

Create Partitions and Filesystems

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Introduction

Welcome to the **Create Partitions and Filesystems** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Partitions

Filesystems

MBR

GPT

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Create Partitions and Filesystems

After completing this lab, you will be able to:

- Manage MBR partition tables
- Manage GPT partition tables
- Create various filesystems

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI: 102.2** Install a boot manager
- **LPI: 104.1** Create partitions and filesystems

- **LPI:** 104.2 Maintain the integrity of the filesystem
- **CompTIA:** 1.1 Explain Linux boot process concepts
- **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

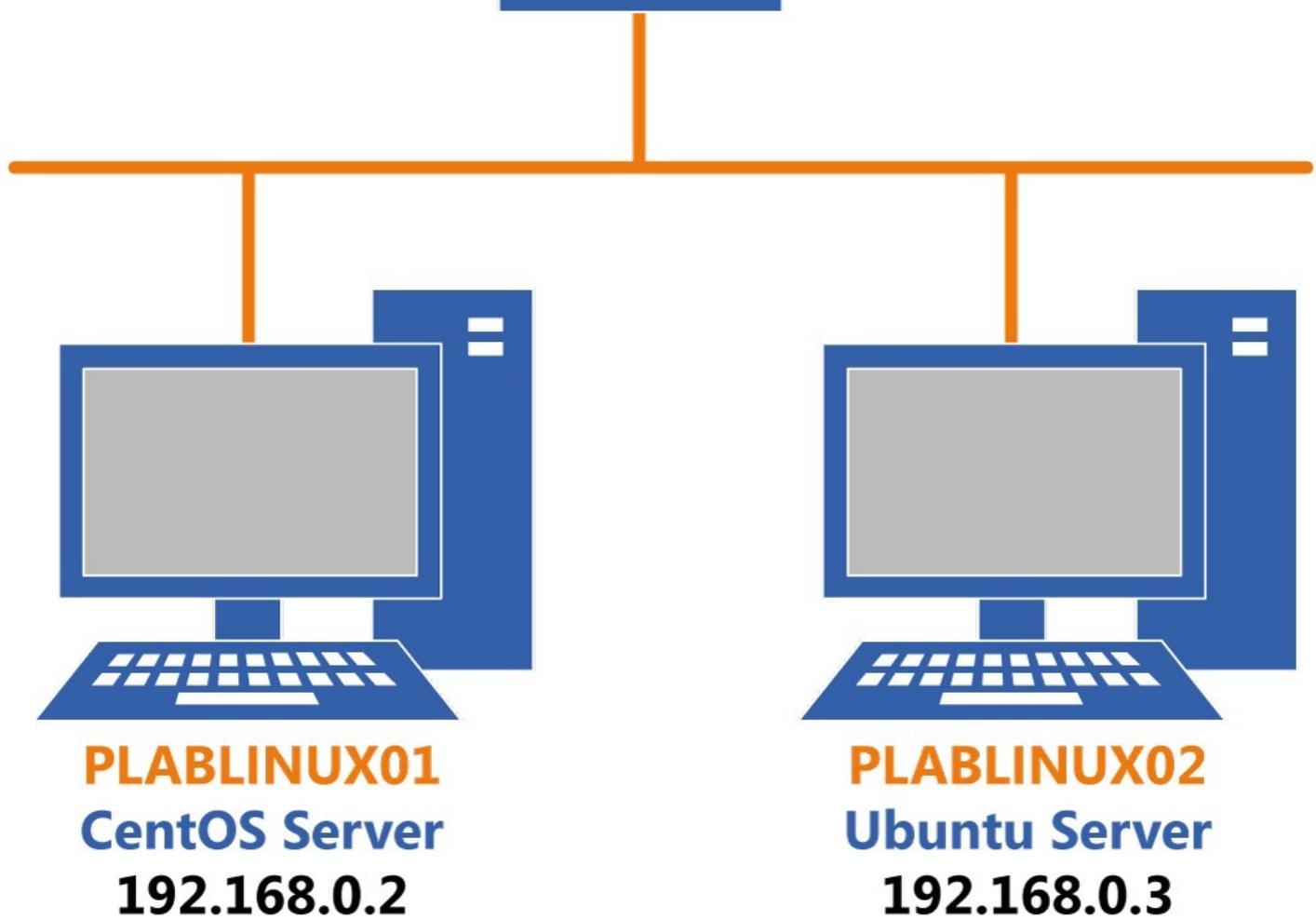
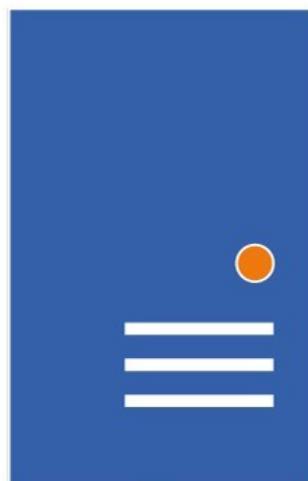
For more information on using Practice Labs, please see our **Help and Support** page. You can also raise a technical support ticket from this page.

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.

PLABSA01
Windows Server 2016
192.168.0.1



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- Create Partitions and Filesystems

The hard disk on a system must be partitioned before you can use it. Information about these partitions is recorded in the MBR (Master Boot Record) and GPT (GUID Partition Table) on the drive. In this exercise, you will understand how to create partitions and filesystems on a disk.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Manage MBR partition tables
- Manage GPT partition tables
- Create various filesystems

Your Devices

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

- **PLABLINUX02** (Ubuntu Server)



Task 1 - Manage MBR Partition Tables

Each hard disk contains one MBR partition. It is the first sector of the disk and is not large enough to hold more than four partitions. These partitions can be:

- Primary
- Extended

- Logical

There can be a variation on the number of primary and extended partitions that you can define. For example, you can have three primary partitions and one extended partition. Else, you can have one primary and one extended split into three logical partitions and many more.

To manage the MBR partition tables, 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.

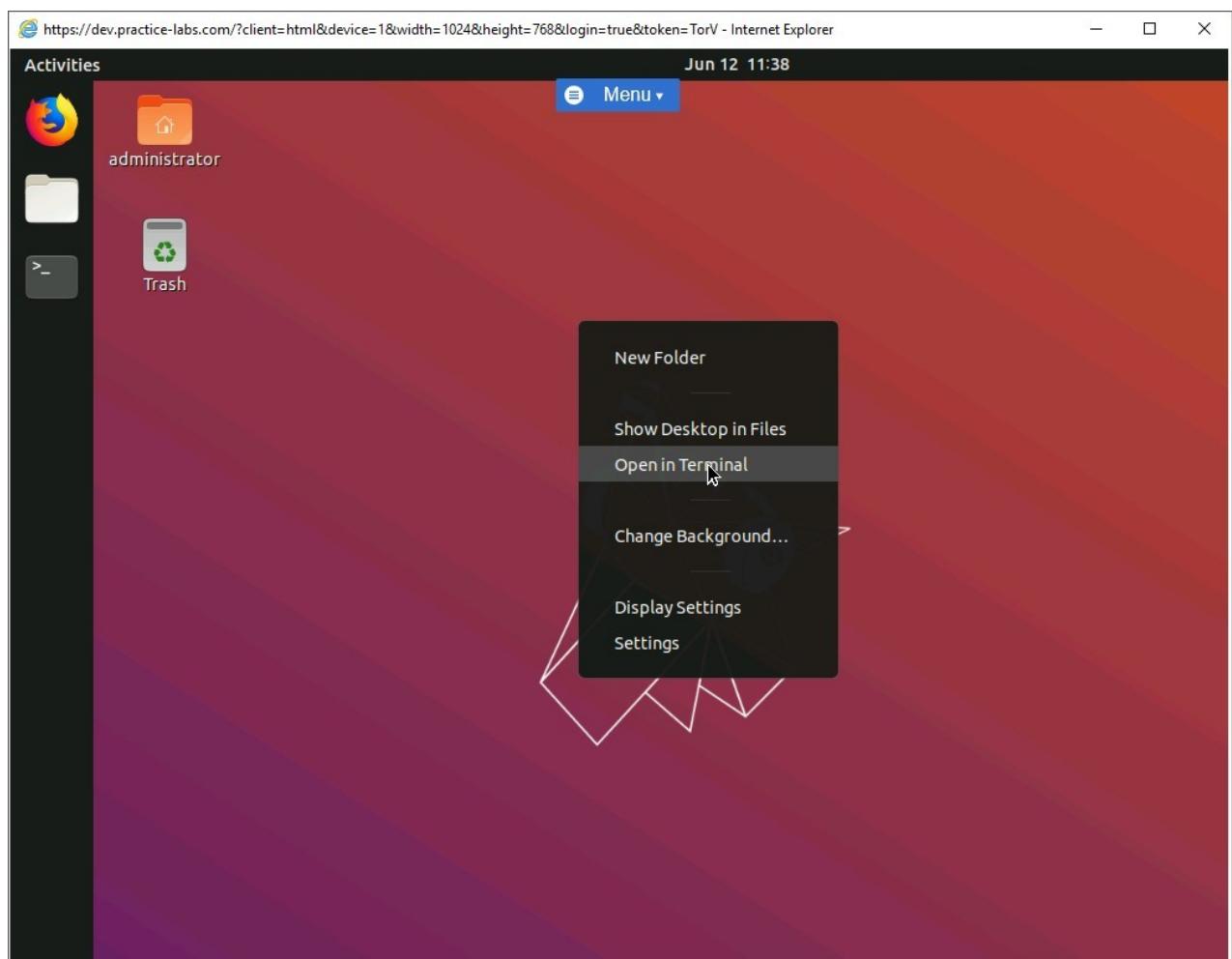


Figure 1.1 Screenshot of PLABLINUX02: Selecting the Open in Terminal option from the context menu.

Step 2

You can display the partition table using the parted command that shows you the boot partition and its type.

To display the partition table, type the following command:

```
sudo parted /dev/sda u s p
```

Press **Enter**.

u - An abbreviation for Unit command.

s - Refers to the unit Sector, this can be interchanged with the following: B, KiB, MiB, GiB, TiB, kB, MB, GB, TB, %, cyl, chs, compact.

p - An abbreviation for Print command.

When prompted for a password, type the following:

Passw0rd

Press **Enter**.

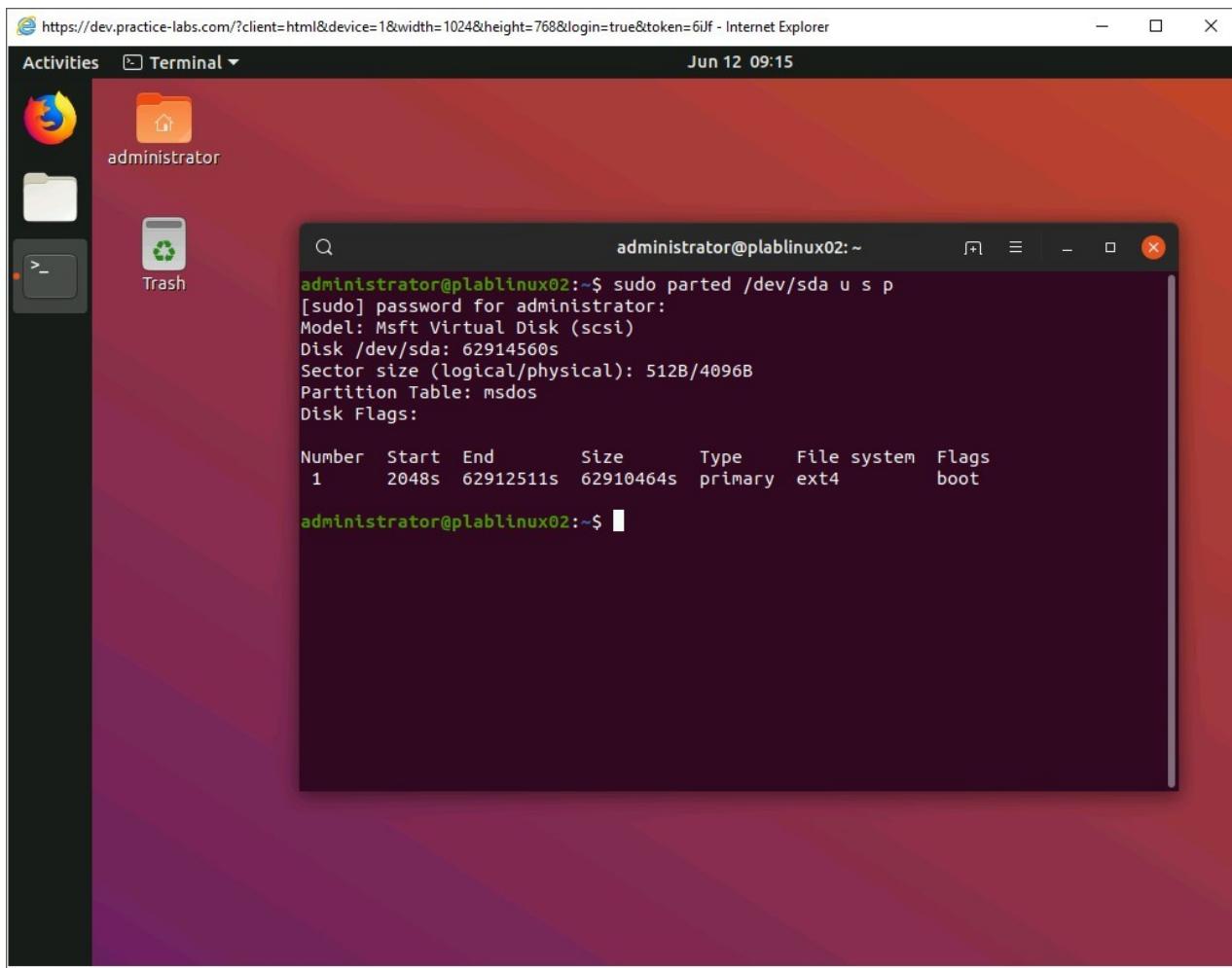


Figure 1.2 Screenshot of PLABLINUX02: Displaying the partition table of /dev/sda.

Step 3

You can also list the partitions using the **fdisk**.

To list the partitions, enter the following command:

```
sudo fdisk -l /dev/sda
```

The **-l** option in the command above lists the partitions on the **/dev/sda** device.

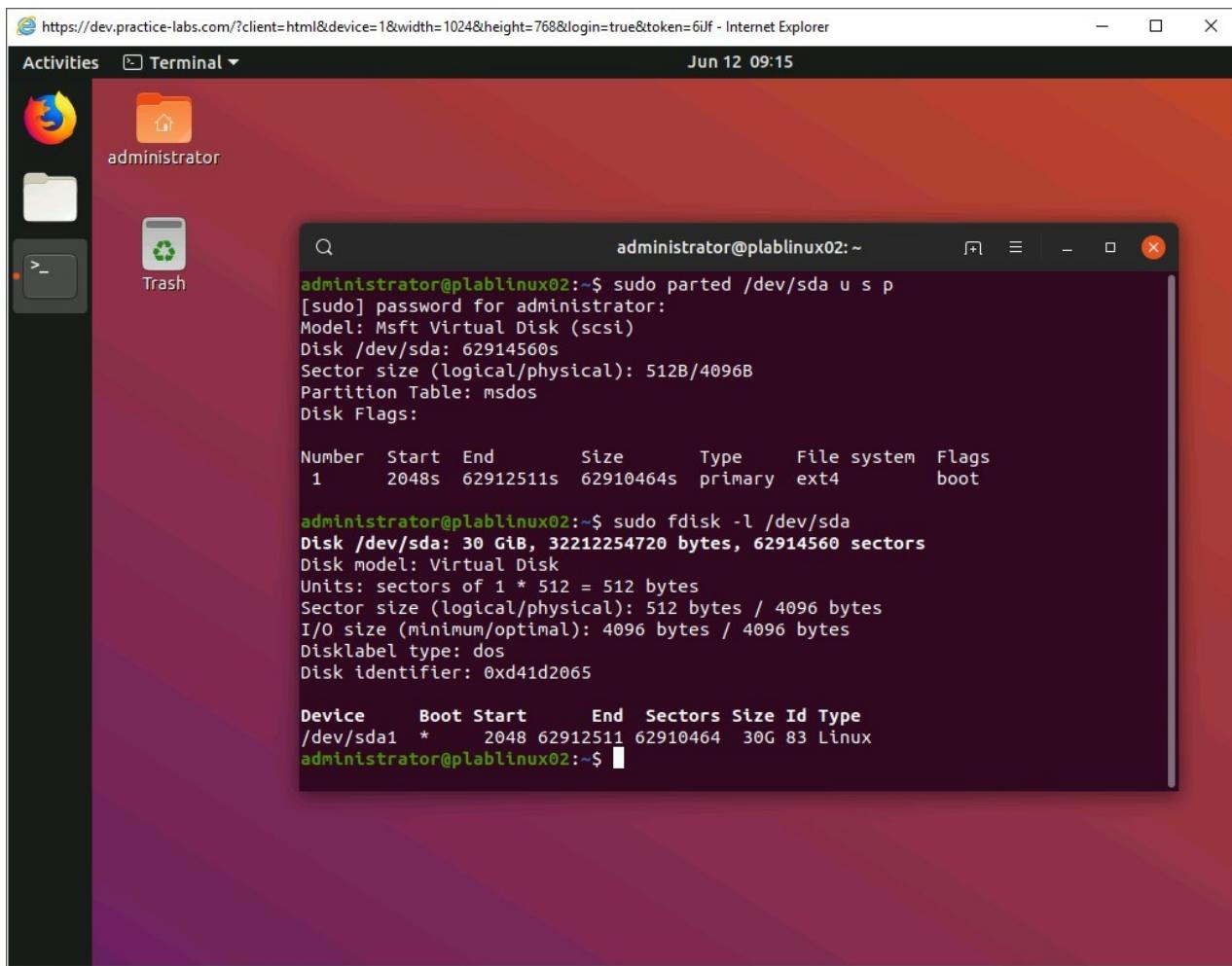


Figure 1.3 Screenshot of PLABLINUX02: Listing the partitions of /dev/sda.

Step 4

Clear the screen by entering the following command:

```
clear
```

You can also list the partitions using the **fdisk**.

To list the partitions, enter the following command:

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

The **-l** option in the command above lists the partitions on the **/dev/sda** device.

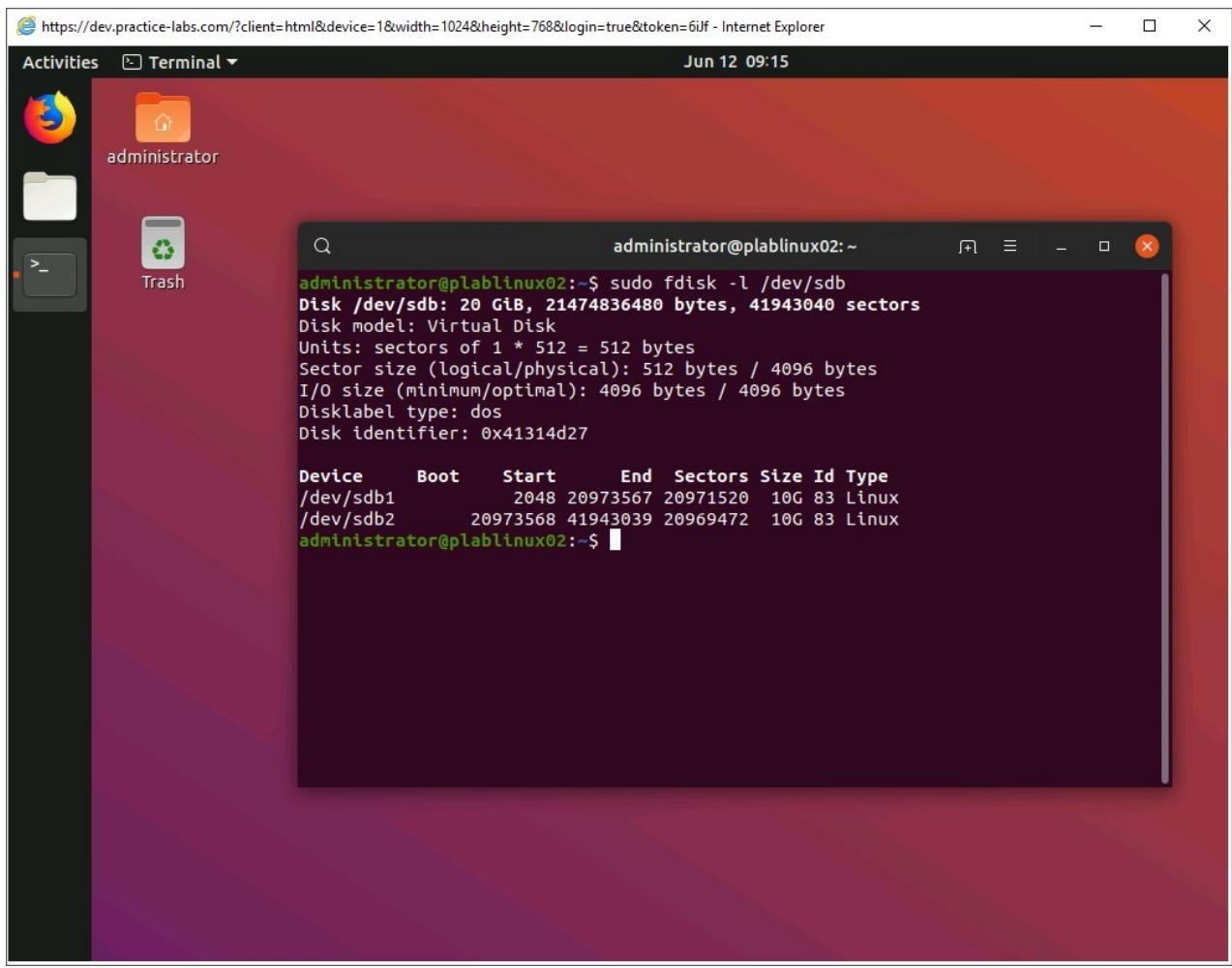


Figure 1.4 Screenshot of PLABLINUX02: Listing the partitions of /dev/sdb.

Step 5

Clear the screen by entering the following command:

```
clear
```

Using the **fdisk** command, you can also create or remove partitions from a device, such as **/dev/sdb**.

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

This command displays the list of options to work with partitions on the **/dev/sdb** device.

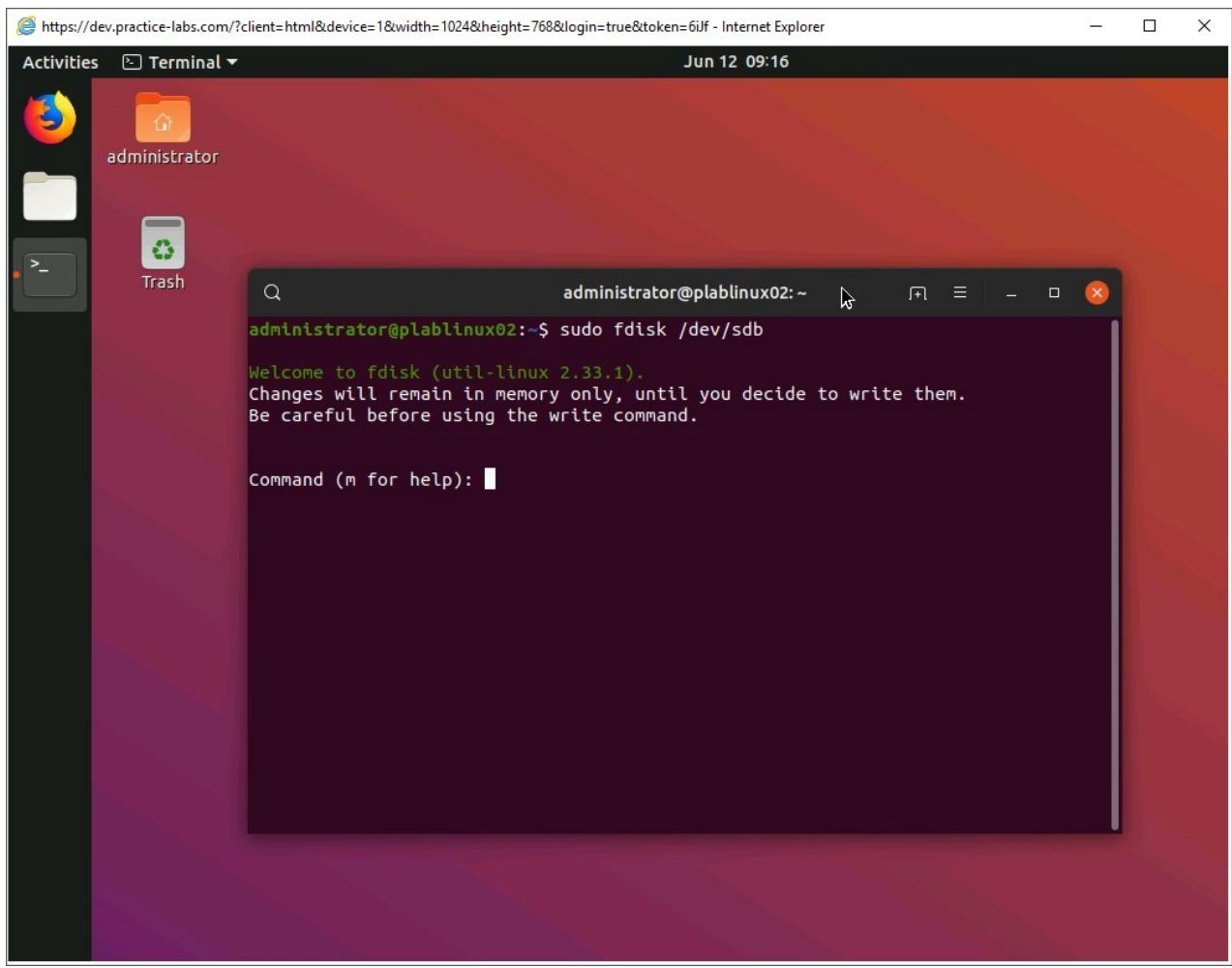


Figure 1.5 Screenshot of PLABLINUX02: Displaying the options of the fdisk command.

Step 6

To see the list of options, type the following:

```
m
```

Press **Enter**.

A number of options are displayed.

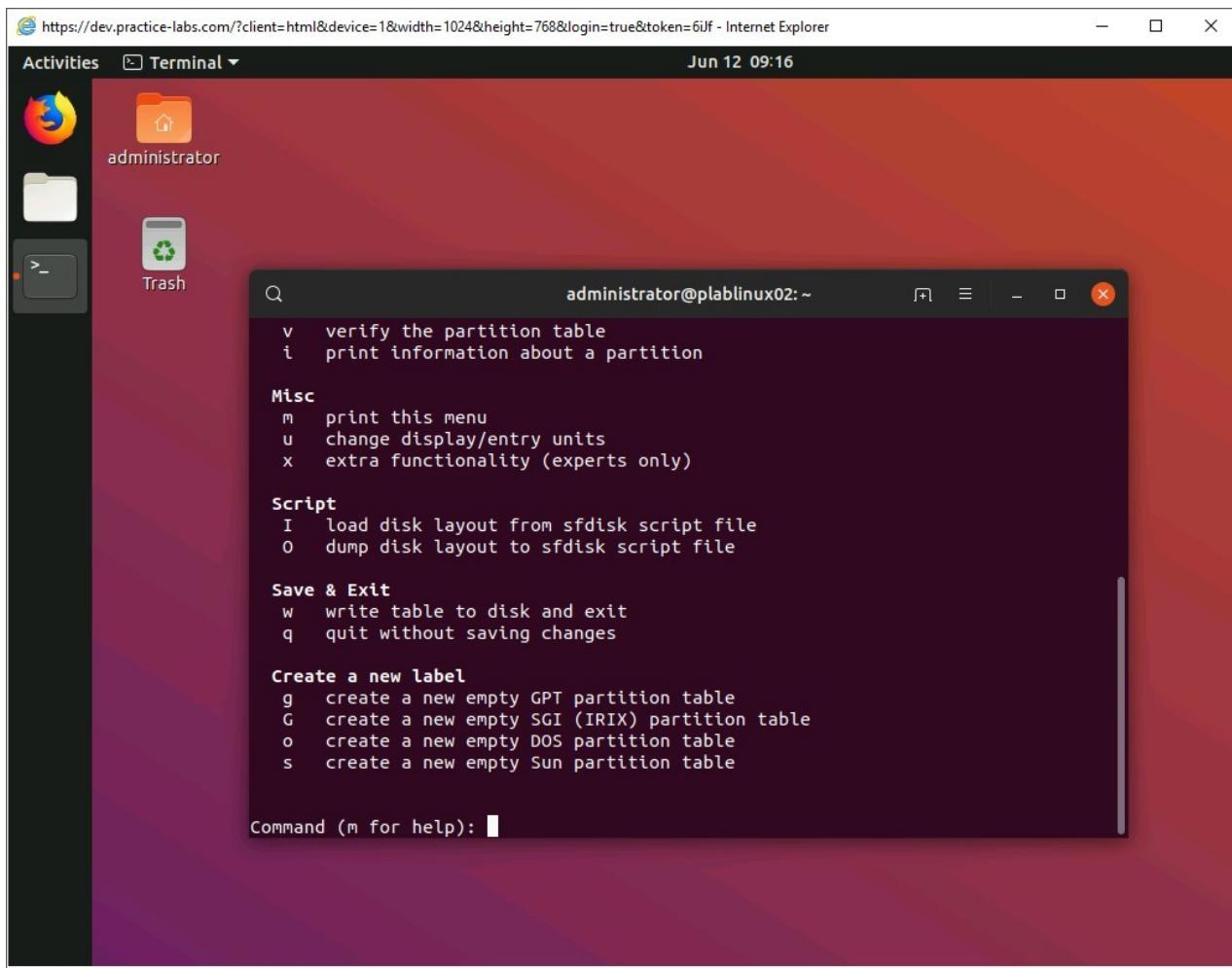


Figure 1.6 Screenshot of PLABLINUX02: Listing the fdisk menu options.

Step 7

To display the existing partition table, type the following:

p

Press **Enter**.

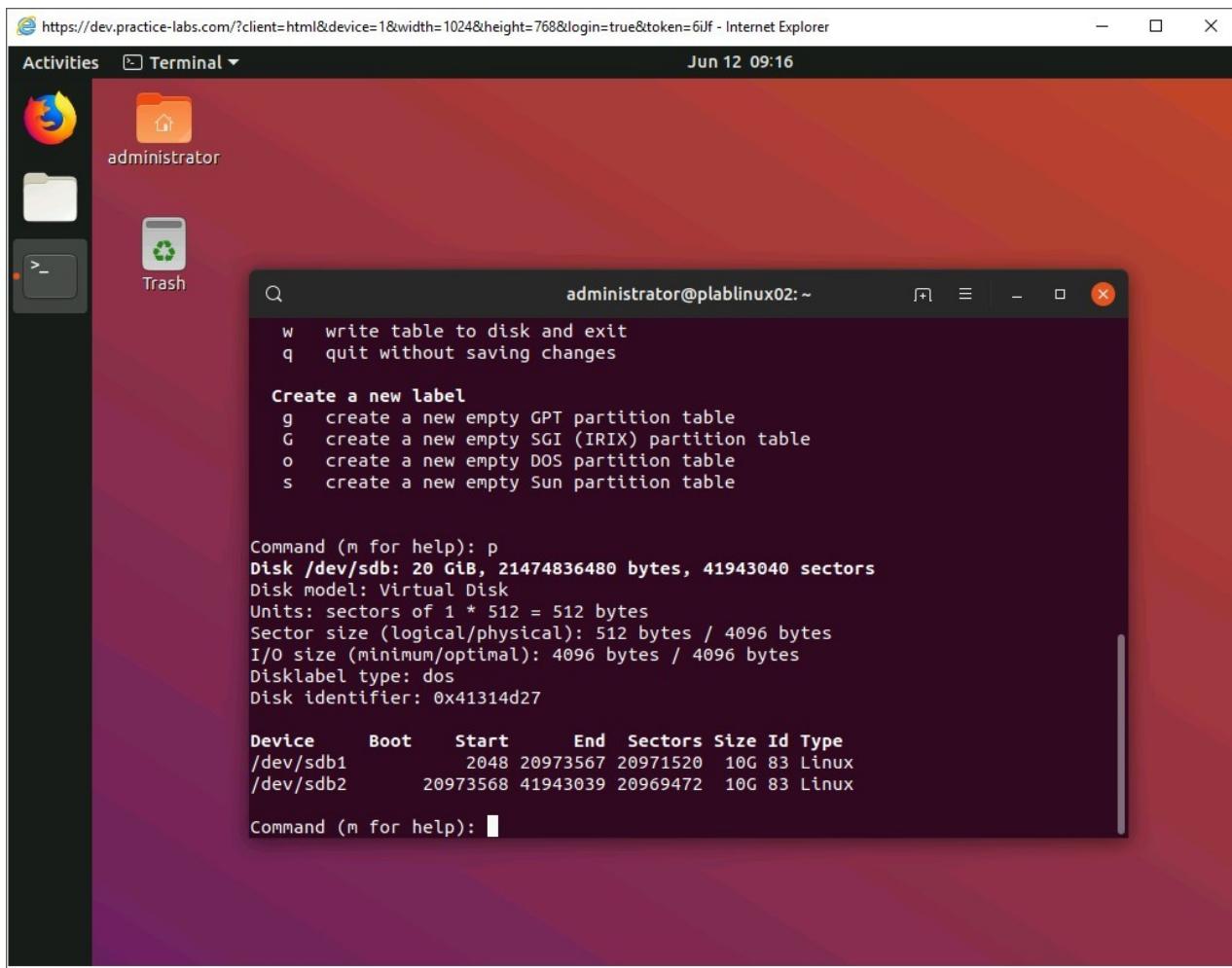


Figure 1.7 Screenshot of PLABLINUX02: Printing the existing partition information.

Step 8

Currently, the disk has two partitions and no free space. You will first delete a partition and then create a new partition. To delete a partition, type the following:

d

Press **Enter**.

When prompted for the partition number, type the following number:

2

Press **Enter**.

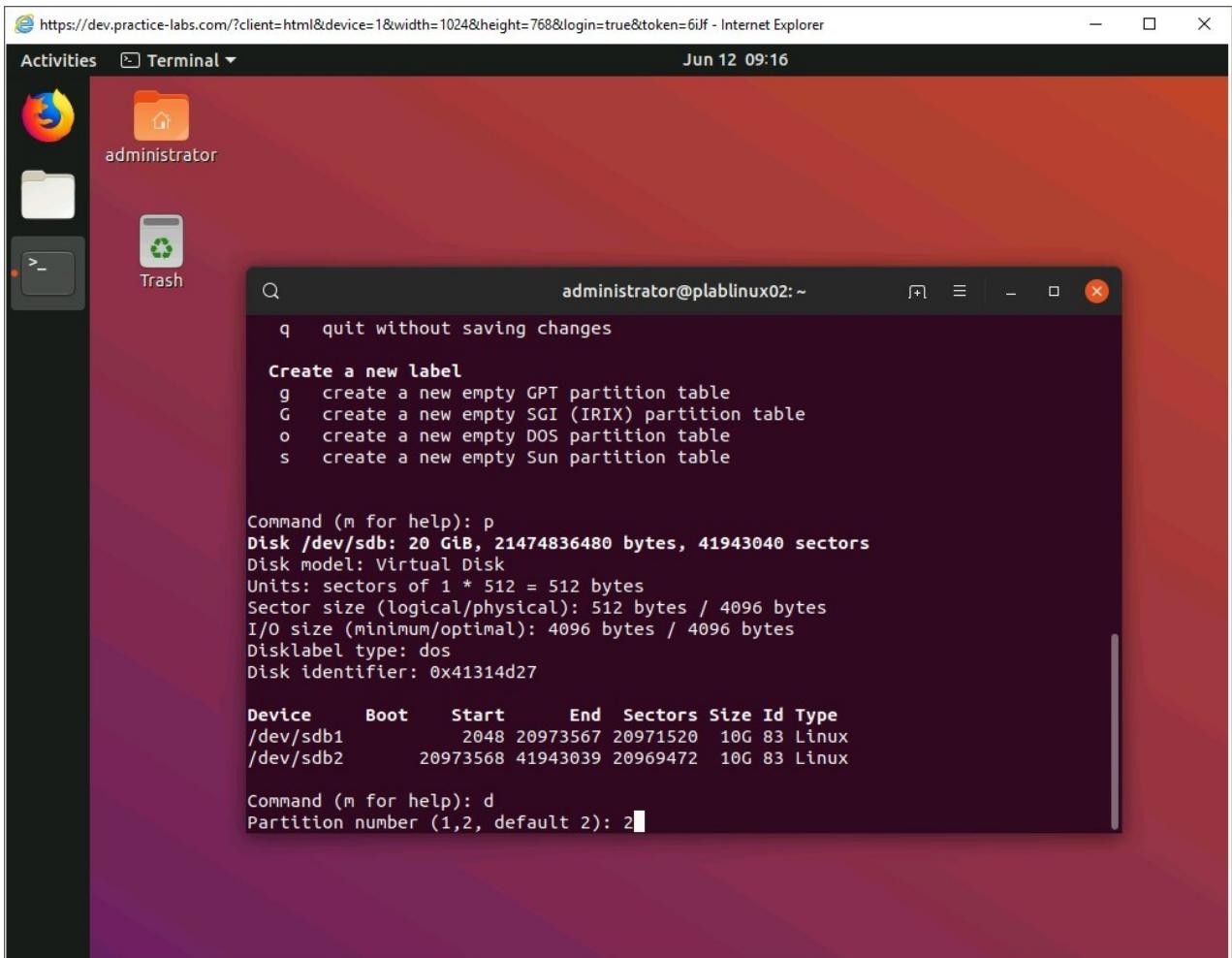


Figure 1.8 Screenshot of PLABLINUX02: Deleting a partition.

Step 9

You are prompted with the message that the partition has been deleted. To display the existing partition table, type the following:

```
p
```

Press **Enter**.

Notice that only one partition is now left.

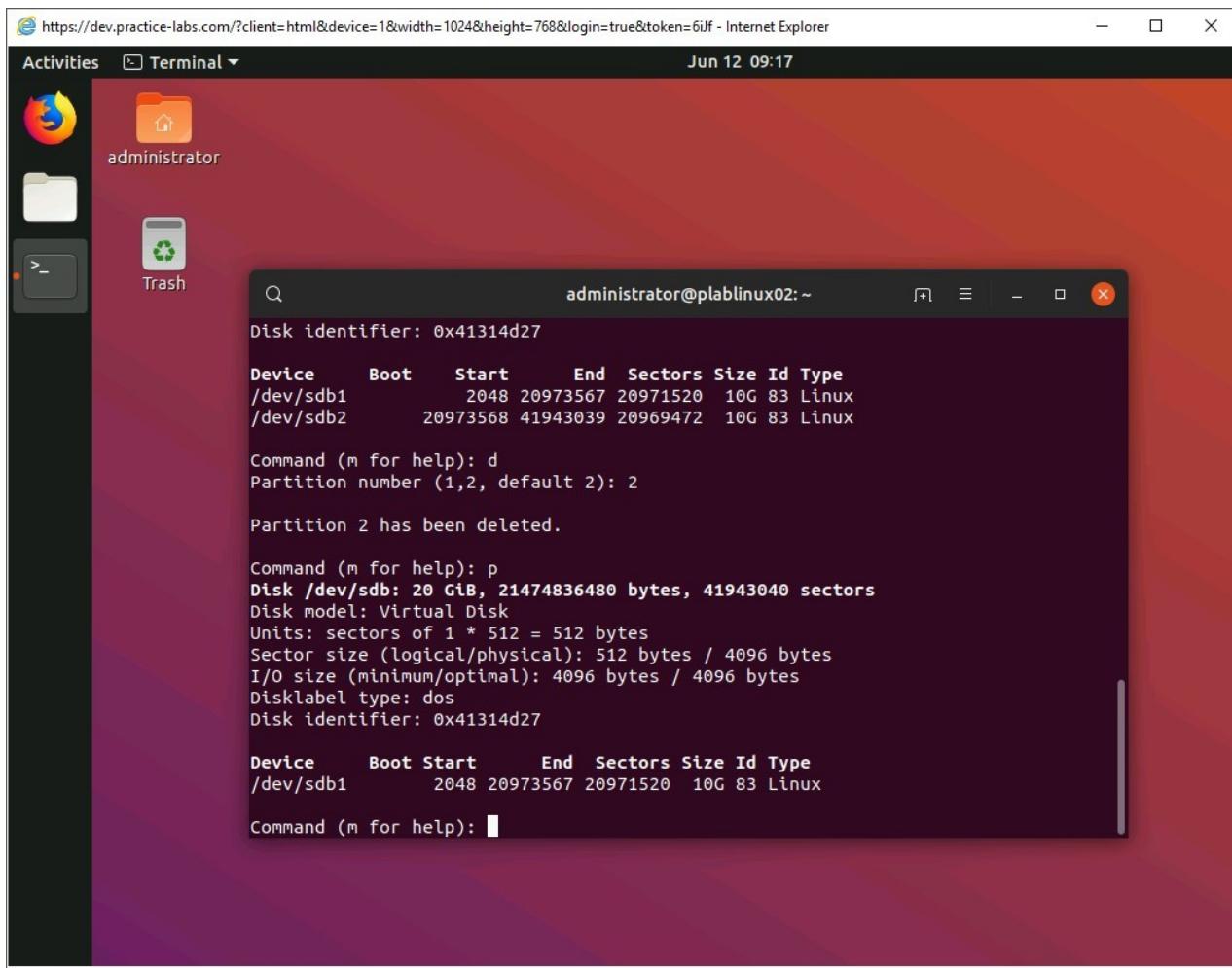


Figure 1.9 Screenshot of PLABLINUX02: Printing the existing partition information.

Step 10

You will now create a new partition. Type the following:

```
n
```

Press **Enter**. You will be prompted to specify whether the partition needs to be a primary or an extended partition.

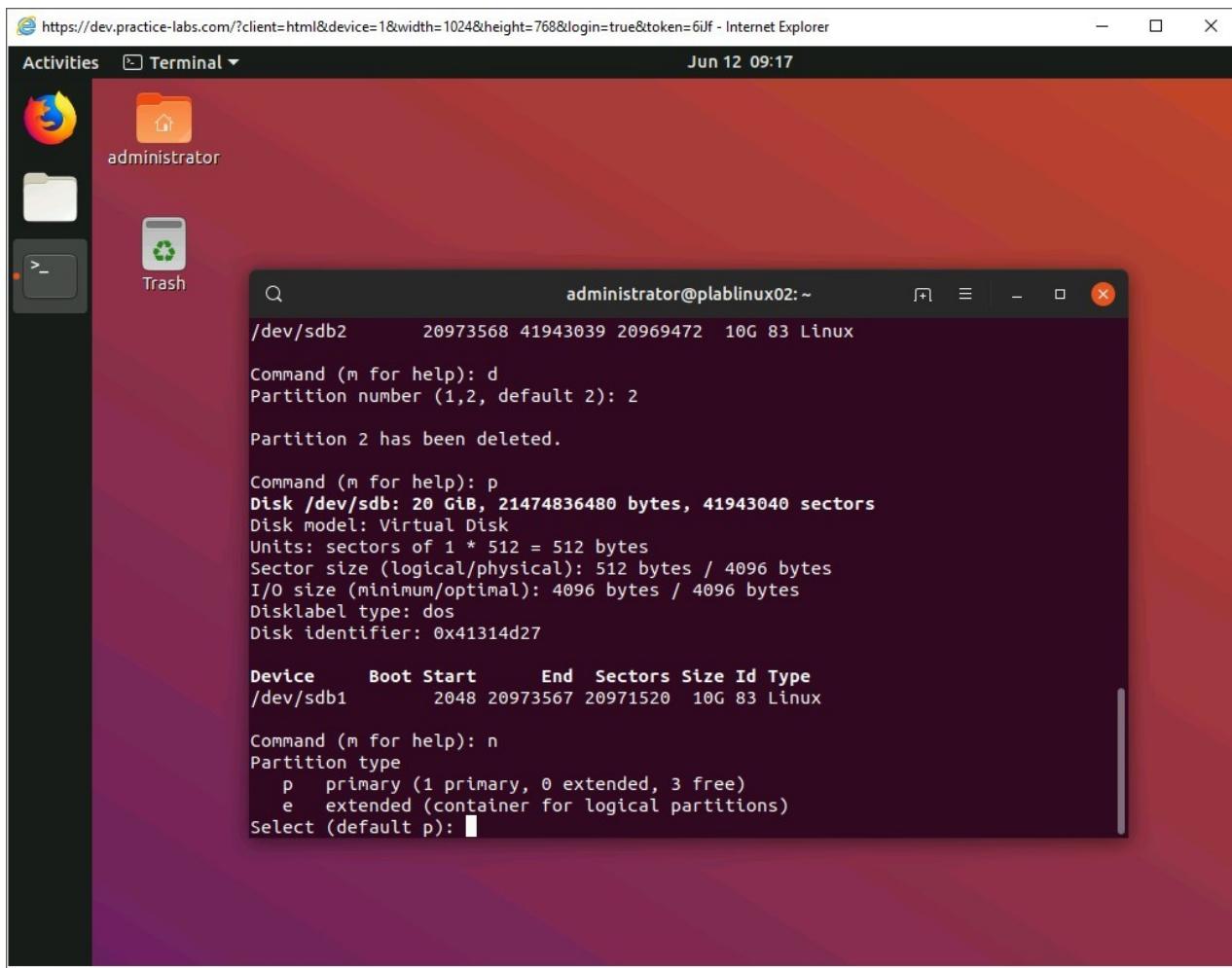


Figure 1.10 Screenshot of PLABLINUX02: Creating a new partition.

Step 11

To create a primary partition, type the following:

p

Press **Enter**.

You will now be prompted to enter the partition number.

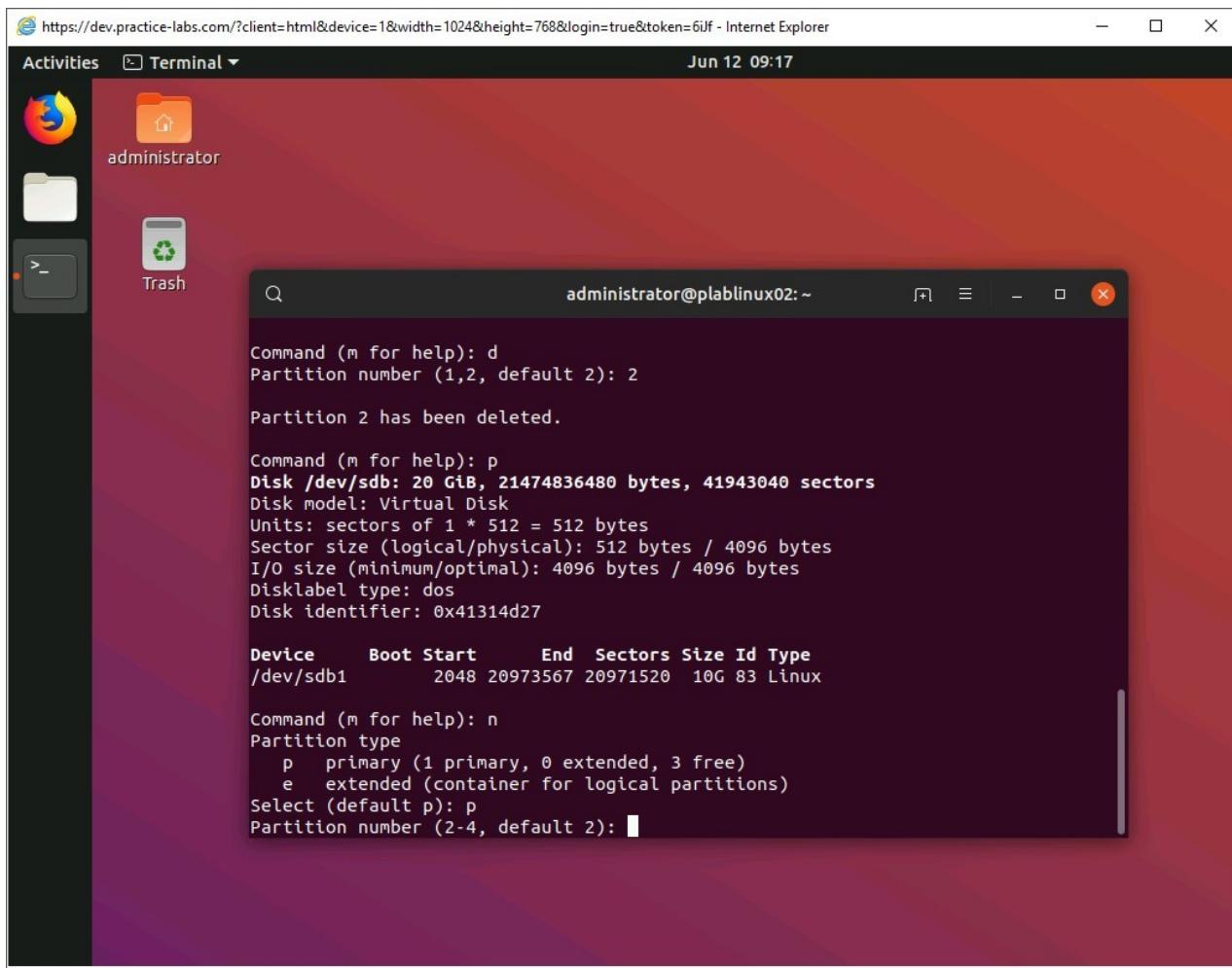


Figure 1.11 Screenshot of PLABLINUX02: Selecting the primary partition to be created.

Step 12

To enter the partition number, type the following number:

2

Press **Enter**. You will now be prompted to enter the first sector.

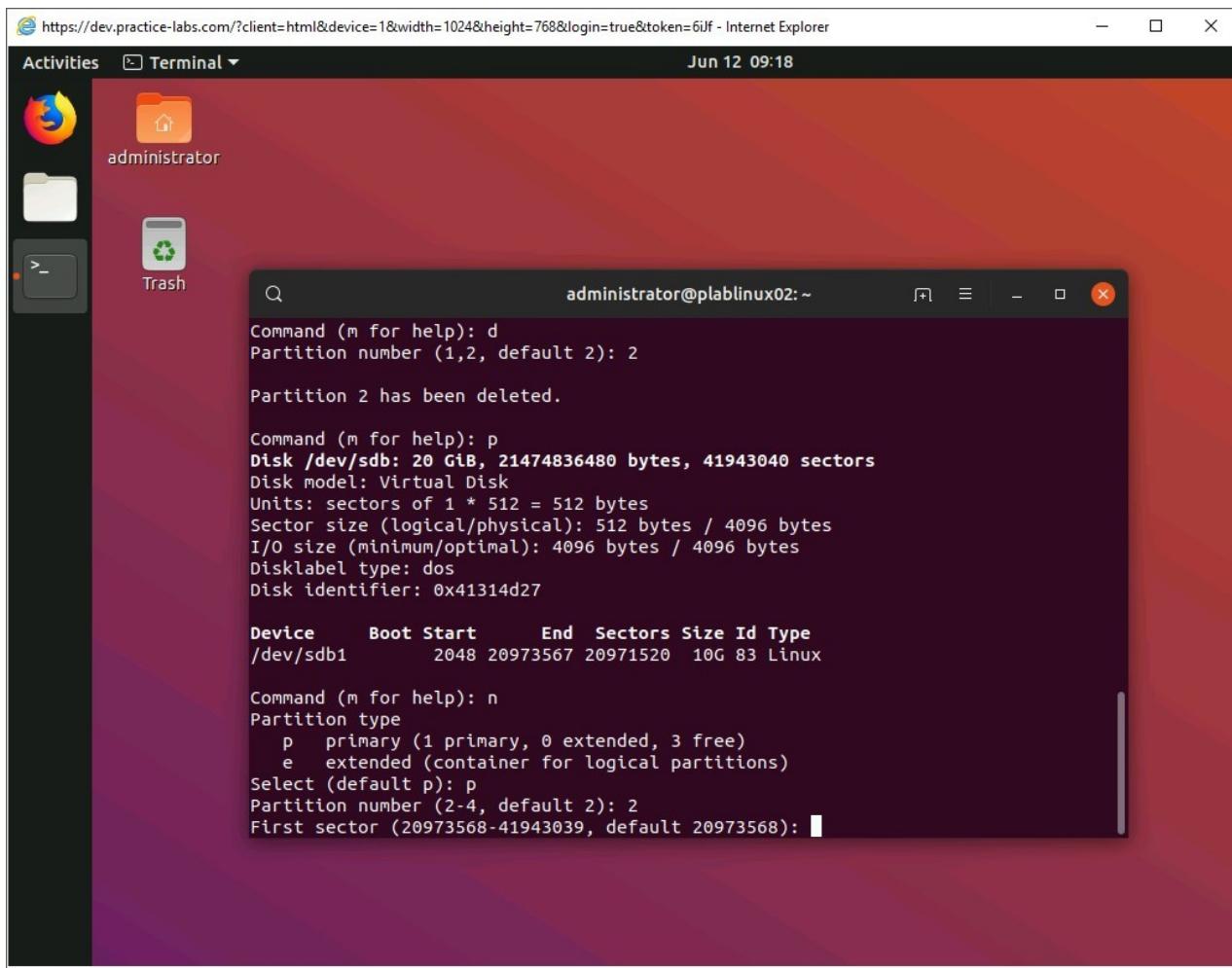


Figure 1.12 Screenshot of PLABLINUX02: Entering the partition number option.

Step 13

You can accept the default value as the first sector. To do this, press **Enter**.

Note: You can enter any number. However, it is suggested that you should enter the first sector of the disk to start with. Else, you waste this space.

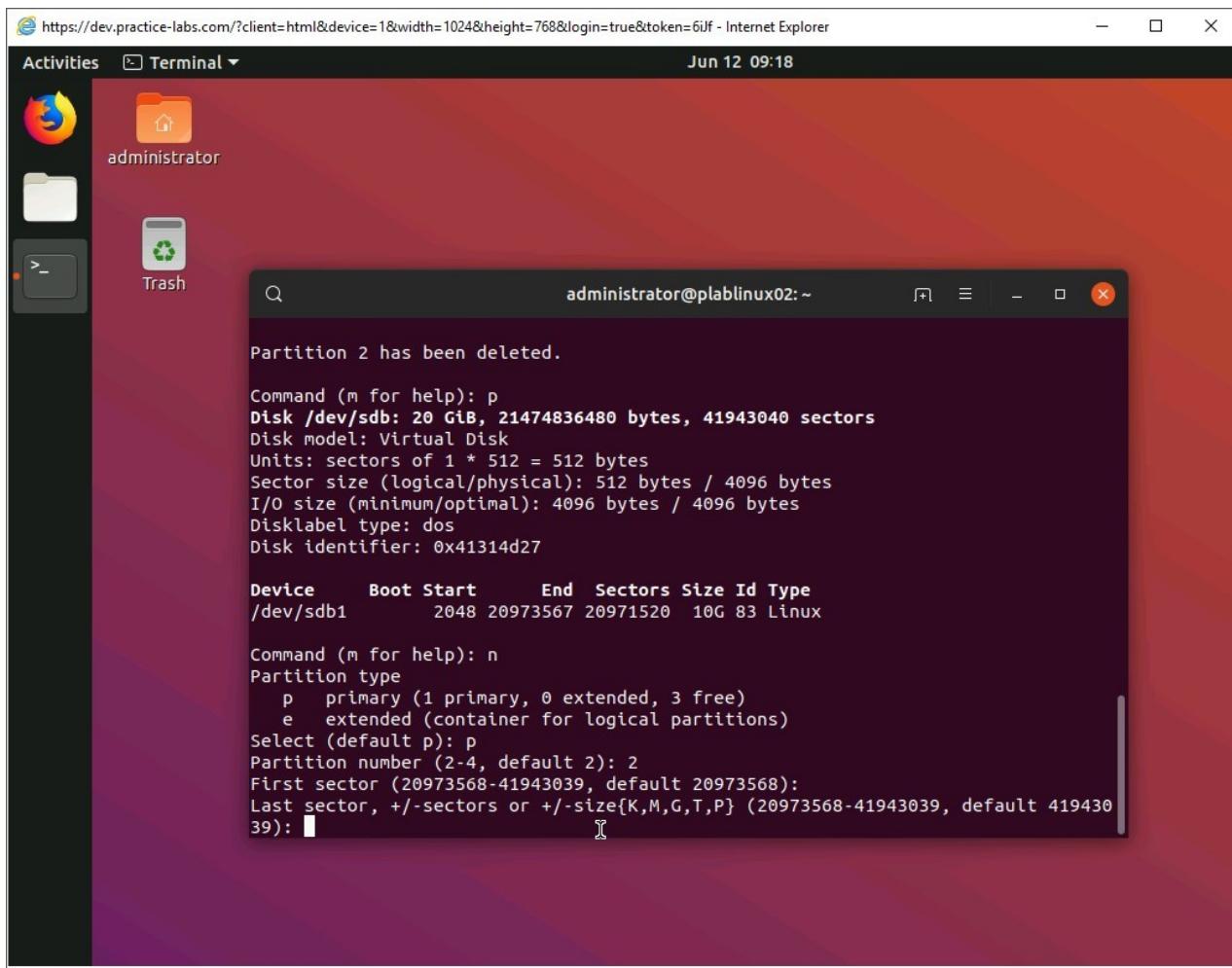


Figure 1.13 Screenshot of PLABLINUX02: Accepting the default values as the first sector.

Step 14

You can accept the default value as the last sector. However, for this task, type the following:

35000000

Press **Enter**. You will then be prompted to remove the signature.

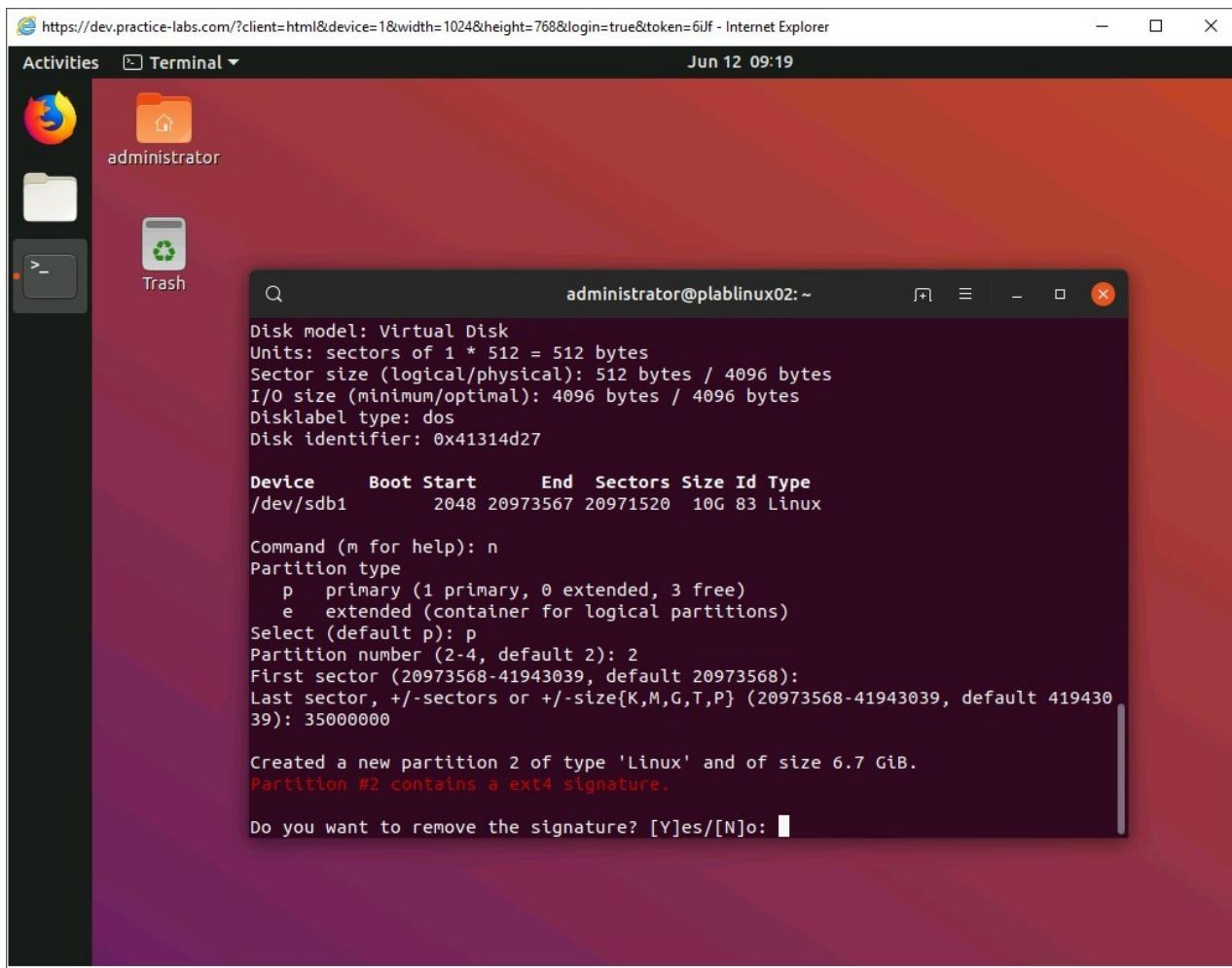


Figure 1.14 Screenshot of PLABLINUX02: Defining the last sector of the partition.

Step 15

You are prompted that the disk contains the ext4 signature. Type the following:

Y

Press **Enter**.

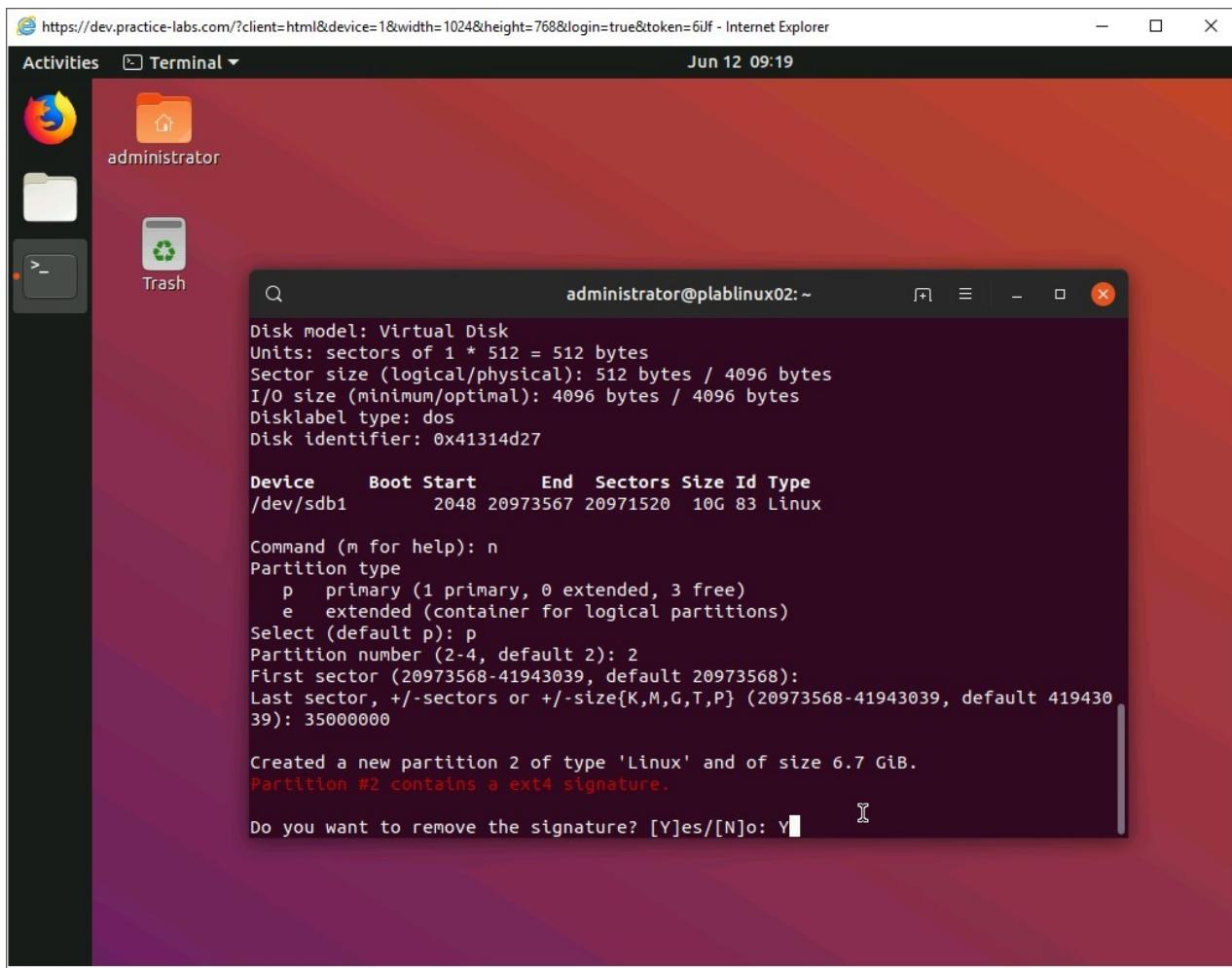


Figure 1.15 Screenshot of PLABLINUX02: Accepting the existing ext4 signature.

Step 16

Till this point, you have created a partition table in the memory. To save the table, you write the table to the memory of the device. To write the partition table, type the following:

W

Press **Enter**.

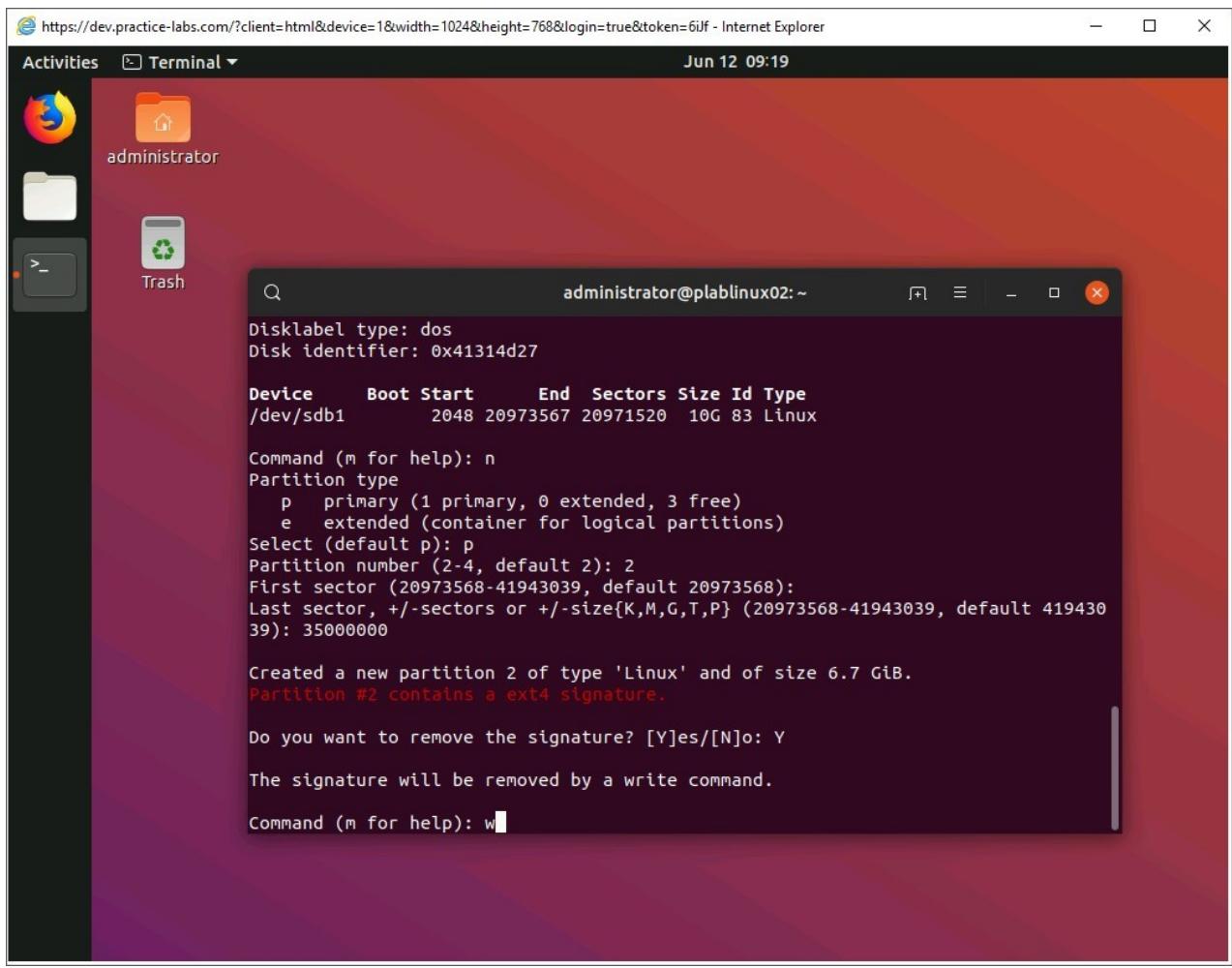


Figure 1.16 Screenshot of PLABLINUX02: Writing the partition information.

Step 17

Notice that you are prompted with an error. This is because the **/dev/sdb** disk is in use.

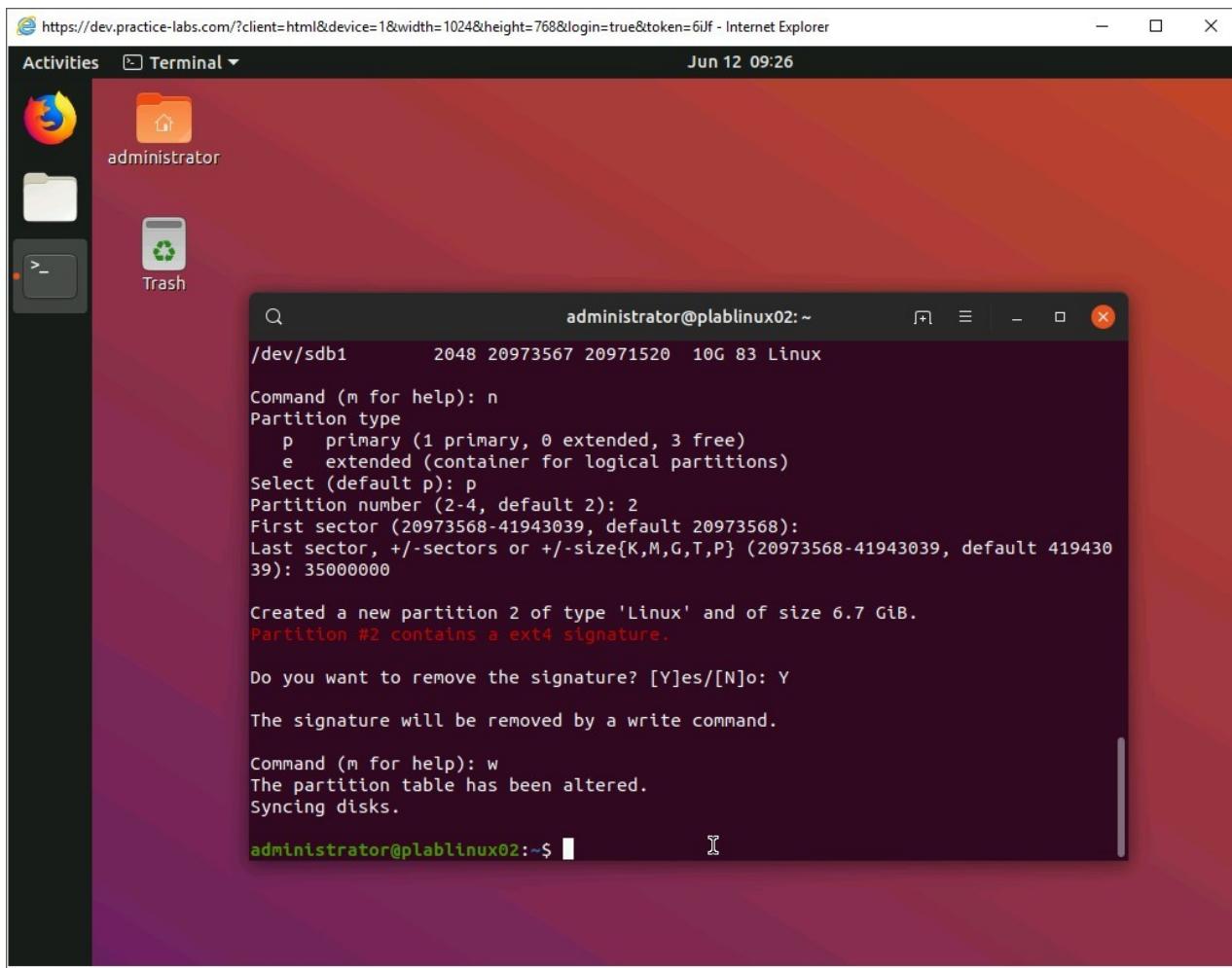


Figure 1.17 Screenshot of PLABLINUX02: Confirming the writing of partition information.

Step 18

To verify that the new partition table is now created and there is a new partition on **/dev/sdb**, enter the following command:

```
sudo fdisk -l
```

Note that the details of the partition are displayed in the output.

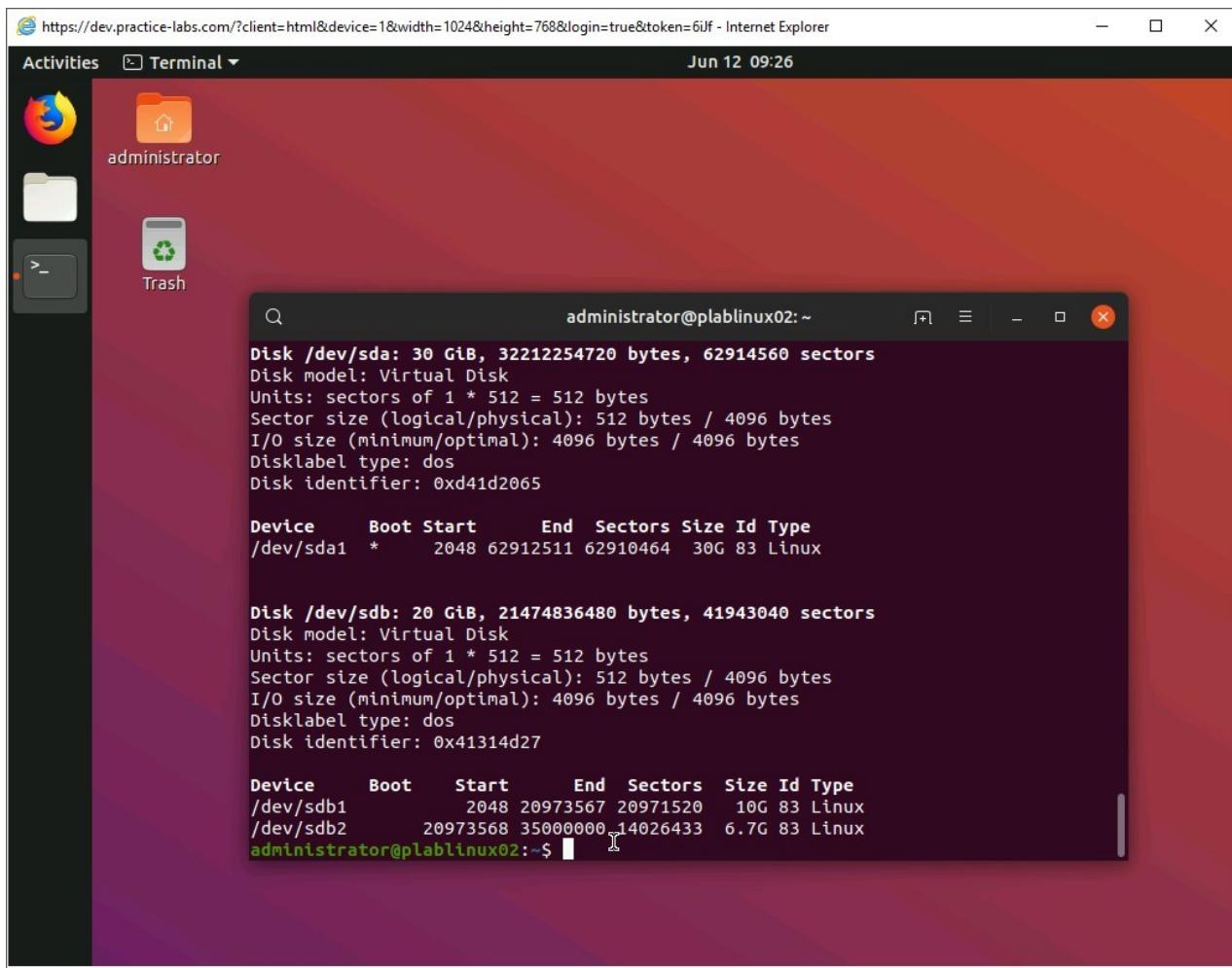


Figure 1.18 Screenshot of PLABLINUX02: Listing the partitions.

Task 2 - Manage GPT Partition Tables

GPT is the latest standard for defining the partitions on a hard disk. GPT uses globally unique identifiers (GUID) to define the partition, and you can create theoretically unlimited partitions on the hard disk. In this task, you will create and access a GPT table on the /dev/sdb device.

To manage GPT tables, perform the following tasks:

Step 1

Clear the screen by entering the following command:

```
clear
```

You can use the **gdisk** command to create a **GUID Partition Table (GPT)** and a partition. To create a GUID Partition Table, type the following command:

```
sudo gdisk /dev/sdb
```

Press **Enter**. You will need to enter an option to proceed.

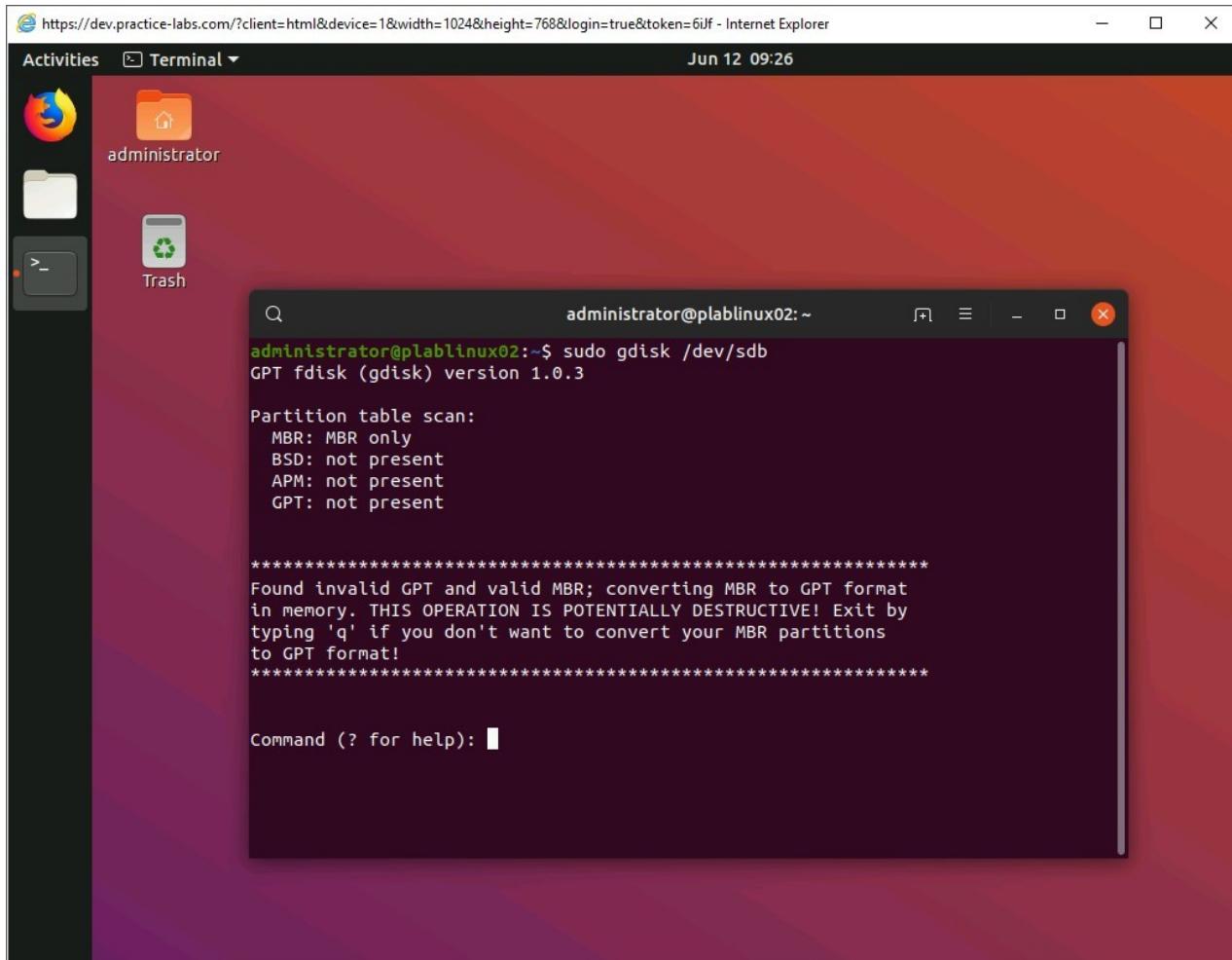


Figure 1.19 Screenshot of PLABLINUX02: Creating a GUID Partition Table.

Step 2

To create a new partition, type the following:

```
n
```

Press **Enter**.

You will now be prompted to enter the partition number.

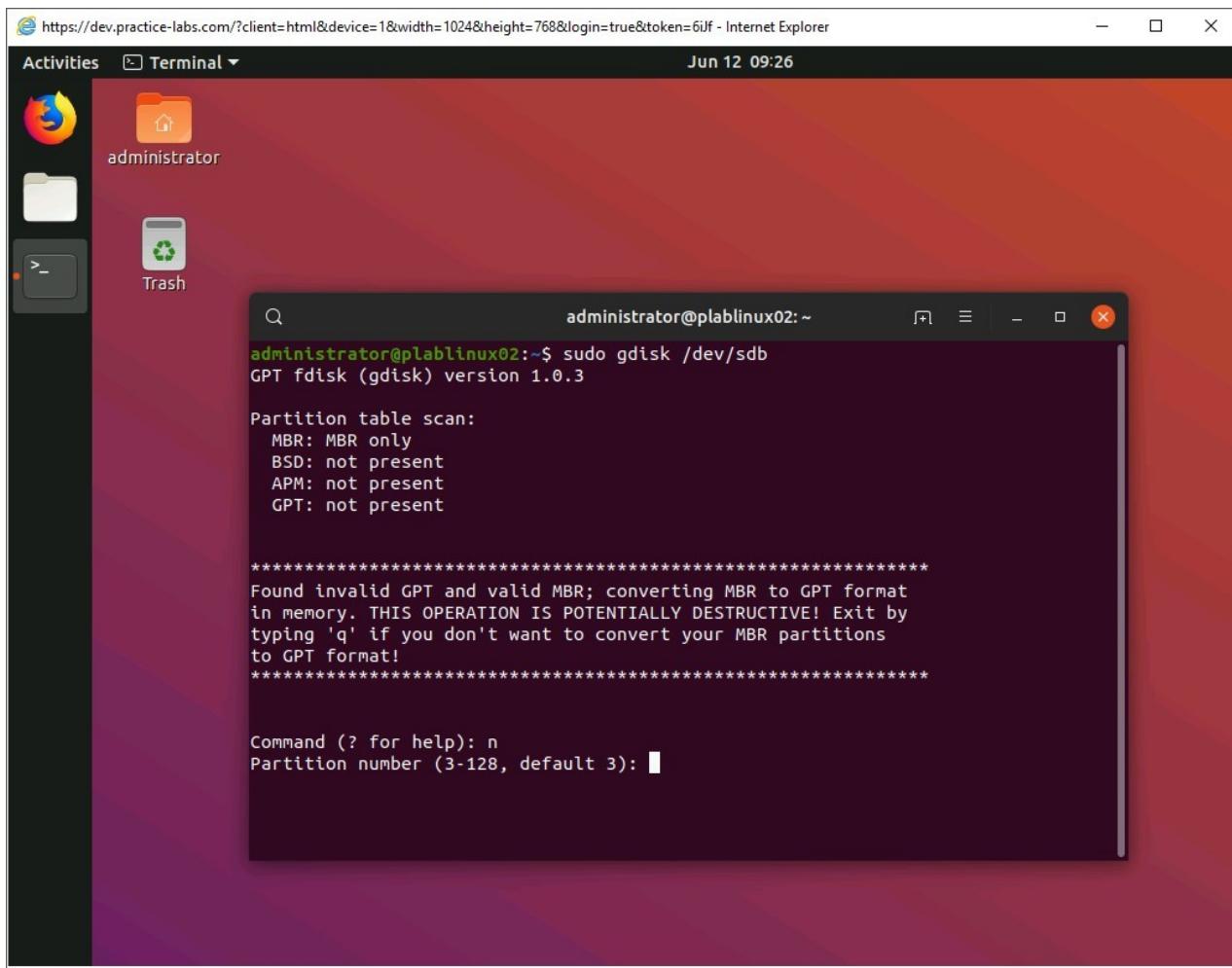


Figure 1.20 Screenshot of PLABLINUX02: Creating a new partition.

Step 3

For this task, type the partition number as:

3

Press **Enter**.

You will now be asked for the first sector. Press **Enter** to accept the default.

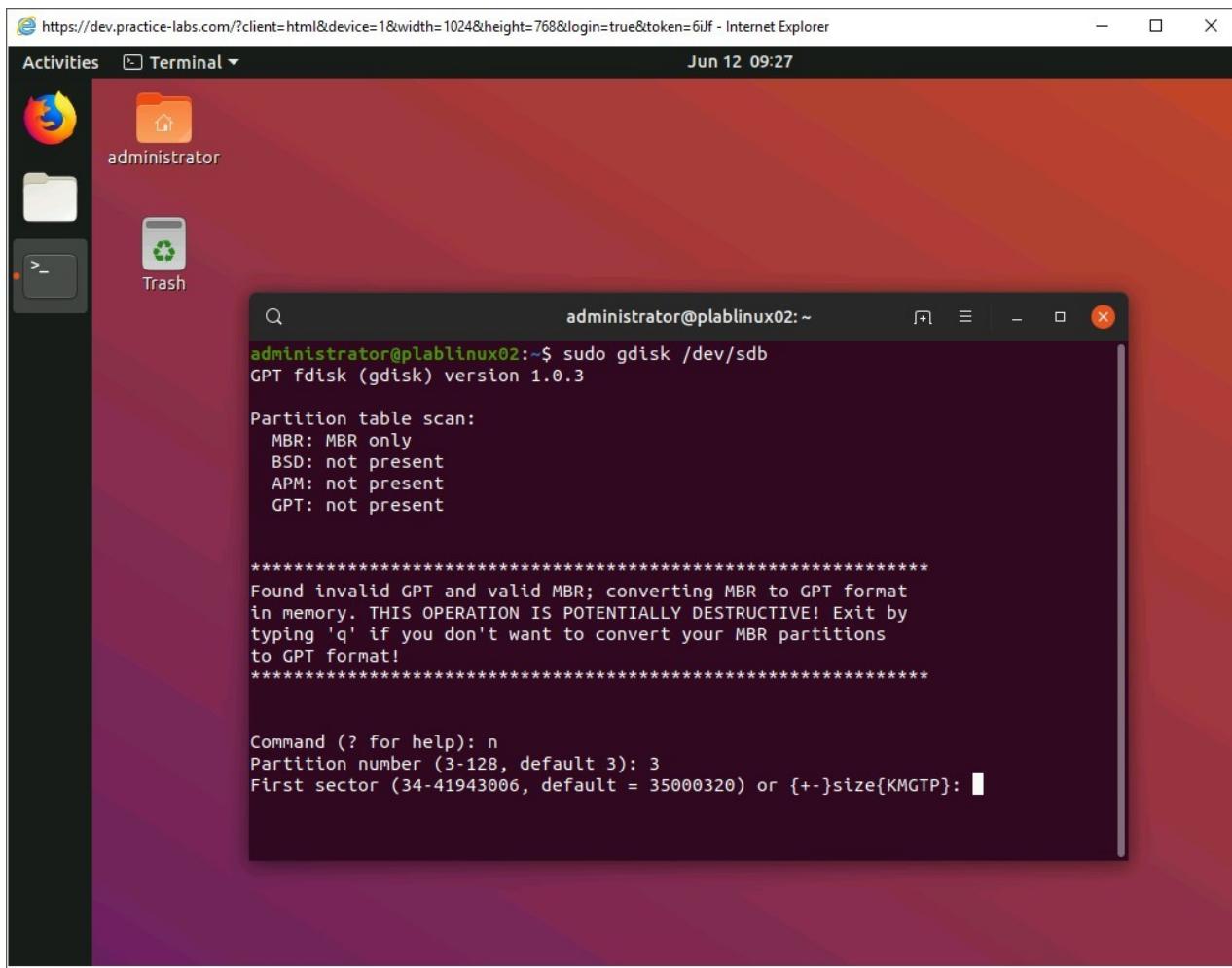


Figure 1.21 Screenshot of PLABLINUX02: Setting the partition number.

Step 4

You will now be prompted for the last sector. Press **Enter** to accept the default.

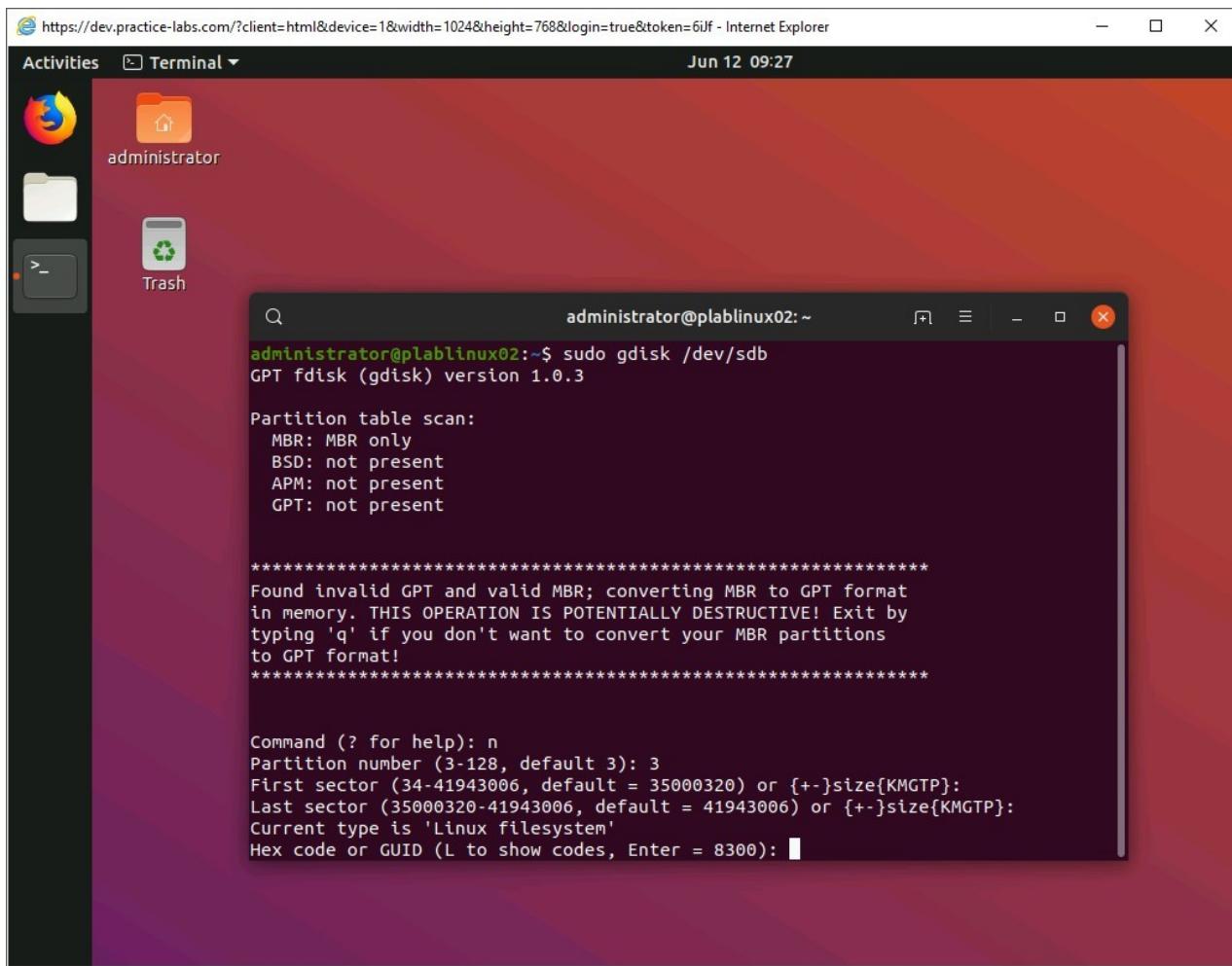


Figure 1.22 Screenshot of PLABLINUX02: Accepting the default last sector of the partition.

Step 5

To define **GUID**, type the following:

8300

Press **Enter**.

Note: The command indicates that pressing enter with nothing entered will accept the suggested default of 8300, this results in a Linux filesystem.

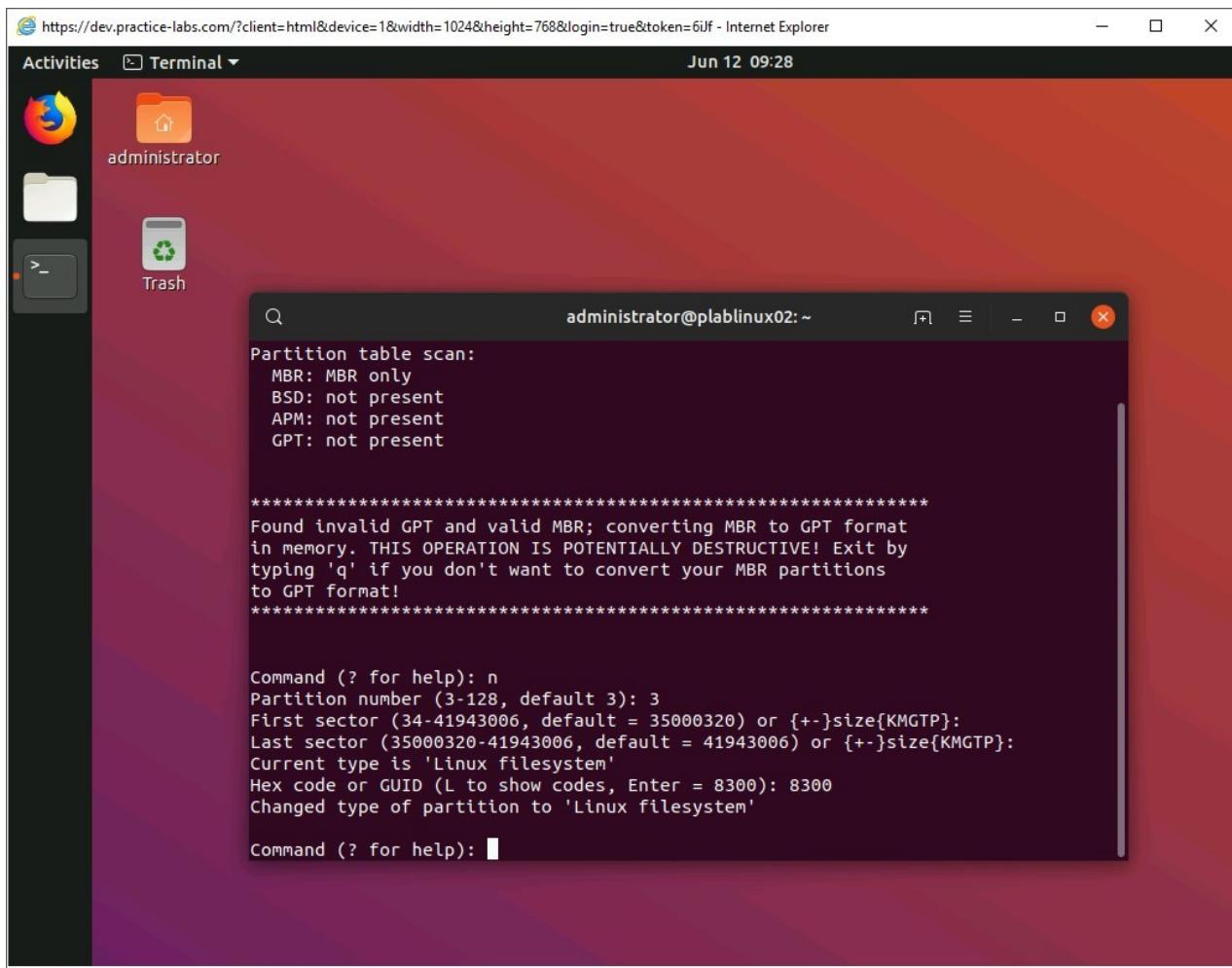


Figure 1.23 Screenshot of PLABLINUX02: Defining the GUID for the partition.

Step 6

On the next prompt, to print the partitions, type the following:

```
p
```

Press **Enter**.

Notice that details of both the partitions created till now are listed.

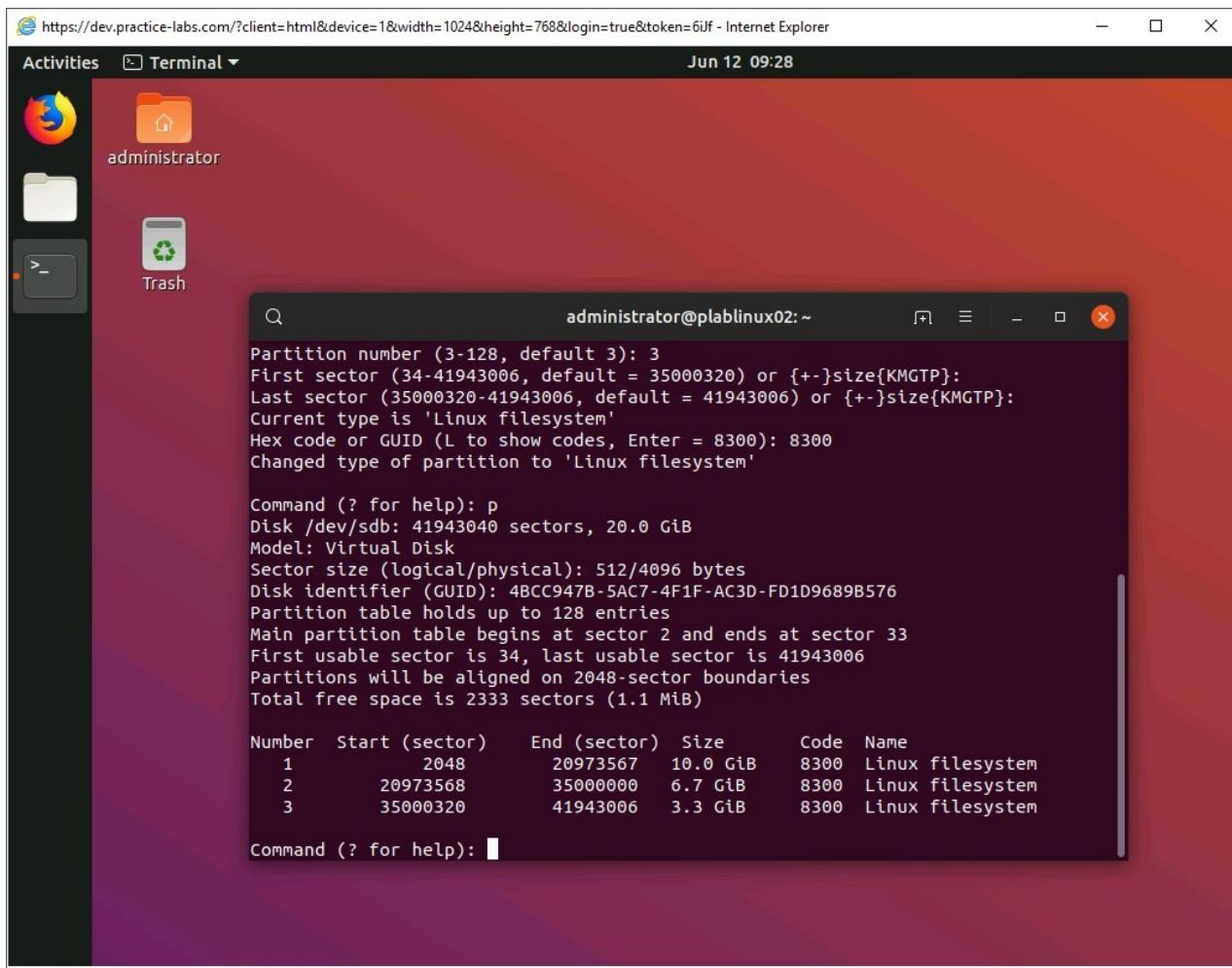


Figure 1.24 Screenshot of PLABLINUX02: Printing the partition information.

Step 7

Type the following to write the partitions:

W

Press **Enter**.

You will be prompted to confirm your choice.

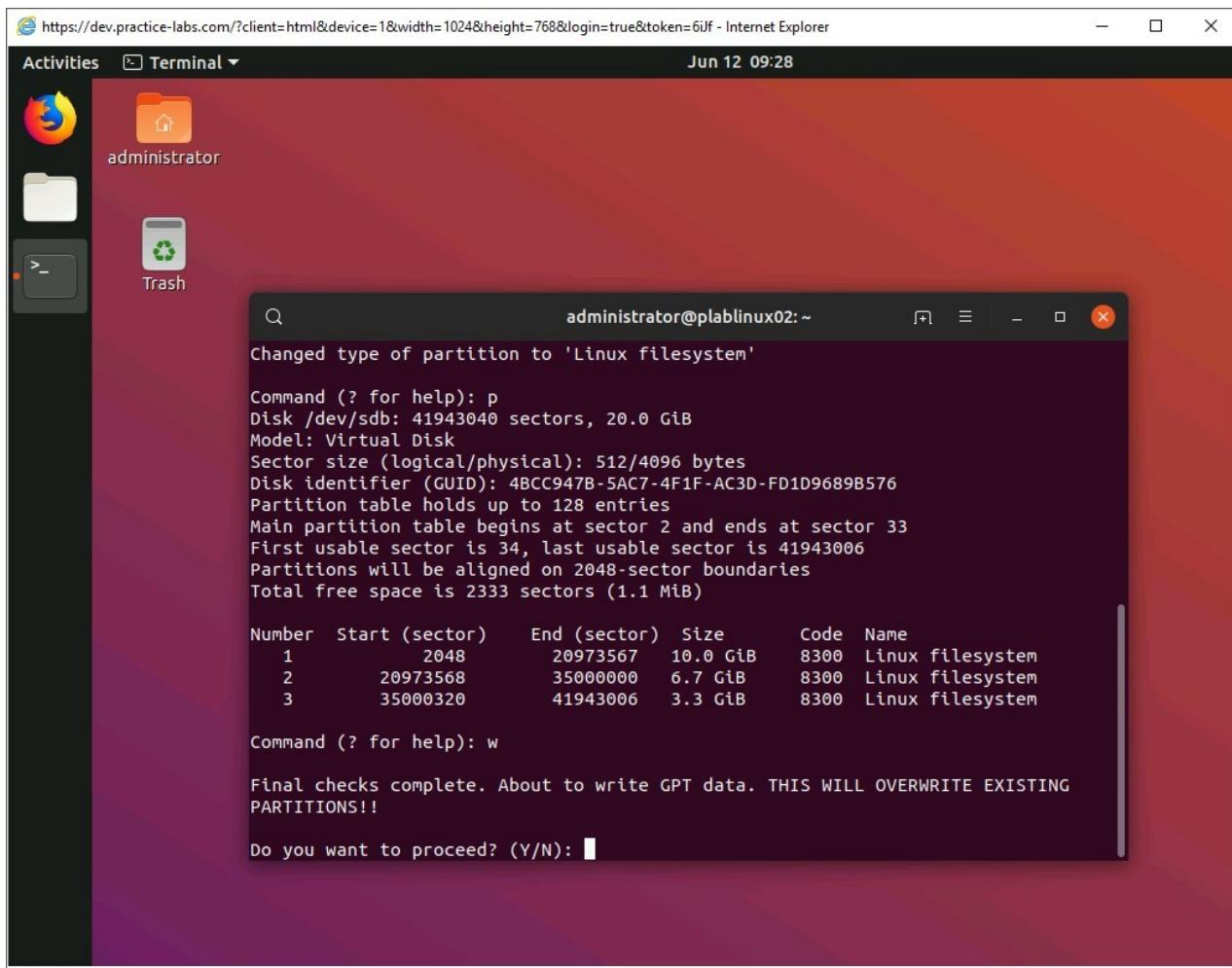


Figure 1.25 Screenshot of PLABLINUX02: Writing the partition.

Step 8

To confirm your choice, type the following:

Y

Press **Enter**.

Note: A warning is shown that the kernel is still using the old partition table and that the new table will be used at the next reboot. You can complete the reboot or continue to the next step.

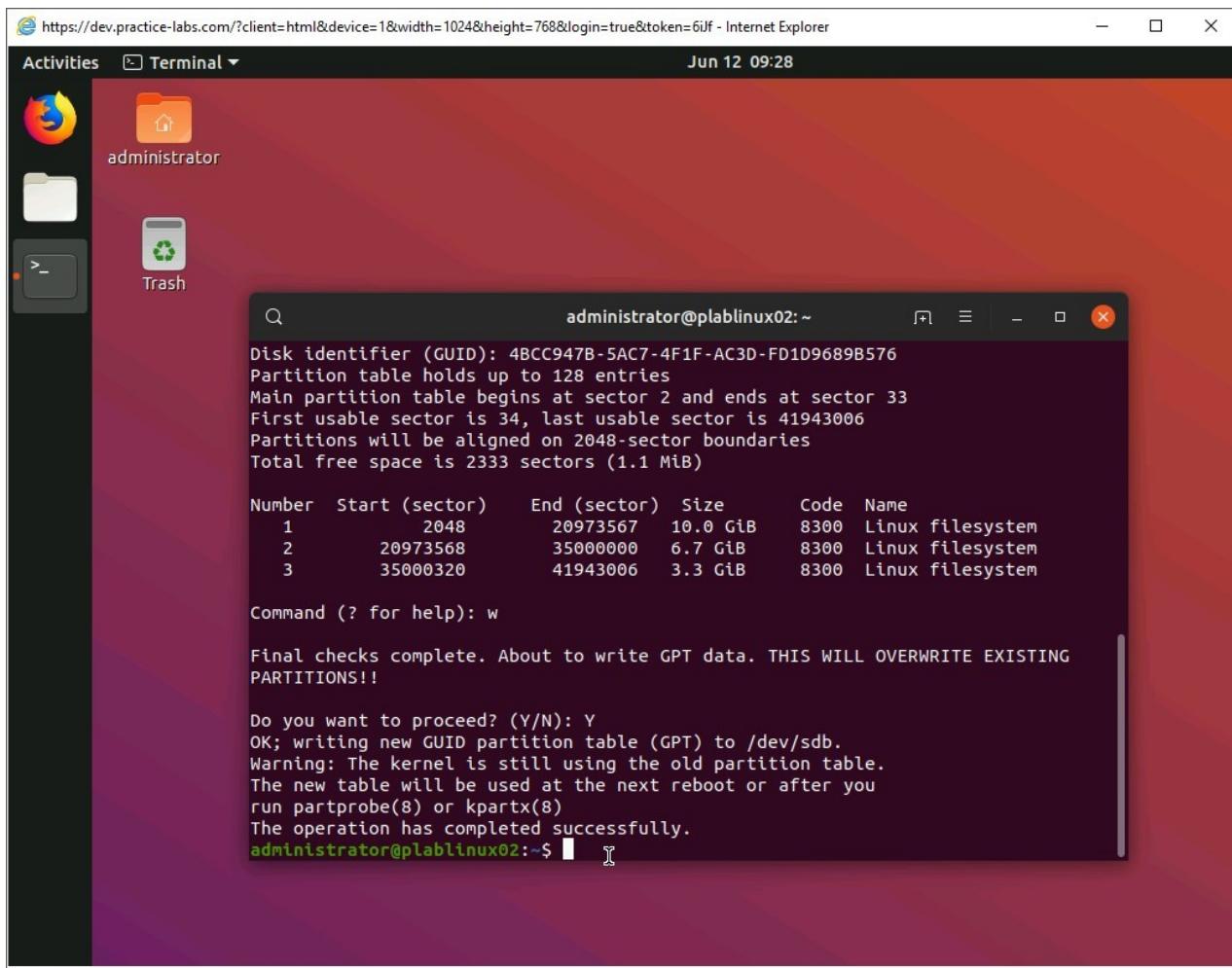


Figure 1.26 Screenshot of PLABLINUX02: Confirming the writing of the partition information.

Step 9

Clear the screen by entering the following command:

```
clear
```

To verify that the new partition table is now created and there is a new partition on **/dev/sdb**, type the following command:

```
sudo fdisk -l
```

Press **Enter**.

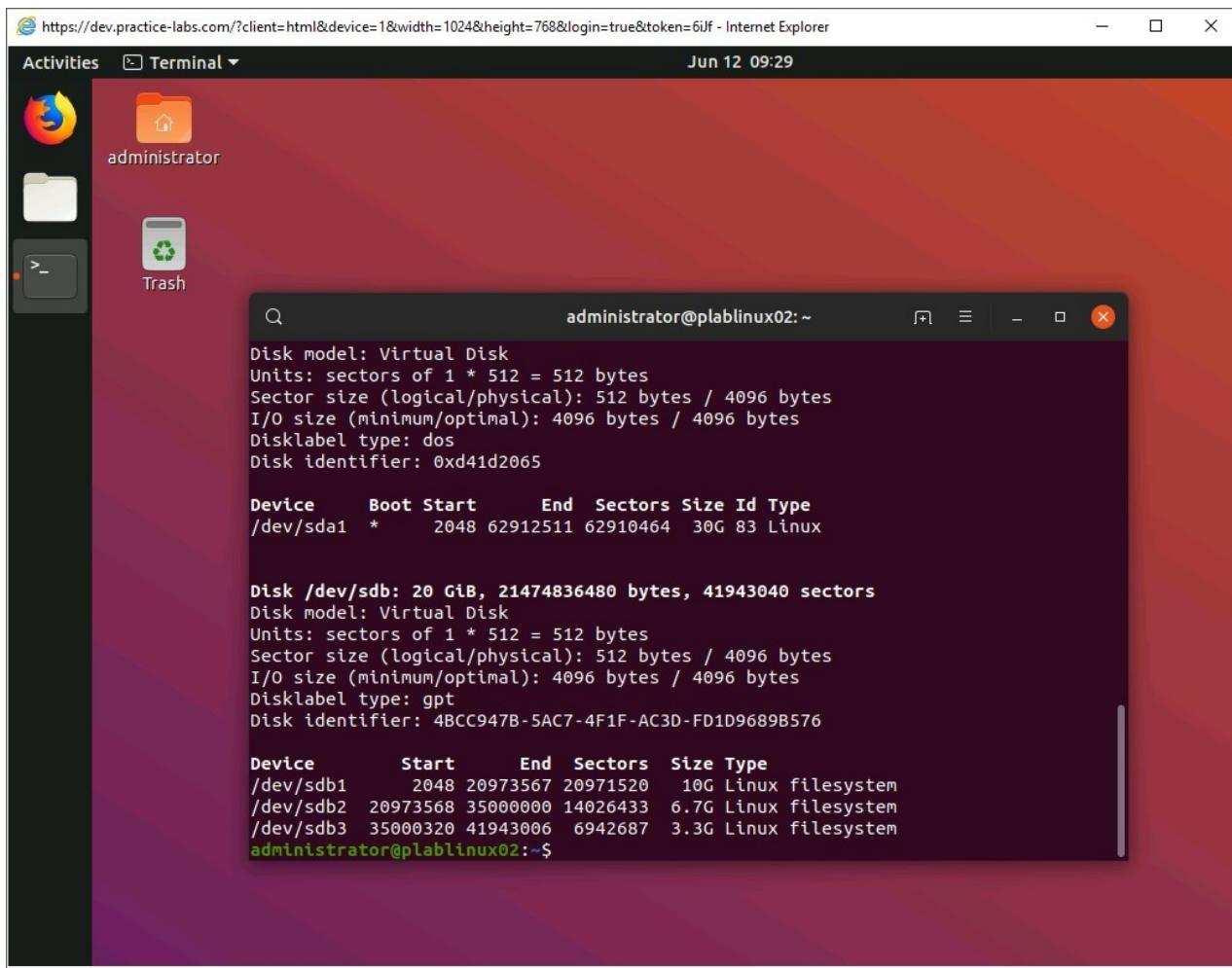


Figure 1.27 Screenshot of PLABLINUX02: Verifying the new partition table.

Step 10

Clear the screen by entering the following command:

```
clear
```

Using the mkswap command, you can also create the swap space on a partition. However, before you proceed with creating the swap space, you need to unmount the partition. Type the following command:

```
sudo umount /dev/sdb2
```

Press **Enter**.

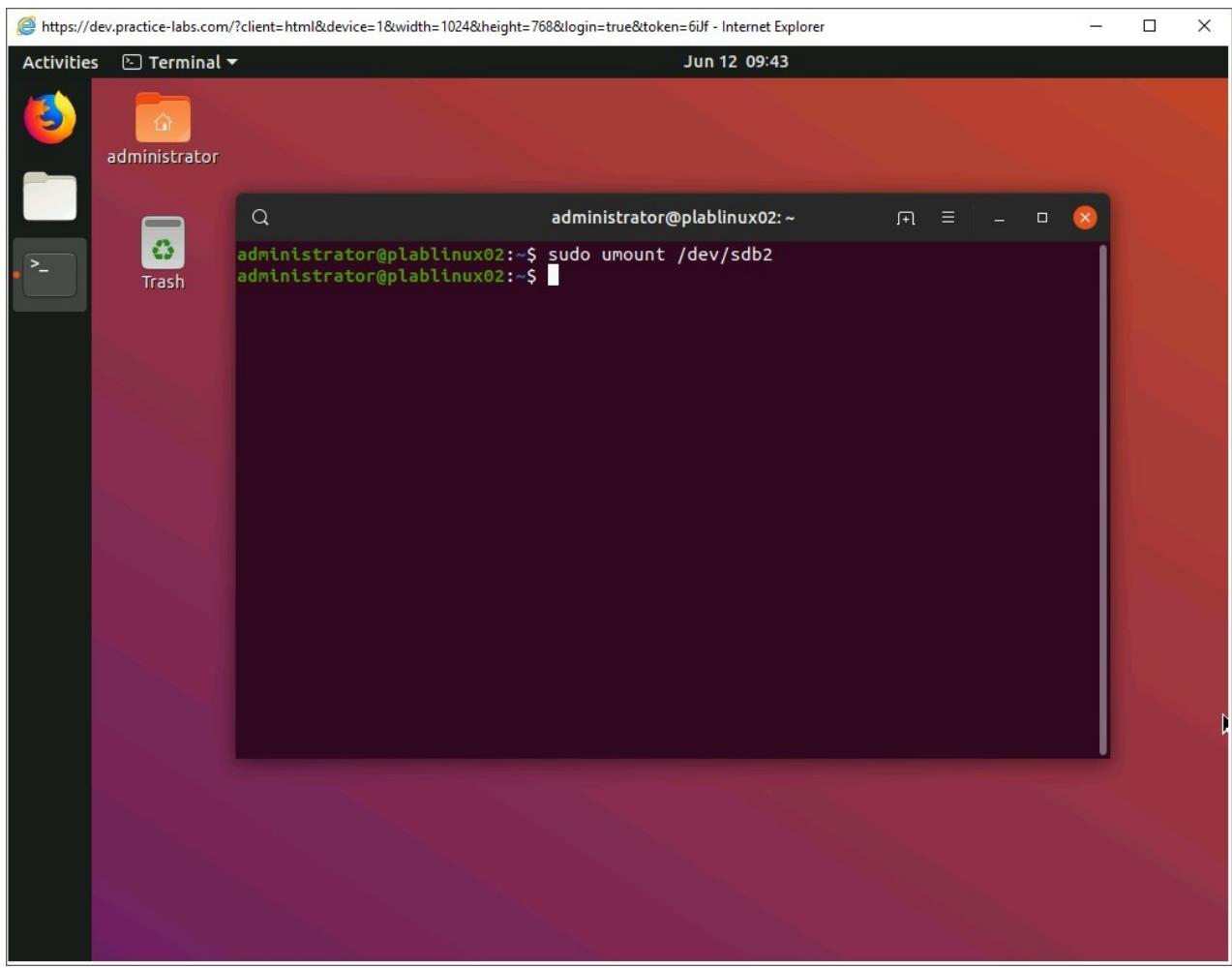


Figure 1.28 Screenshot of PLABLINUX02: Unmounting the partition.

Step 11

To create swap space on the **sdb2** partition, type the following command:

```
sudo mkswap /dev/sdb2
```

Press **Enter**.

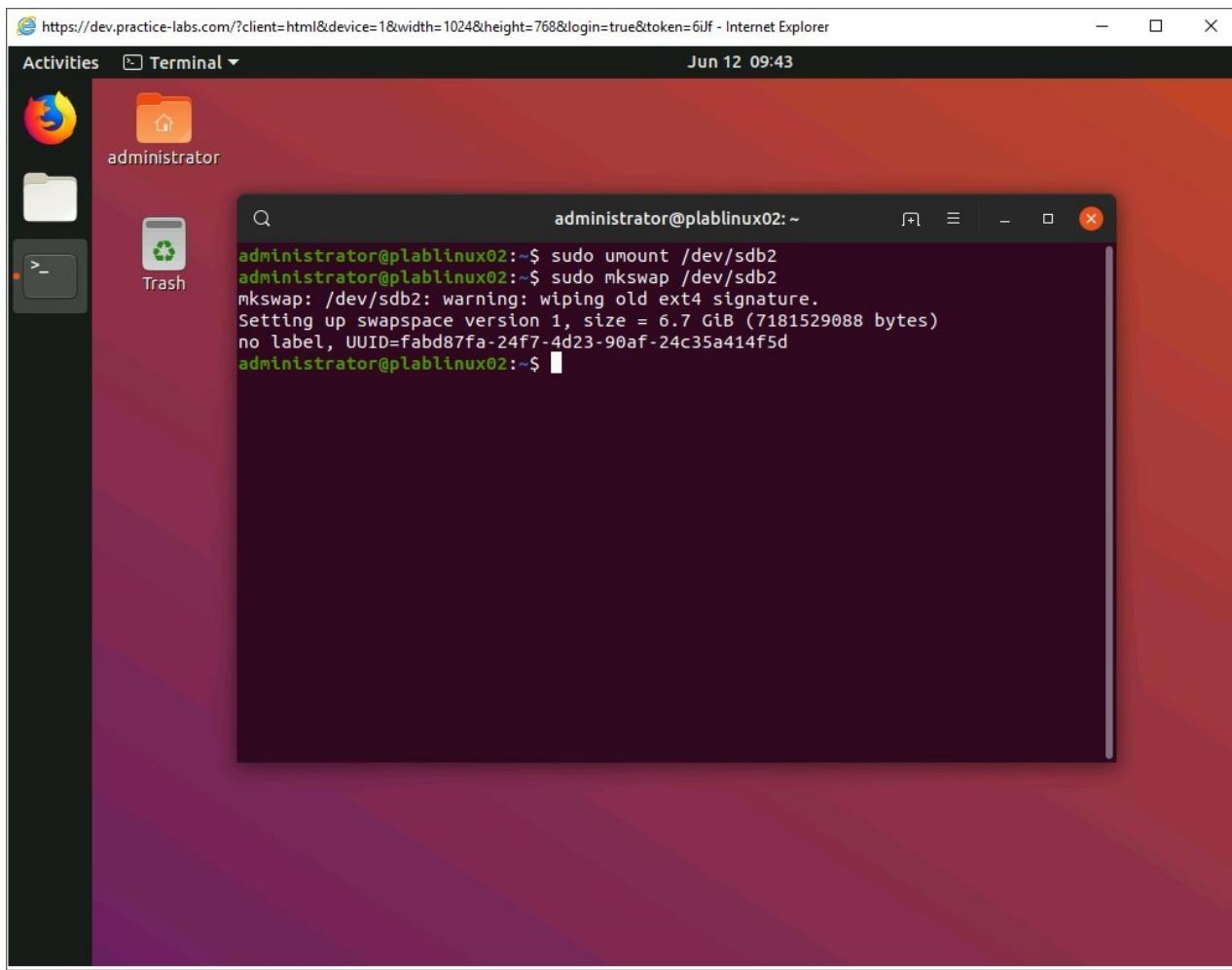


Figure 1.29 Screenshot of PLABLINUX02: Creating the swap space on the /dev/sdb2 partition.

Task 3 - Create Various Filesystems

You can create different types of filesystems, such as ext2, ext3, and ext4, with the **mkfs** command. In this task, you will create an ext3 filesystem on the sdb1 partition created in the earlier task.

To create a filesystem, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

In the previous task, you noticed that **/dev/sdb1** had been created.

To create a filesystem on this partition, type the following command:

```
sudo mkfs -t ext3 /dev/sdb2
```

Press **Enter**. Note that **ext3** is a type of filesystem.

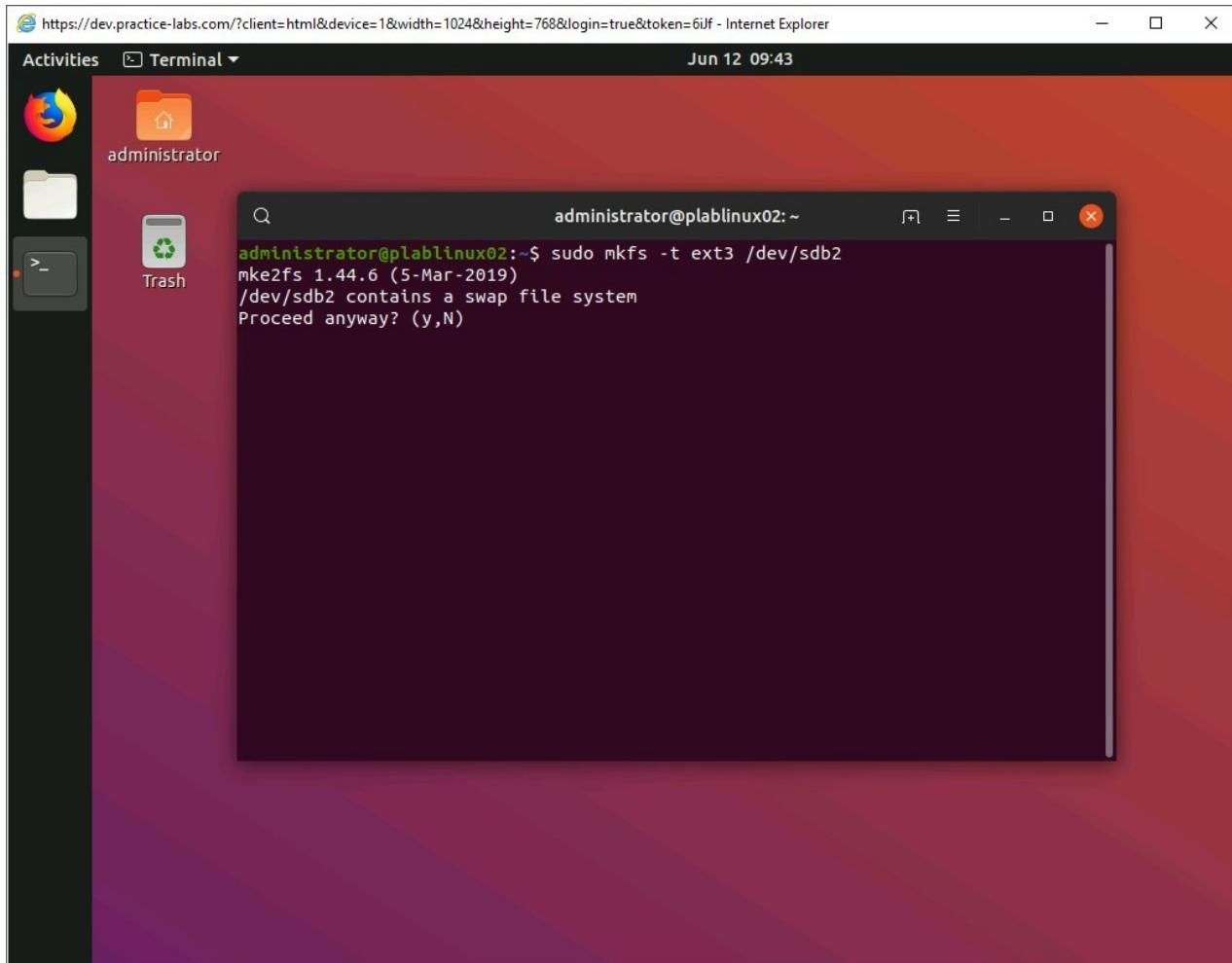


Figure 1.30 Screenshot of PLABLINUX02: Creating a filesystem on this partition.

Step 2

When prompted for confirmation, type the following:

```
y
```

Press **Enter**.

Note: You can similarly create the **ext2** and **ext4** type of filesystems.

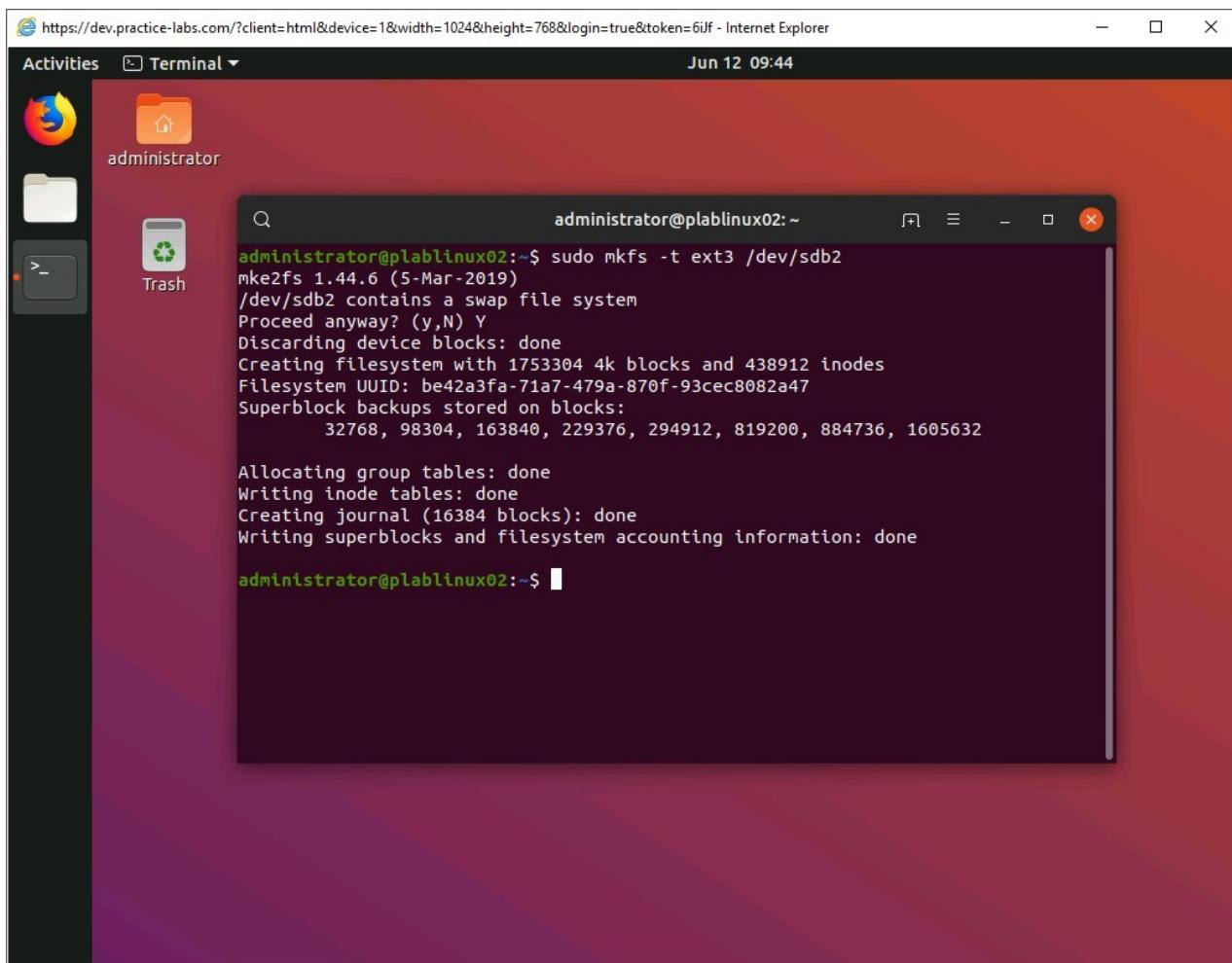


Figure 1.31 Screenshot of PLABLINUX02: Confirming the partition type.

Step 3

To verify the type of partition being used, type the following command:

```
sudo lsblk -f
```

Press **Enter**.

Notice that sdb2 is of the ext3 file system.

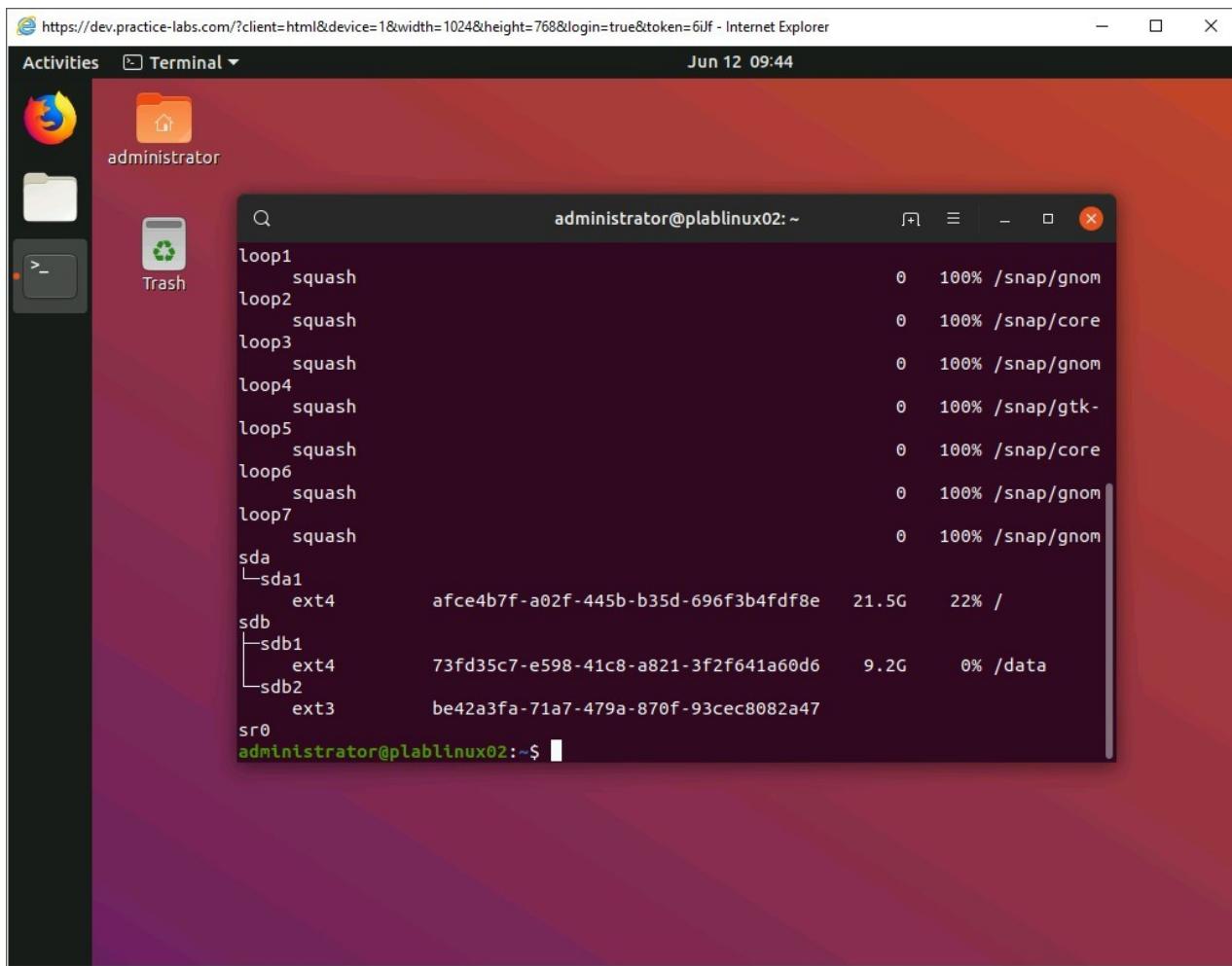


Figure 1.32 Screenshot of PLABLINUX02: Verifying the partition type being used.

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

Review

Well done, you have completed the **Create Partitions and Filesystems** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Create Partitions and Filesystems

You should now be able to:

- Manage MBR partition tables
- Manage GPT partition tables
- Create various filesystems

Feedback

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