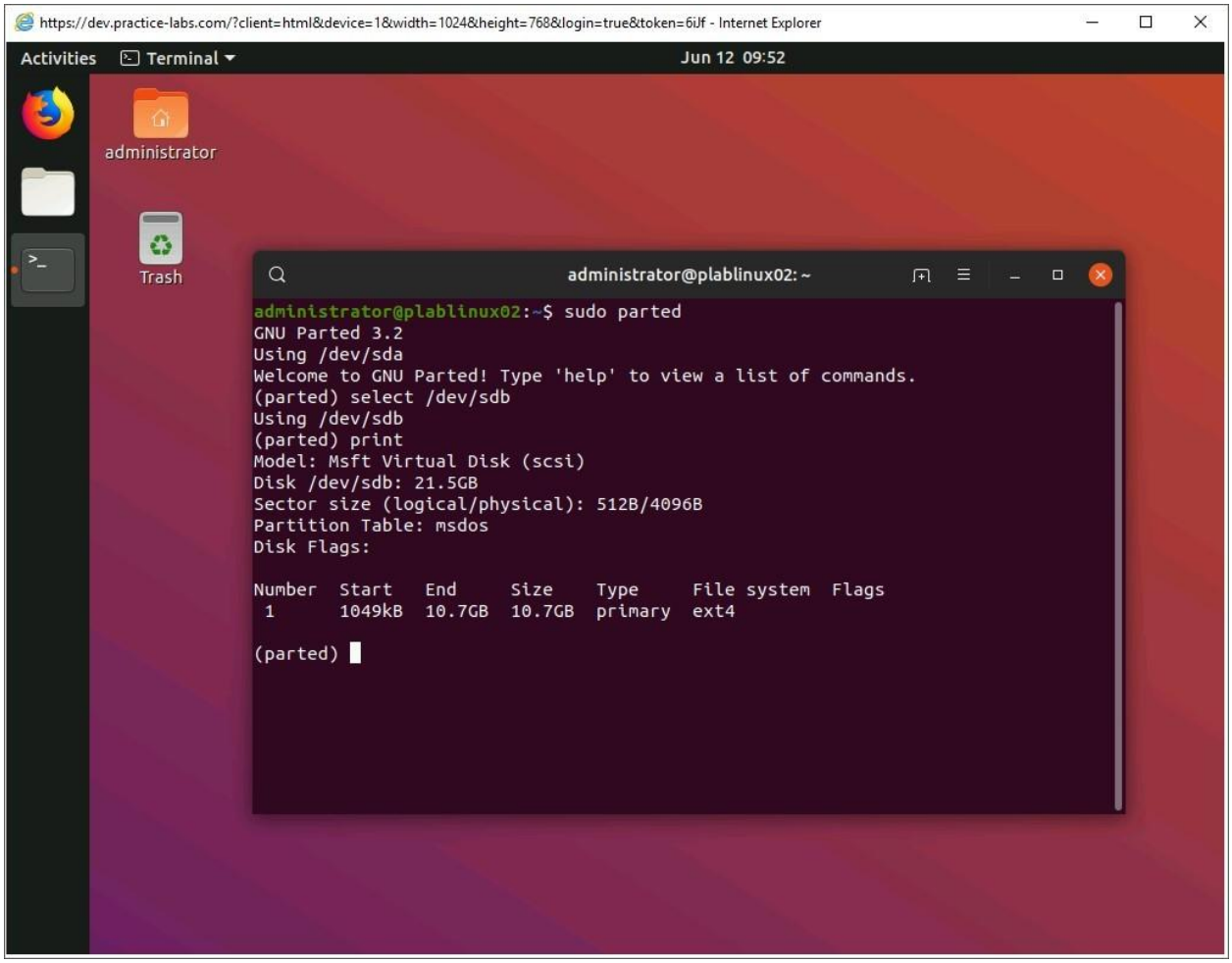

Figure 1.22 Screenshot of PLABLINUX02: Printing the partition information.

Step 12

To delete a partition using parted, type the following command:

```
rm
```

Press Enter. You will be prompted with the partition number.

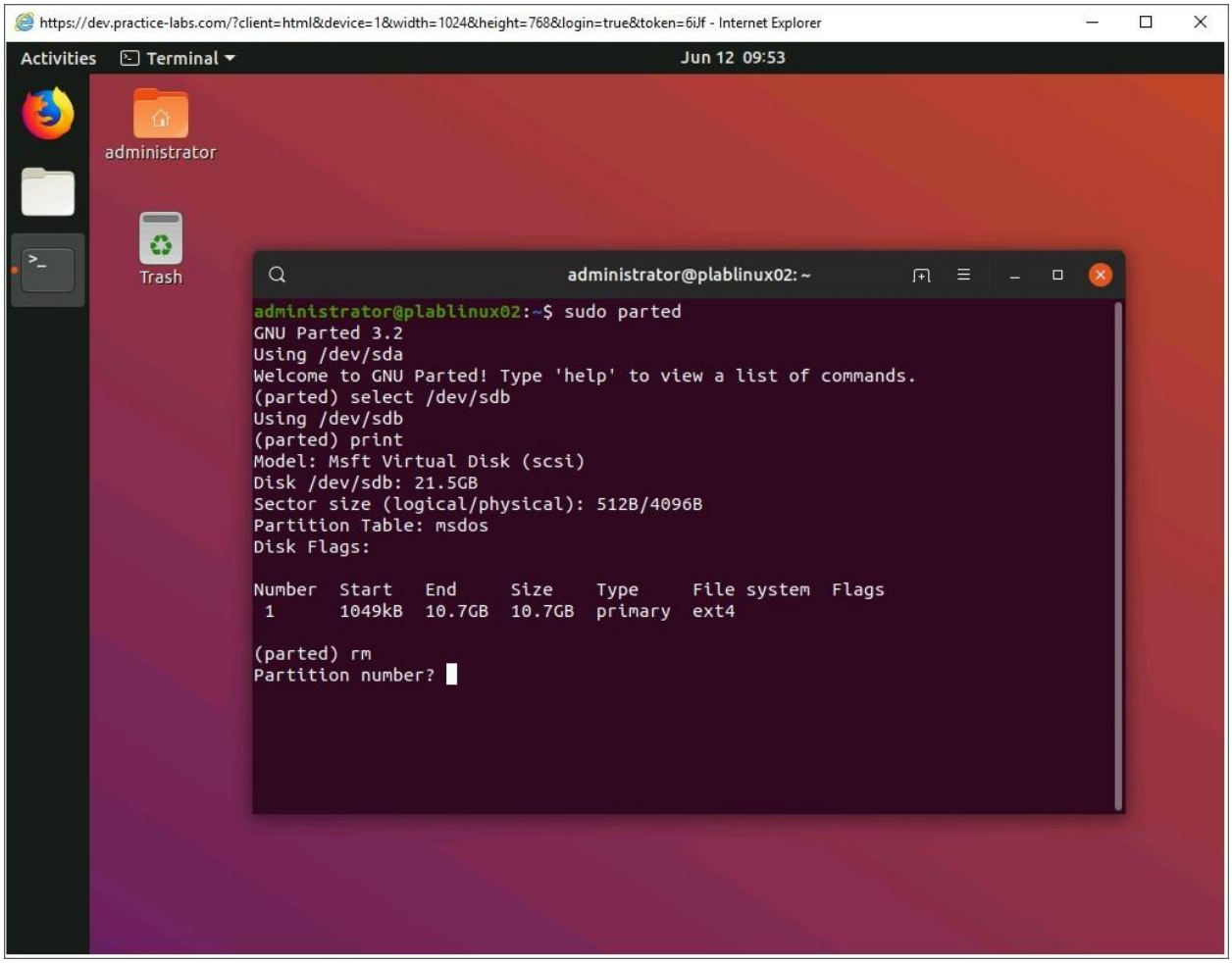

Figure 1.23 Screenshot of PLABLINUX02: Deleting a partition using parted.

Step 13

To select a partition for deletion, type the following number:

```
1
```

Press Enter. You will be prompted to confirm the deletion.

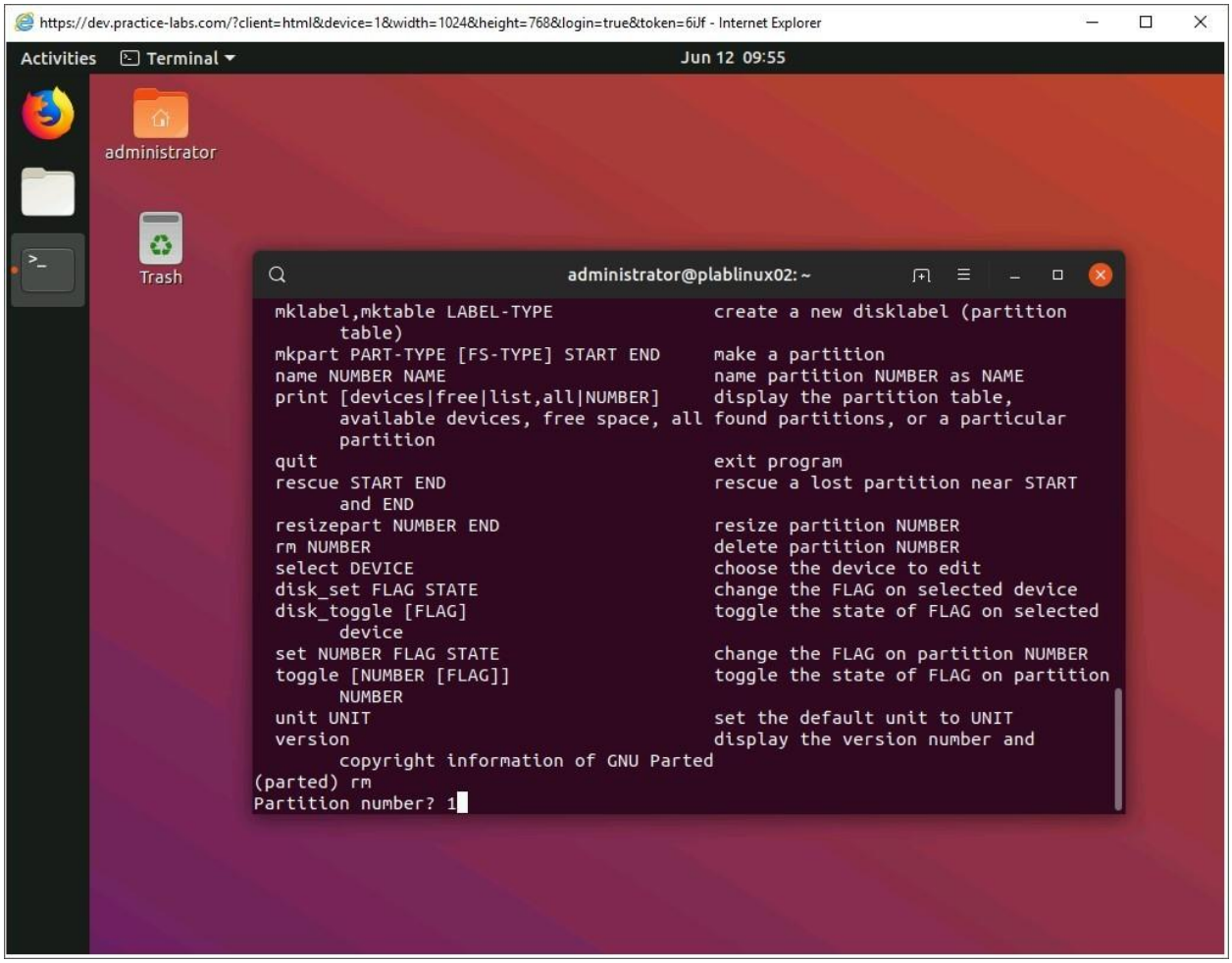

Figure 1.24 Screenshot of PLABLINUX02: Entering the partition number for deletion.

Step 14

To confirm, type the following:

```
Yes
```

Press Enter.

To ignore the error message, type the following:

```
Ignore
```

Press Enter. You are now back on the prompt.

Note: To avoid this error message, you should first unmount the partition and then delete it using parted. At present, even though the partition has been deleted, it is still not written to the disk.

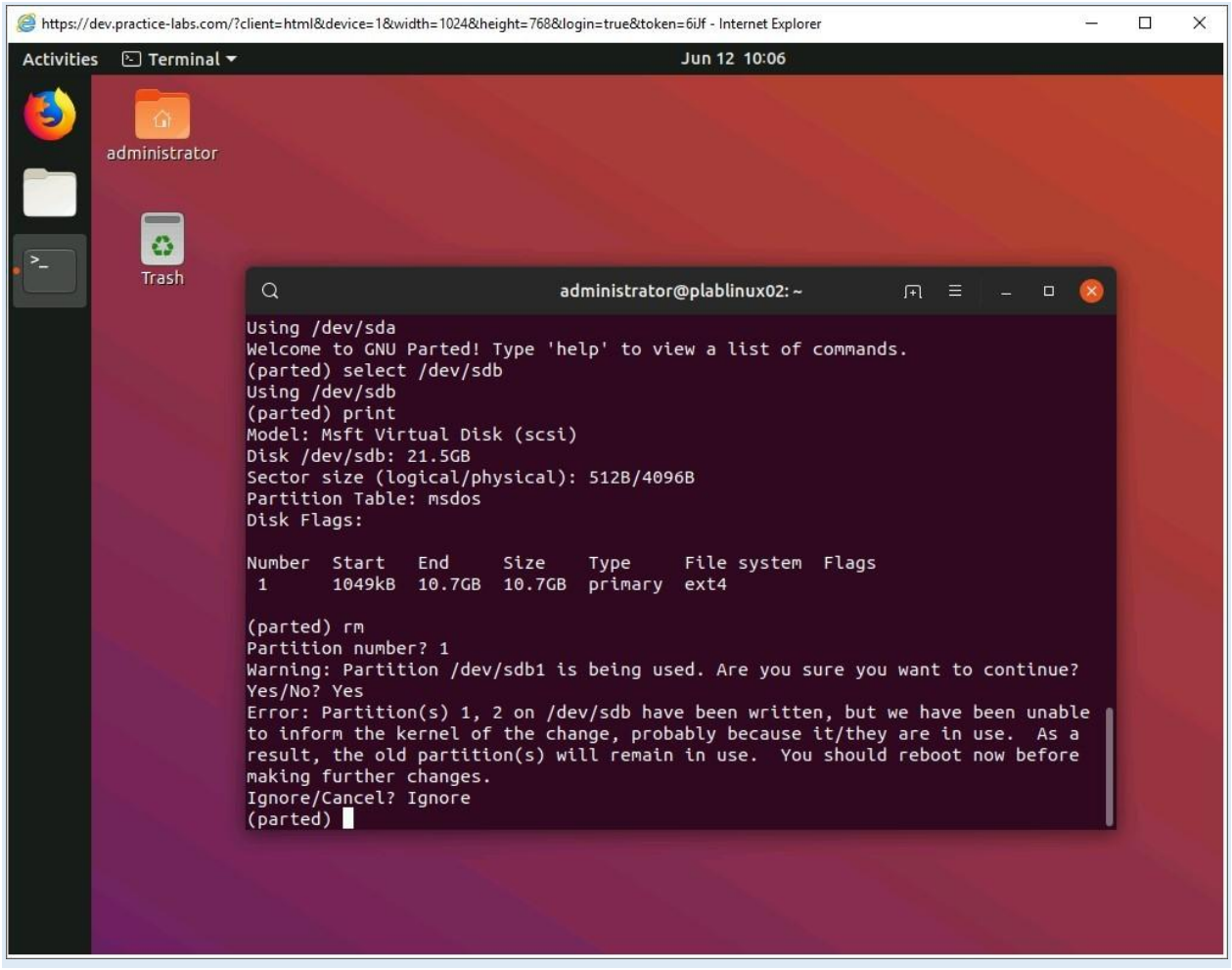

Figure 1.25 Screenshot of PLABLINUX02: Ignoring the error message.

Step 15

To confirm the deletion of the partition, type the following:

```
print
```

Press Enter. Notice that there is only one partition.

Type the following command to exit from parted:

```
quit
```

Press Enter.

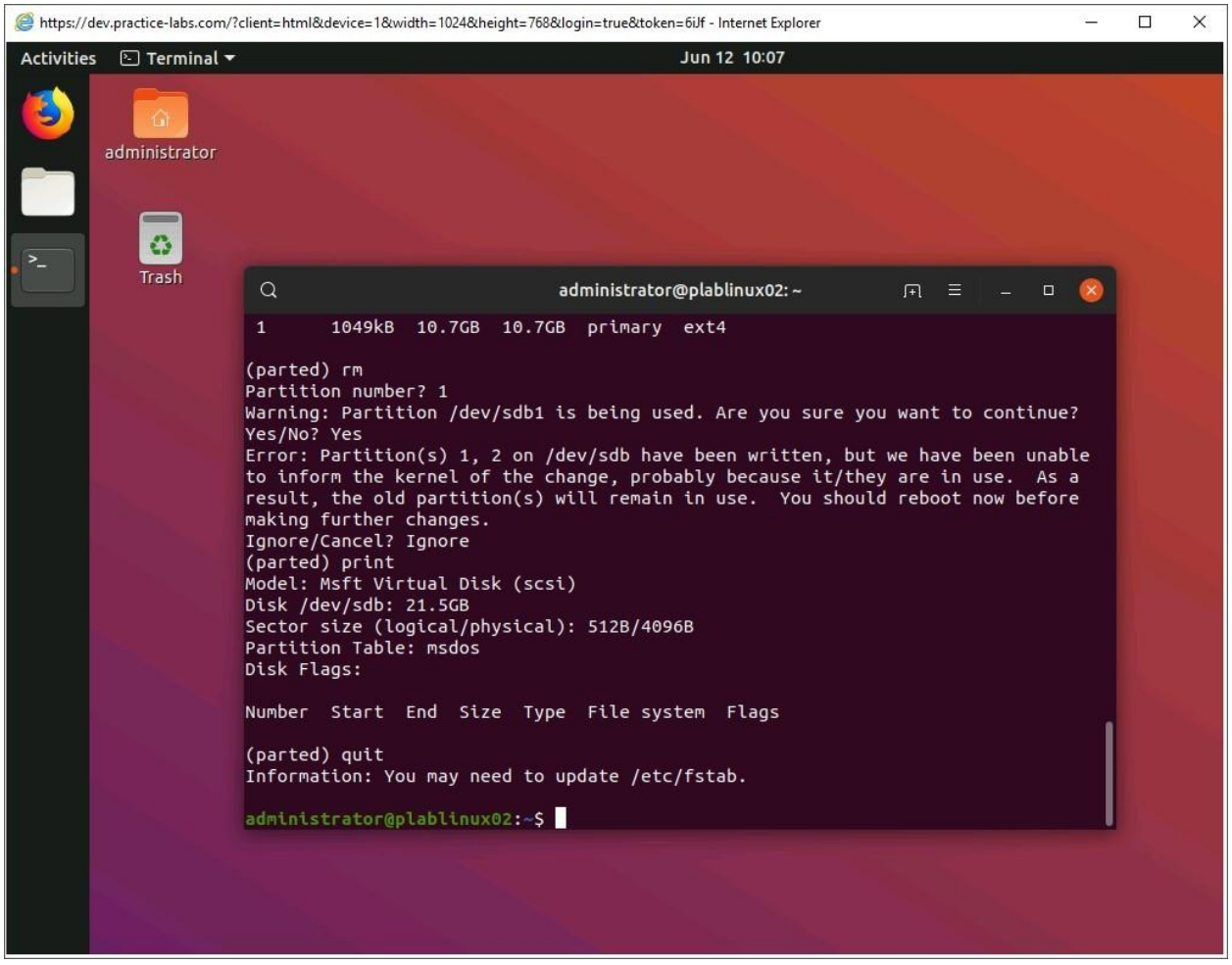

Figure 1.26 Screenshot of PLABLINUX02: Confirming the deletion of the partition.

Task 5 - Monitoring Free Disk Space and Inodes using various commands and utilities

Monitoring disk utilization is crucial in system management. The administrator must know a handful of tools to monitor the disk space.

In this task, you will learn to monitor free disk space and inodes. To do this, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Press Enter. To find the free disk space, type the following command:

```
df -a
```

Press Enter.

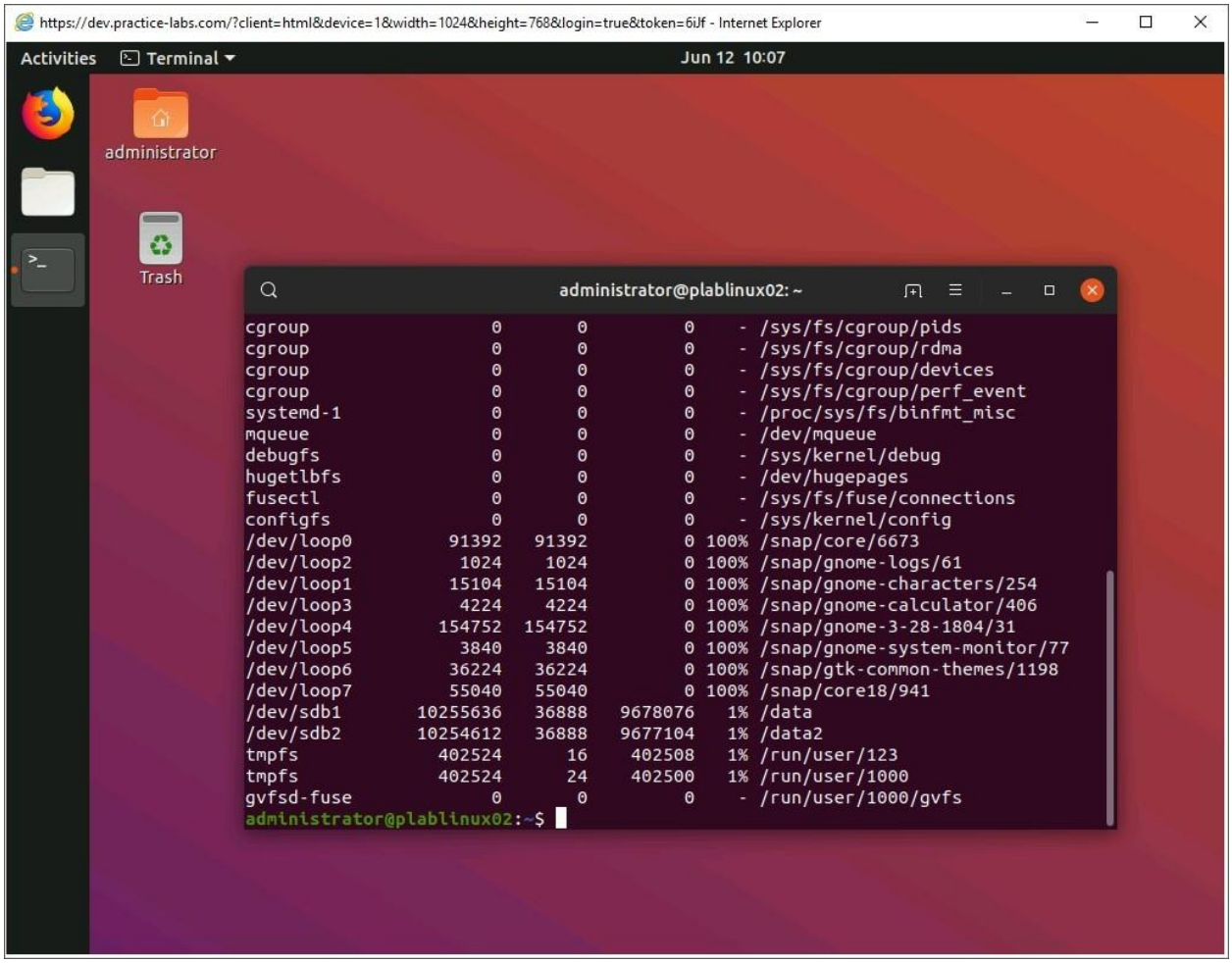

Figure 1.27 Screenshot of PLABLINUX02: Finding the free disk space.

Step 2

Clear the screen by entering the following command:

```
clear
```

Press Enter. To find the free disk space in Kilobytes, Megabytes, and Gigabytes, type the following command:

```
df -h
```

Press Enter.

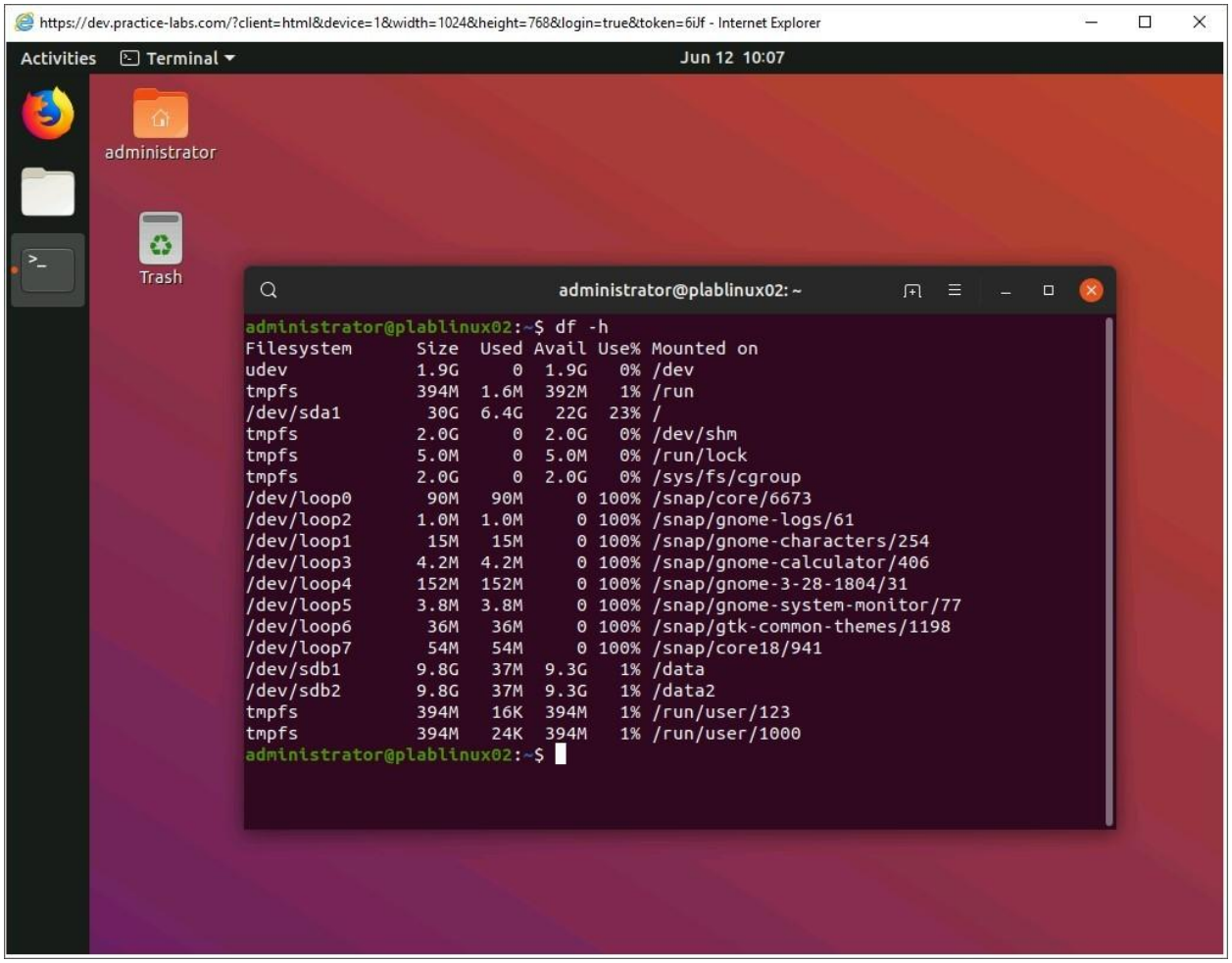

Figure 1.28 Screenshot of PLABLINUX02: Finding the free disk space in Kilobytes, Megabytes, and Gigabytes.

Step 3

Clear the screen by entering the following command:

```
clear
```

Press Enter. To find the free disk space disk usage along with the filesystem usage, type the following command:

```
df -T
```

Press Enter.

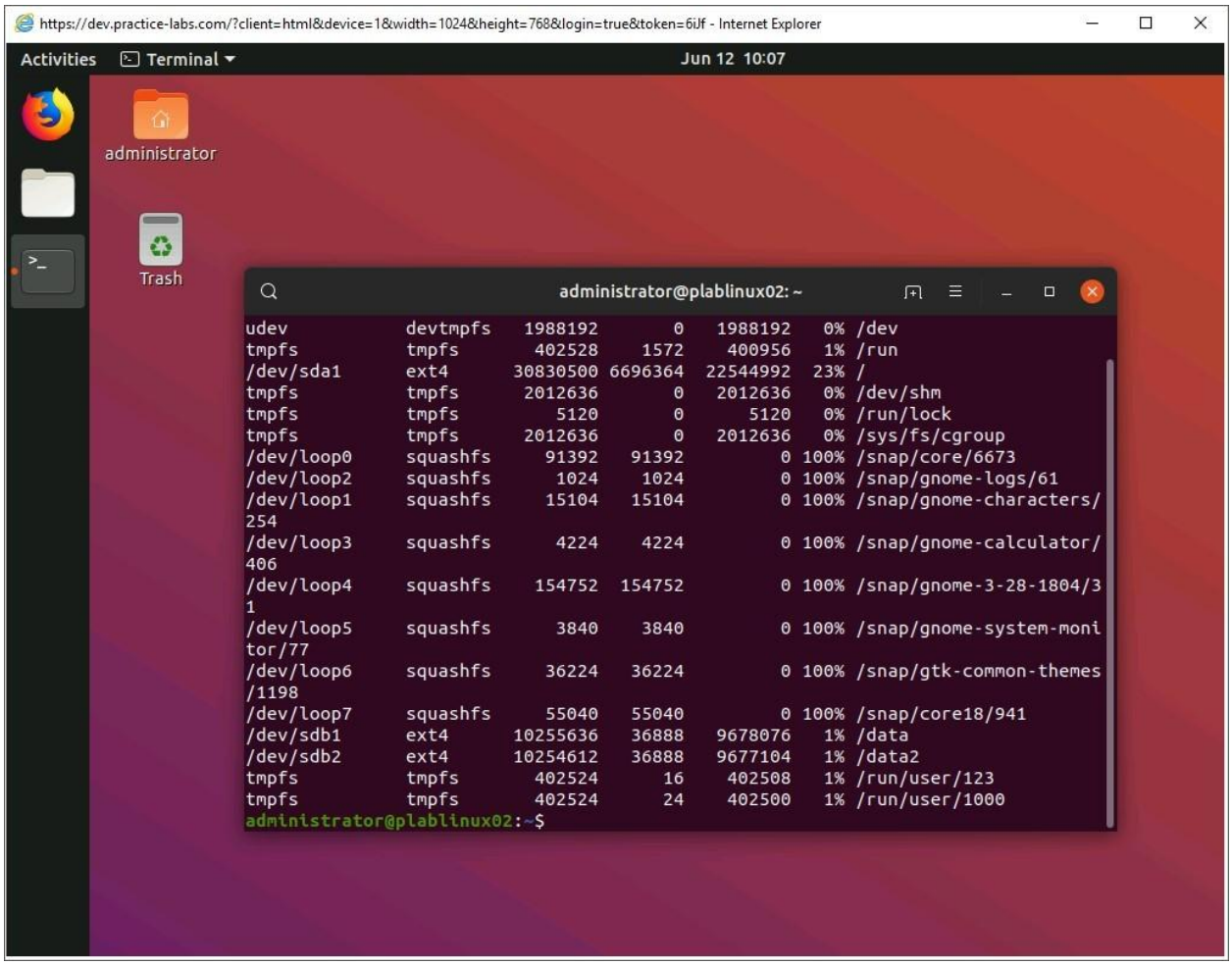

Figure 1.29 Screenshot of PLABLINUX02: Finding the free disk space disk usage along with the filesystem usage.

Step 4

Clear the screen by entering the following command:

```
clear
```

Press Enter. To show the free and used nodes, type the following command:

```
df -i
```

Press Enter.

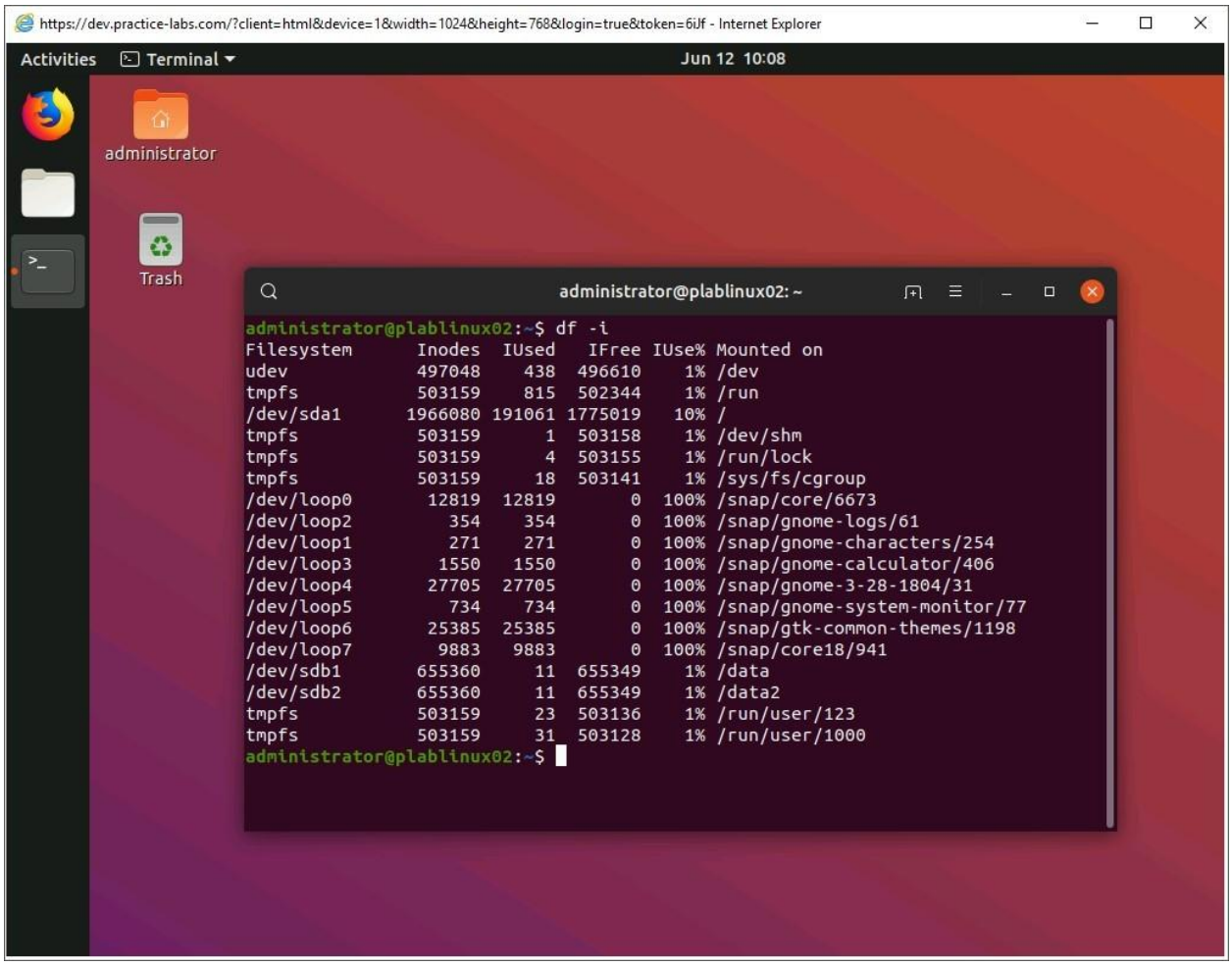

Figure 1.30 Screenshot of PLABLINUX02: Showing the free and used nodes.

Step 5

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can use the stat command to display the inode data of a file or directory. Type the following command:

```
stat /etc
```

Press Enter.

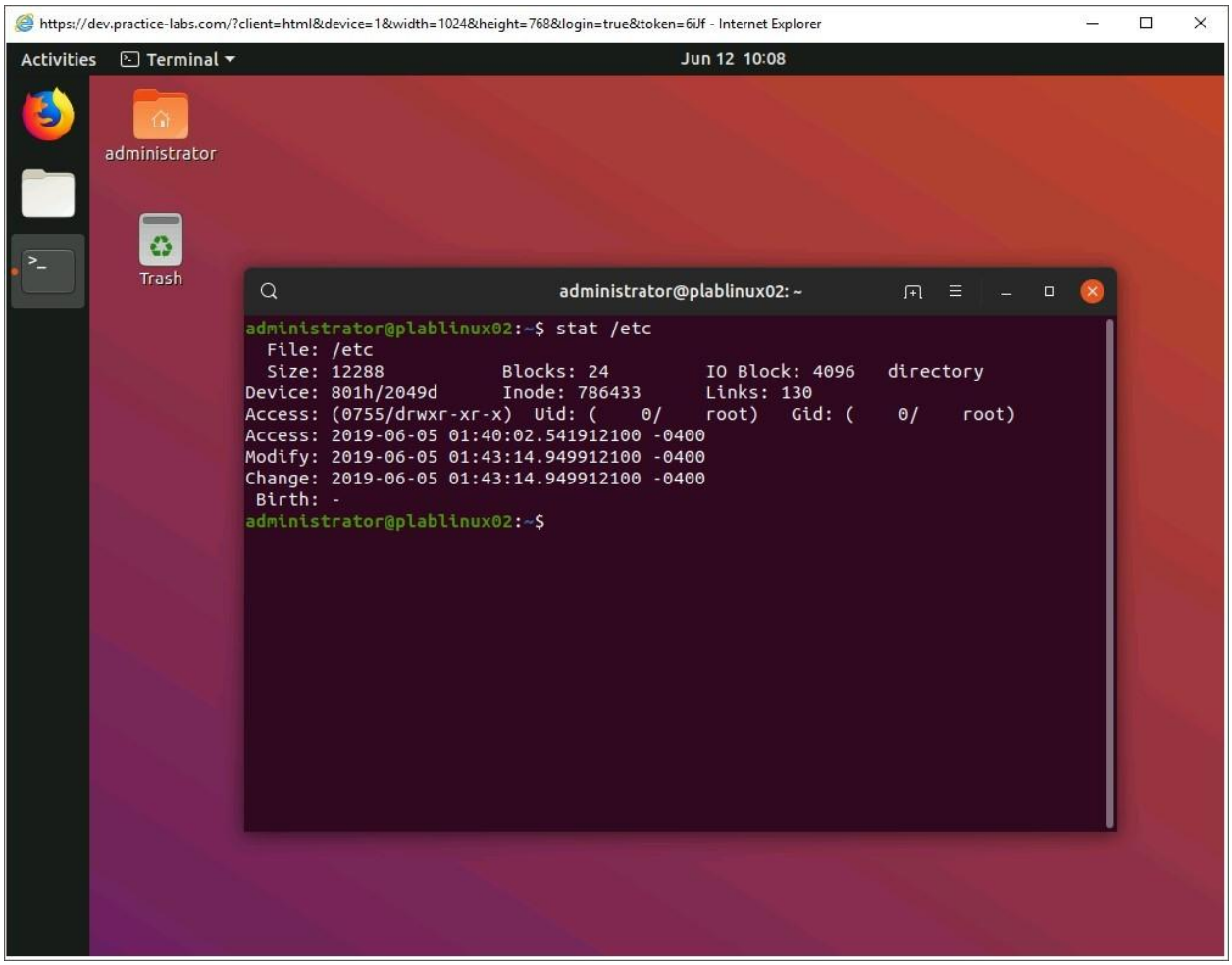

Figure 1.31 Screenshot of PLABLINUX02: Using the stat command to display the inode data of a file or directory.

Step 6

You can also display the inode of a single file or directory. To display the inode of a file, type the following command:

```
stat --format=%i /etc/hosts
```

Press Enter.

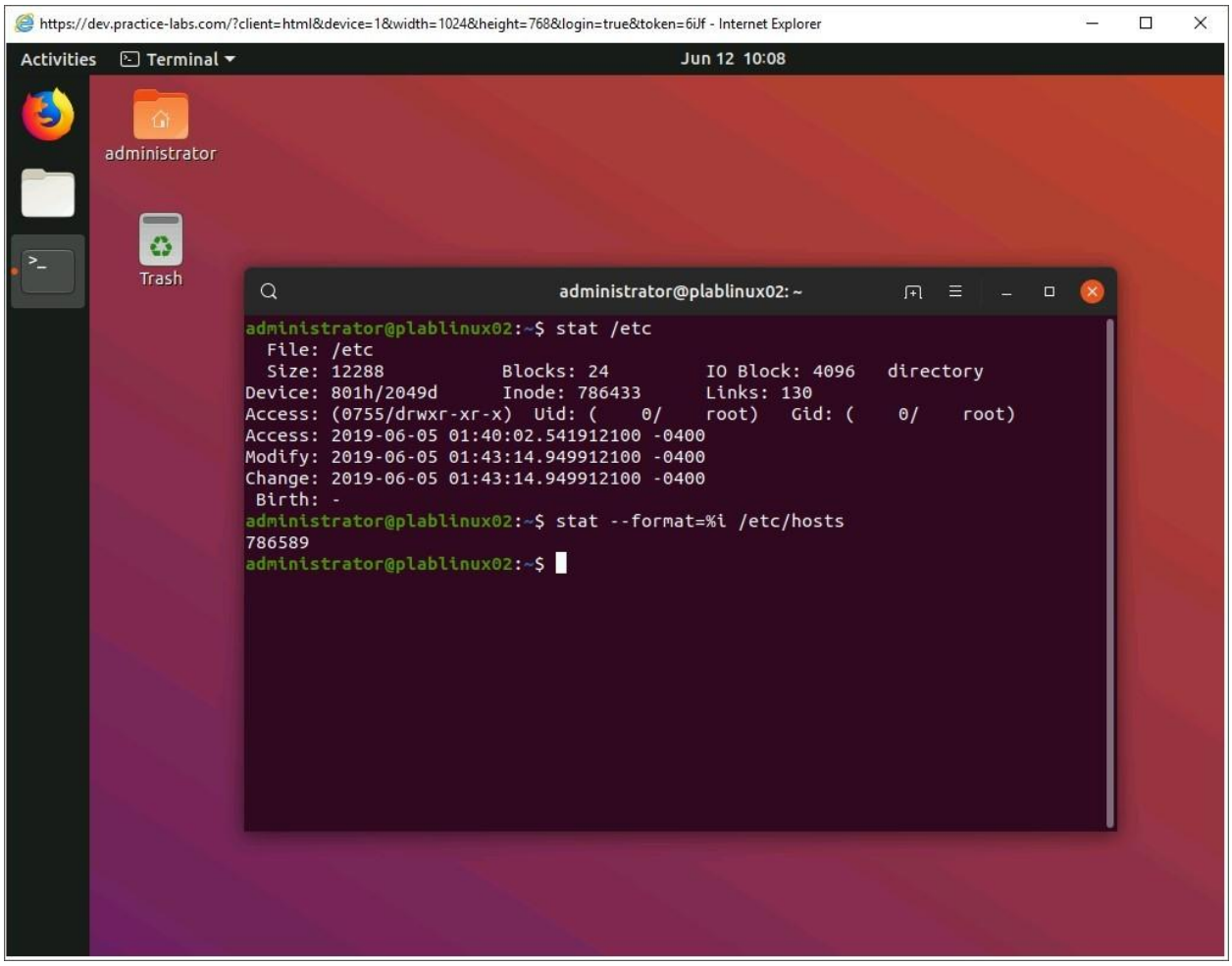

Figure 1.32 Screenshot of PLABLINUX02: Displaying the inode of a single file.

Step 7

You can also display the inode of single or multiple files. To display the inode of a file, type the following command:

```
ls -il /etc/hosts
```

Press Enter.

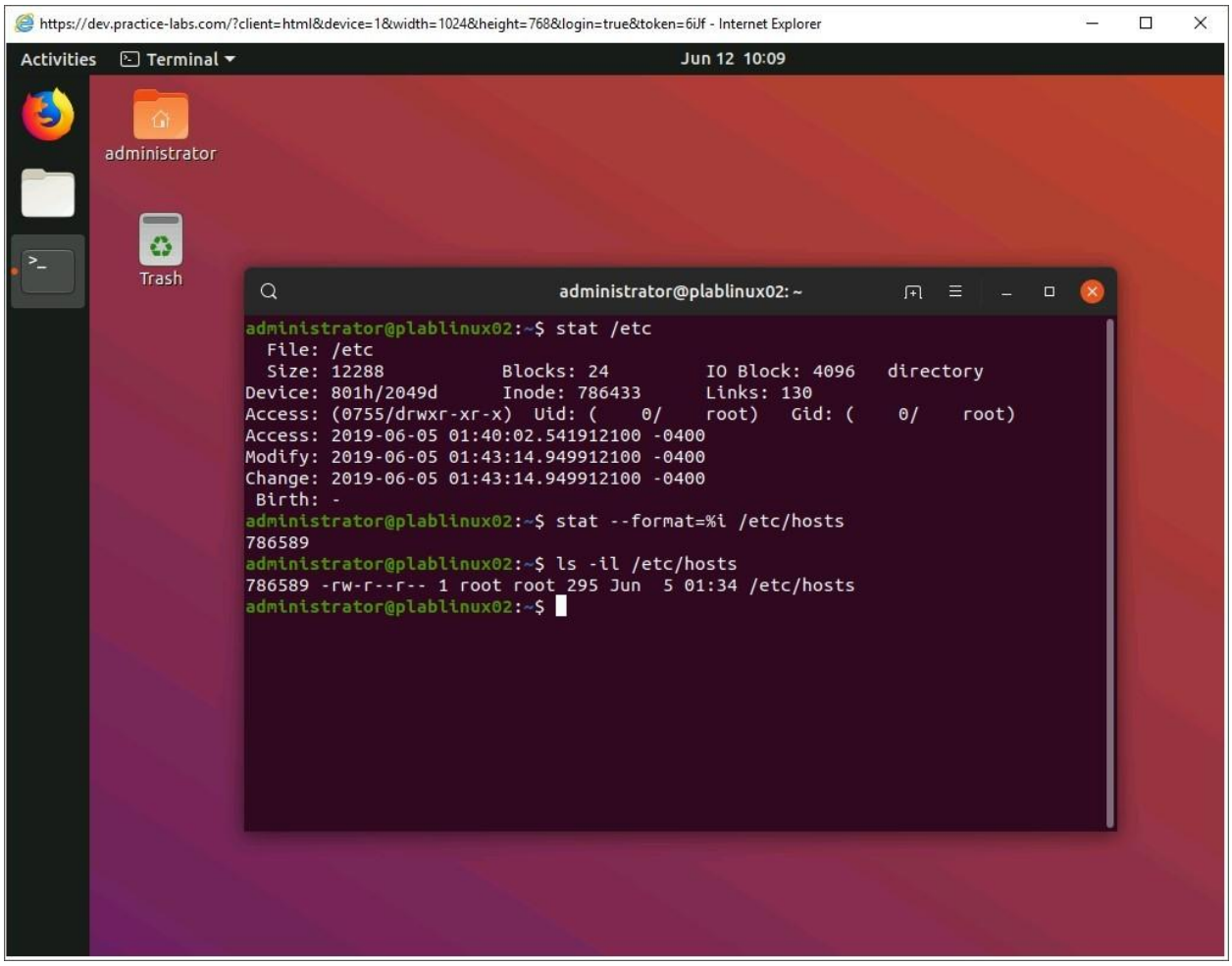

Figure 1.33 Screenshot of PLABLINUX02: Displaying the inode of a file using the ls command.

Step 8

Clear the screen by entering the following command:

```
clear
```

Press Enter. To display the inode of multiple files in the /etc directory, type the following command:

```
ls -il /etc
```

Press Enter. All files that are stored in the /etc directory are now listed with their inode numbers.

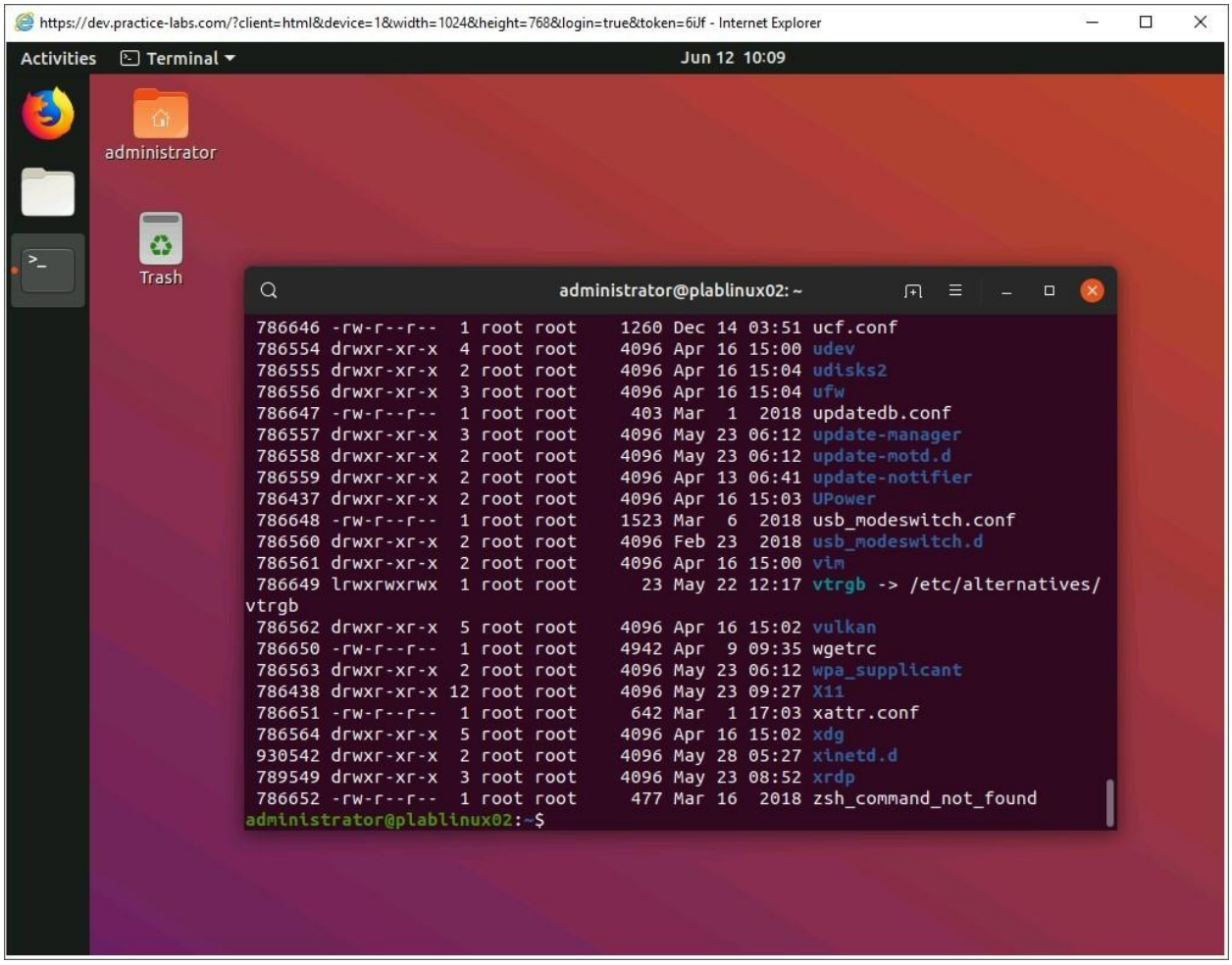

Figure 1.34 Screenshot of PLABLINUX02: Displaying the inode of multiple files in the /etc directory.

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

Review

Well done, you have completed the Using Various Disk Management Tools Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Using Various Disk Management Tools

You should now be able to:

- View filesystems (lsblk)
- View the content of a block device (blkid)
- Use disk partitioning tools (fdisk, parted)
- Use absolute and relative paths