

Modify Process Execution Priorities

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Introduction

Welcome to the **Modify Process Execution Priorities** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Modification
Execution
Priorities

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Modify Process Execution Priorities

After completing this lab, you will be able to:

- Know the priority of a process
- Manage the priority of a new process
- Change the priority of a running process

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 103.5 Create, monitor and kill processes
- **CompTIA:** 4.2 Given a scenario, analyse system processes in order to optimize performance.

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 - Modify Process Execution Priorities

In this exercise, you will understand how to modify process execution priorities.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Know the priority of a process
- Manage the priority of a new process
- Change the priority of a running process

Your Devices

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

- **PLABLINUX02** (Ubuntu Server)



Task 1 - Know the Priority of a Process

Priority of a process is about managing the processor time. When you assign a priority to a process, it will work with the processor depending on its priority. By default, the priority is set to zero. The range of priorities is -20 to 19. Lower the value, higher the priority a process is assigned.

In this task, you will list the default priority assigned to a process. You will also identify the priority assigned to a specific user.

To know the priority of a process, perform the following steps:

Step 1

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

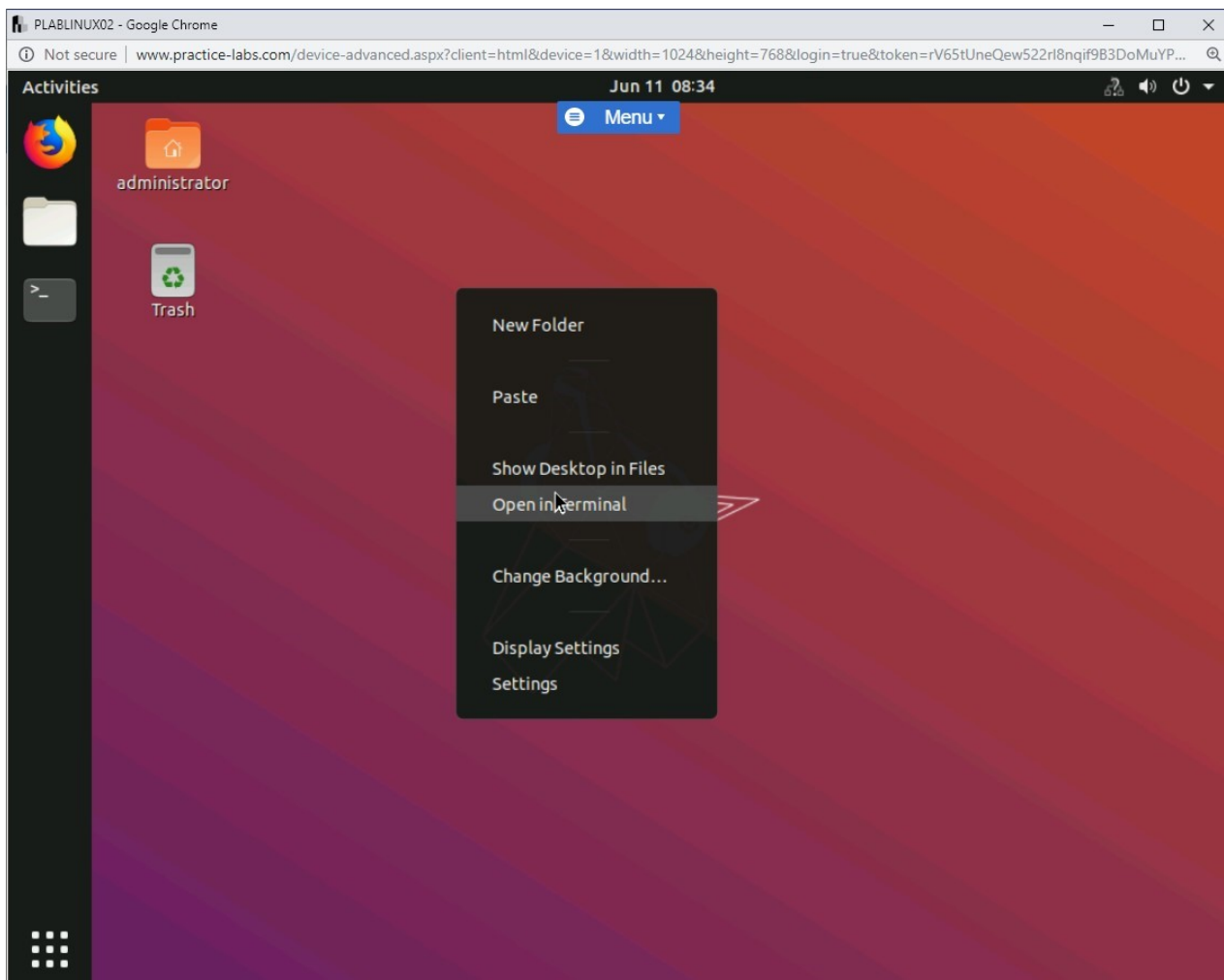


Figure 1.1 Screenshot of PLABLINUX02: Selecting the Open Terminal option from the context menu.

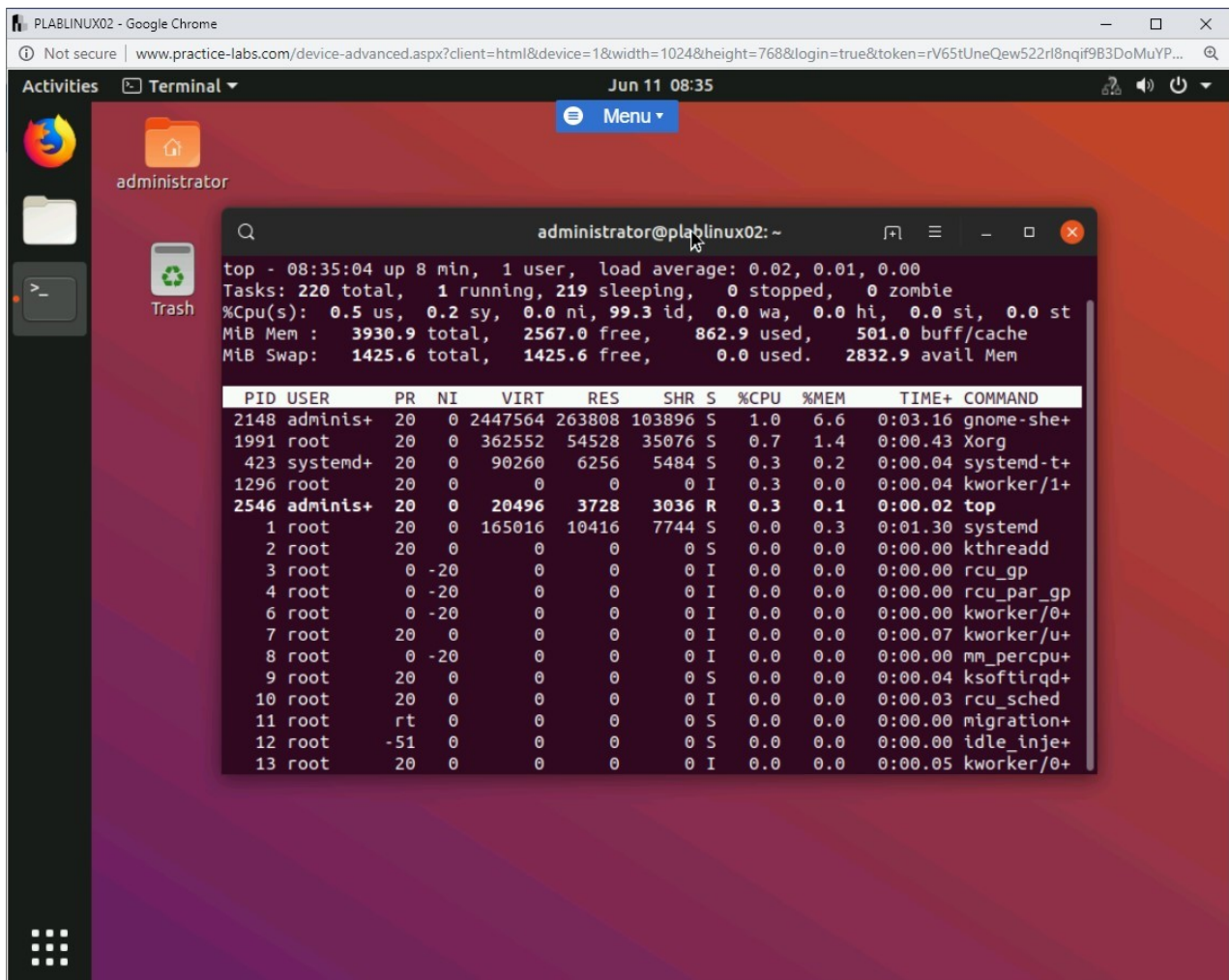
Step 2

Let's first list all active processes that are running on the system. Type the following command:

```
top
```

Press **Enter**.

Note that the **NI** field displays the priority of a process that is running.



```
top - 08:35:04 up 8 min, 1 user, load average: 0.02, 0.01, 0.00
Tasks: 220 total, 1 running, 219 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.5 us, 0.2 sy, 0.0 ni, 99.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 3930.9 total, 2567.0 free, 862.9 used, 501.0 buff/cache
MiB Swap: 1425.6 total, 1425.6 free, 0.0 used, 2832.9 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 2148 adminis+  20   0 2447564 263808 103896 S   1.0   6.6   0:03.16 gnome-she+
 1991 root      20   0 362552 54528 35076 S   0.7   1.4   0:00.43 Xorg
   423 systemd+ 20   0 90260 6256 5484 S   0.3   0.2   0:00.04 systemd-t+
 1296 root      20   0    0    0    0 I   0.3   0.0   0:00.04 kworker/1+
 2546 adminis+ 20   0 20496 3728 3036 R   0.3   0.1   0:00.02 top
    1 root      20   0 165016 10416 7744 S   0.0   0.3   0:01.30 systemd
    2 root      20   0    0    0    0 S   0.0   0.0   0:00.00 kthreadd
    3 root      0 -20    0    0    0 I   0.0   0.0   0:00.00 rcu_gp
    4 root      0 -20    0    0    0 I   0.0   0.0   0:00.00 rcu_par_gp
    6 root      0 -20    0    0    0 I   0.0   0.0   0:00.00 kworker/0+
    7 root      20   0    0    0    0 I   0.0   0.0   0:00.07 kworker/u+
    8 root      0 -20    0    0    0 I   0.0   0.0   0:00.00 mm_percpu+
    9 root      20   0    0    0    0 S   0.0   0.0   0:00.04 ksoftirqd+
   10 root      20   0    0    0    0 I   0.0   0.0   0:00.03 rcu_sched
   11 root      rt    0    0    0    0 S   0.0   0.0   0:00.00 migration+
   12 root     -51   0    0    0    0 S   0.0   0.0   0:00.00 idle_inje+
   13 root      20   0    0    0    0 I   0.0   0.0   0:00.05 kworker/0+
```

Figure 1.2 Screenshot of PLABLINUX02: Listing all active processes that are running on the system.

Step 3

Press **q** to break the top command.

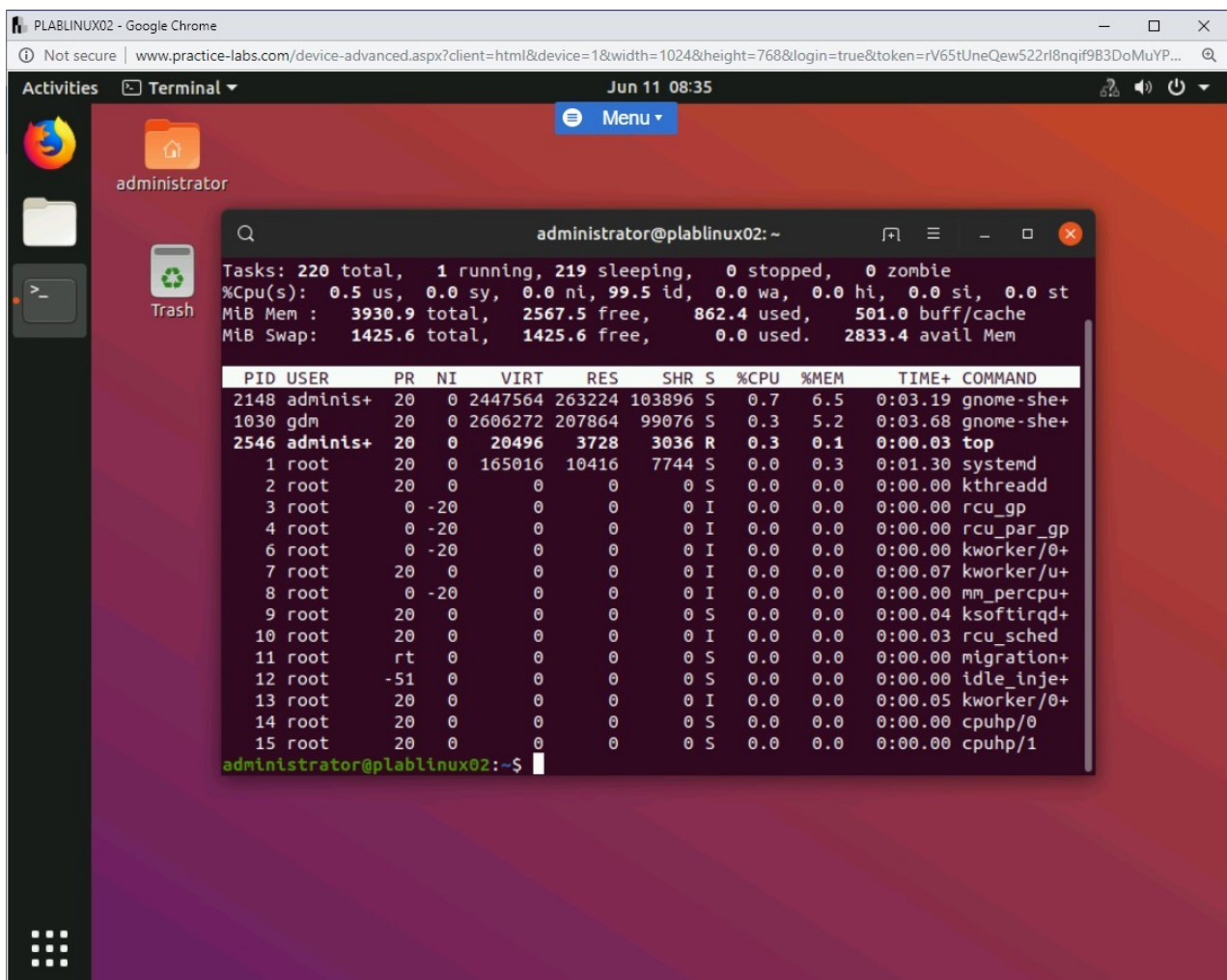


Figure 1.3 Screenshot of PLABLINUX02: Selecting the Open Terminal option from the context menu.

Step 4

Clear the screen by entering the following command:

```
clear
```

Note: You can also use the `ps` command to display the process information. By default, the `ps` command displays limited information.

To display detailed information, including the priority of a process, type the following command:

```
ps -l
```


Press **Enter**.

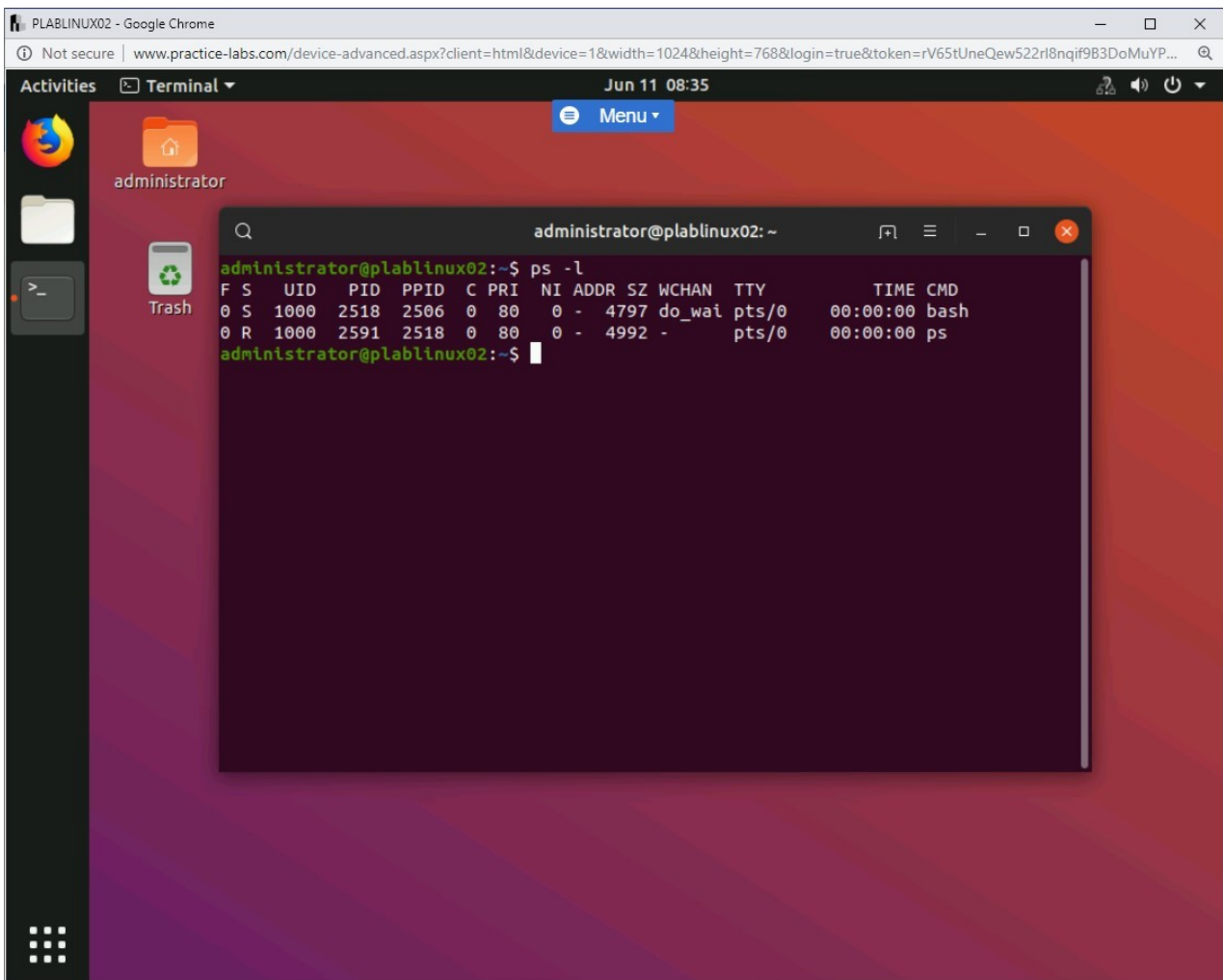


Figure 1.4 Screenshot of PLABLINUX02: Displaying the detailed process information.

Step 5

Clear the screen by entering the following command:

```
clear
```

You can also display the priority specified for a user. To display priorities for a specific user, type the following command:

```
ps -l -u administrator
```


Press **Enter**.

The output lists information about all the processes running under the **administrator** user.

*Note: UID, or the user ID, is **1000** for the **administrator** user. (UID 0 is for the root user)*

Task 2 - Manage the Priority of a New Process

Linux allows you to manipulate the priority of a process. Using this feature, you can start a program with a higher or lower priority than the default priority. You can also change the priority of a process while it is running. In this task, you will change the **bash** process with priority **5**, while the default priority of the process is **0**.

To manage the priority of a process, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

You can run a program with higher or lower priority. For example, for a program with a default priority 0, you can change the priority to either of the following:

- Up to -1 to -19 where -19 is the highest priority
- From 1 to +20 where +20 is the lowest priority

For this task, consider the **bash** process with the **PID 6293**, displayed in the list of processes running on the system. Notice that the priority of the process is **0**.

Note: In your environment, the process id for bash may be different.

To change the priority of the process, type the following command:

```
nice -n +5 bash
```

Press **Enter**.

The command changes the priority of the process to **5**.

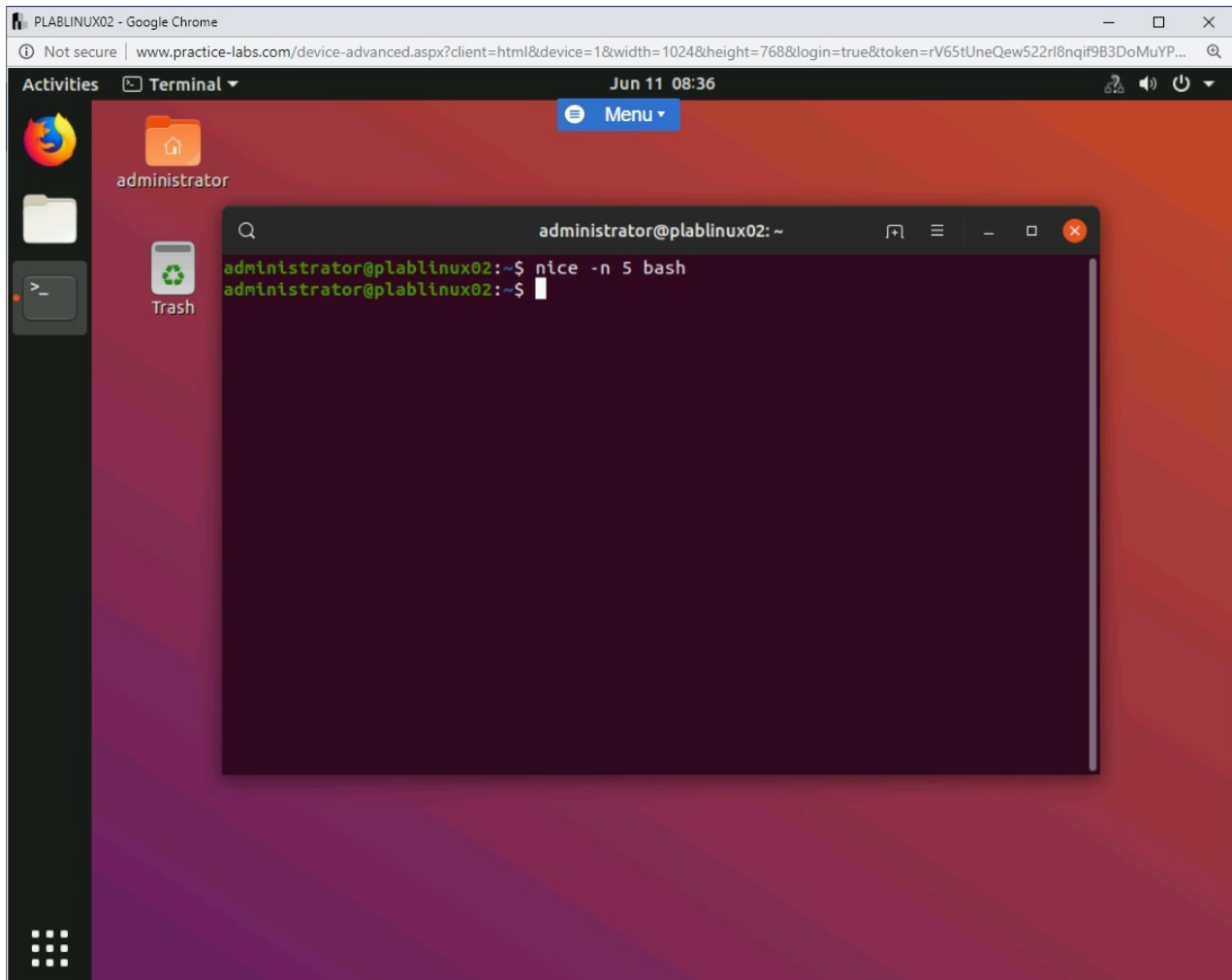


Figure 1.5 Screenshot of PLABLINUX02: Changing the priority of the process.

Step 2

You can also verify whether the program is running with the priority that you have set. To do this, type the following command:

```
ps -l -u administrator
```

Press **Enter**.

Note that the **bash** process number is now set with the priority of **5**.

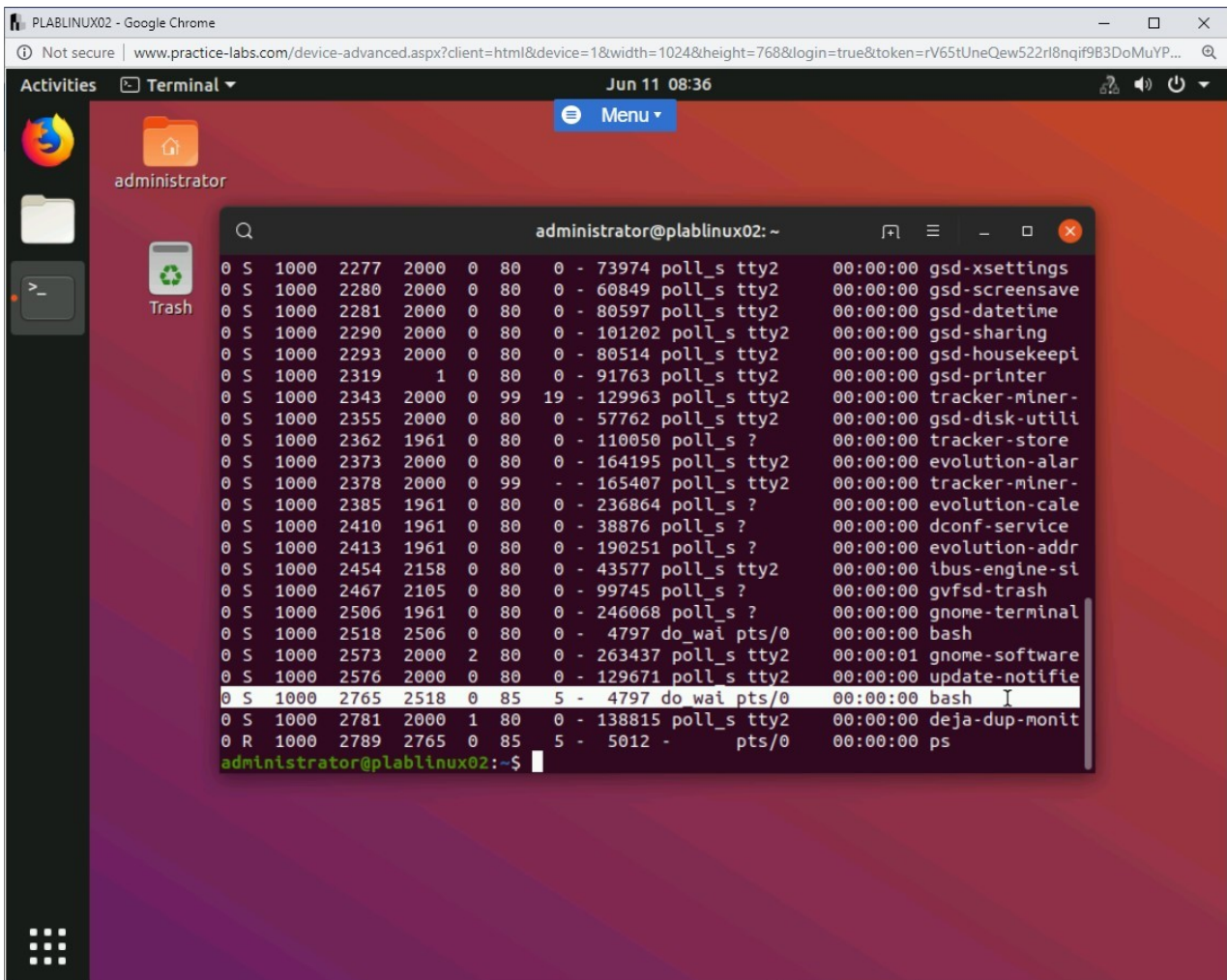


Figure 1.6 Screenshot of PLABLINUX02: Verifying whether the program is running with the priority.

Task 3 - Change the Priority of a Running Process

You can also change the priority when a process is running. You can change the priority using the **renice** command. In this task, you will change the priority of the **bash** process that is already running with a priority **5**.

To change the priority of an active process, perform the following steps:

Step 1

To change the priority of an active process, type the following command:

```
sudo renice +2 -p 2765
```

When prompted for a password, type the following password:

Passw0rd

Press **Enter**.

***Note:** For the lab demonstration purpose, process id **2765** is selected. You can choose any other process from the active process list. In your environment, the process id for bash will be different.*

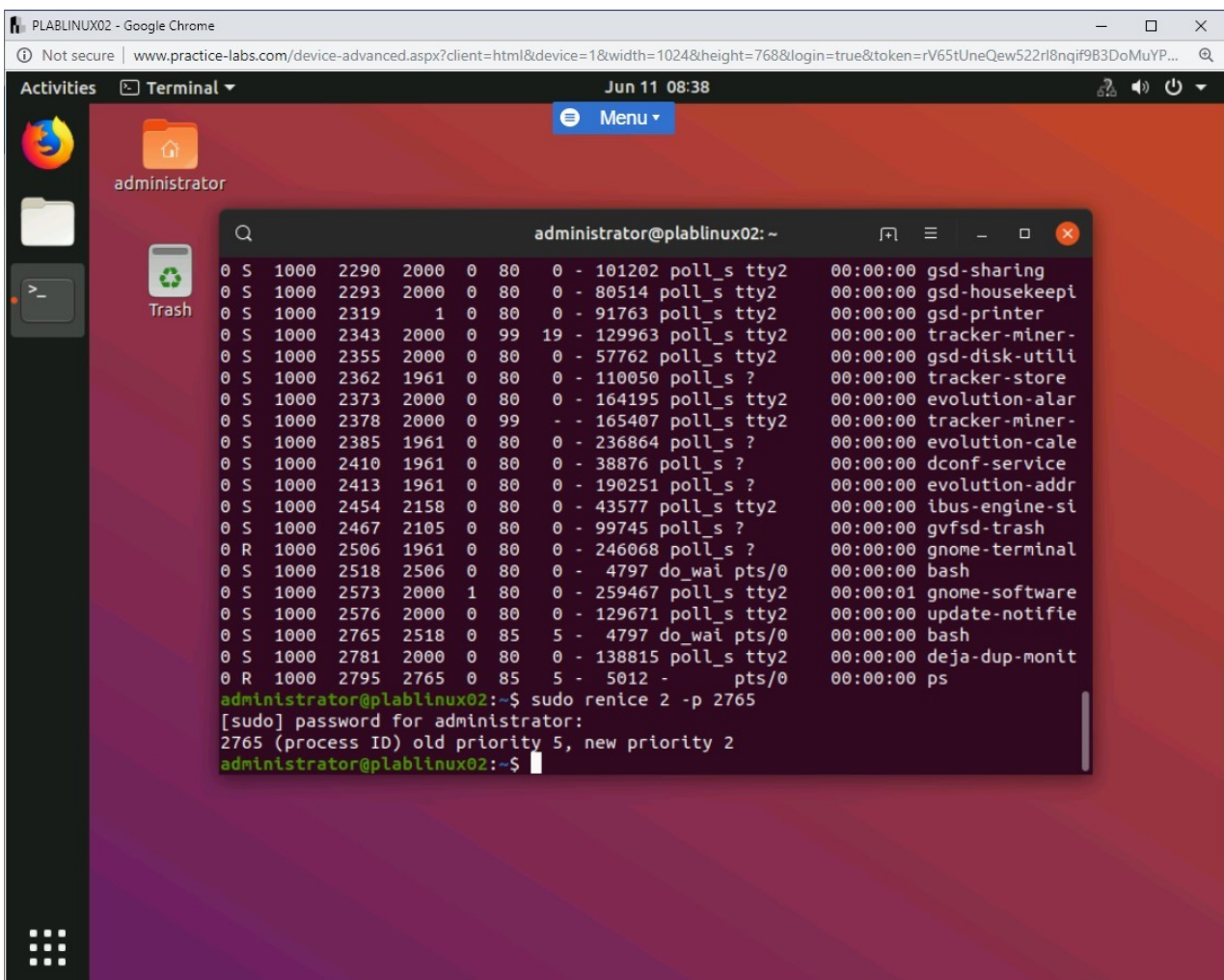


Figure 1.7 Screenshot of PLABLINUX02: Changing the priority of an active process.

Step 2

You are immediately notified that the process priority is now changed from **5**, which you had set when you started the process, to **2**. You can verify the changed process priority by typing the following command:


```
ps -l -u administrator
```

Press **Enter**.

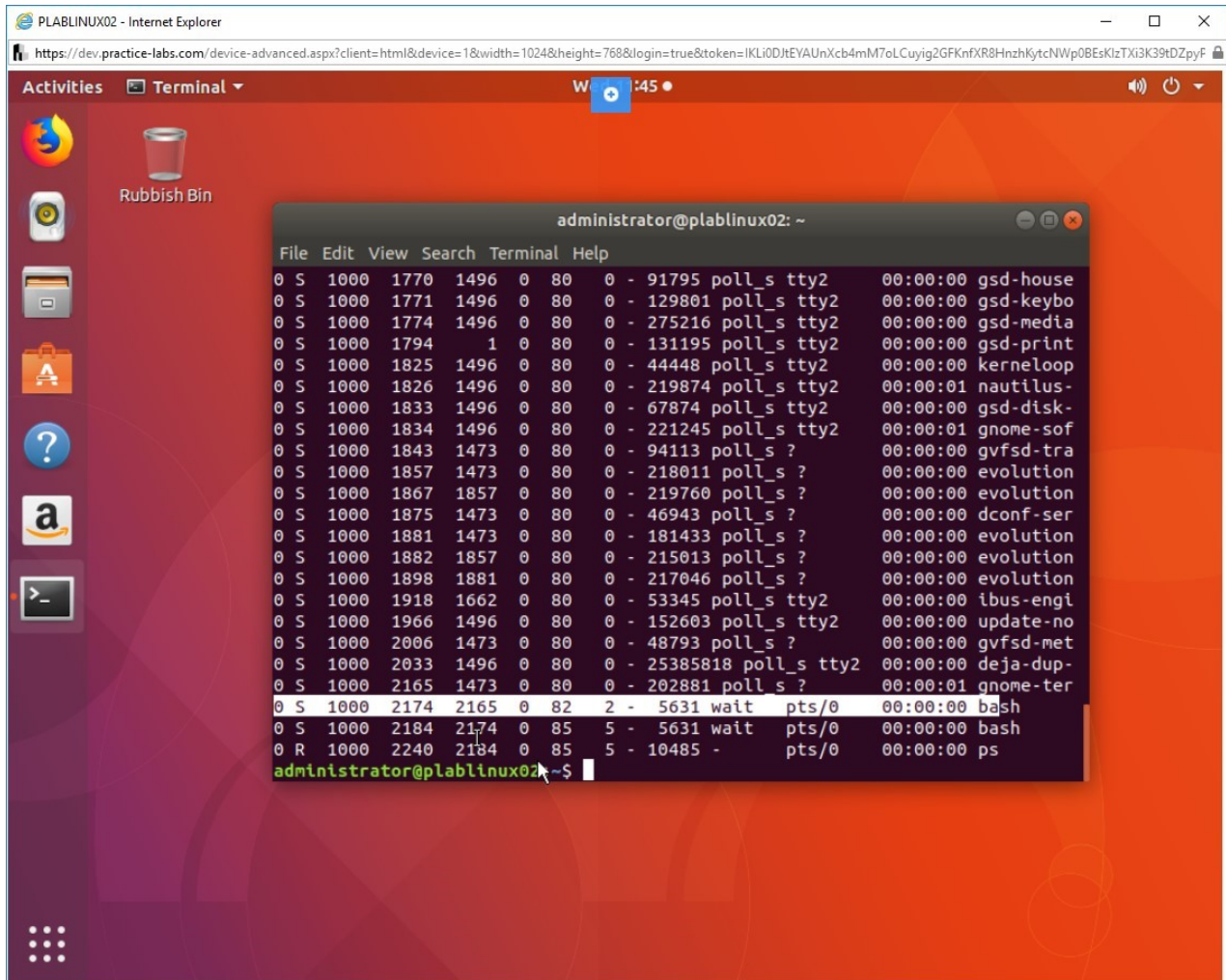


Figure 1.8 Screenshot of PLABLINUX02: Verifying the changed process id.

Step 3

Clear the screen by entering the following command:

```
clear
```

There may be situations where you want to change the priority of all processes for a user. Let's assume that for the **root** user, you want to change the priority of all processes.

To change the priority of all processes of the **root** user, enter the following command:

```
sudo renice +2 -u root
```

You are immediately notified that the process priority for all processes of **root** user is now changed to **2**.

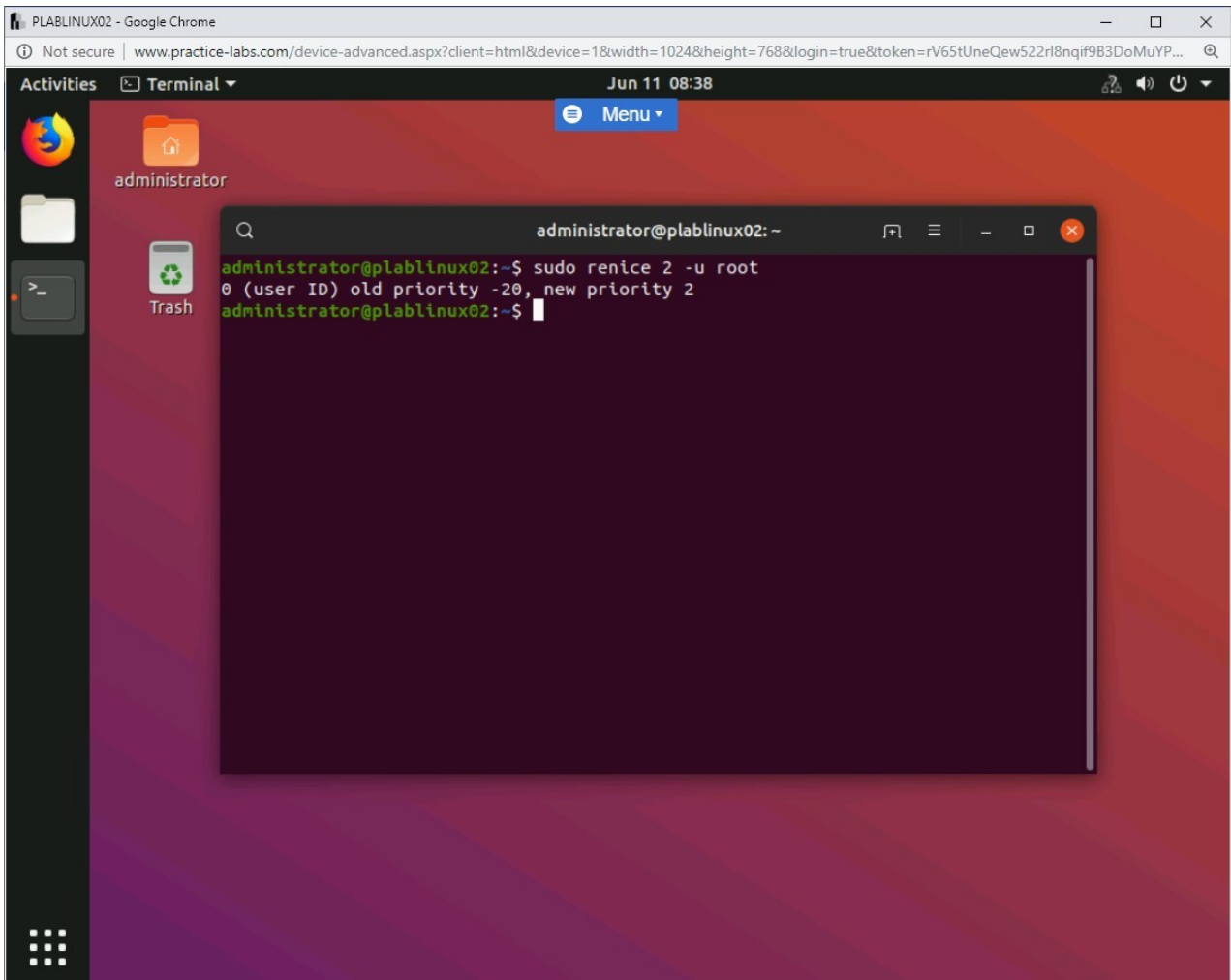


Figure 1.9 Screenshot of PLABLINUX02: Changing the priority of all processes of the root user.

Step 4

You can verify the changed process id by typing the following command:

```
ps -l -u root
```

Press **Enter**.

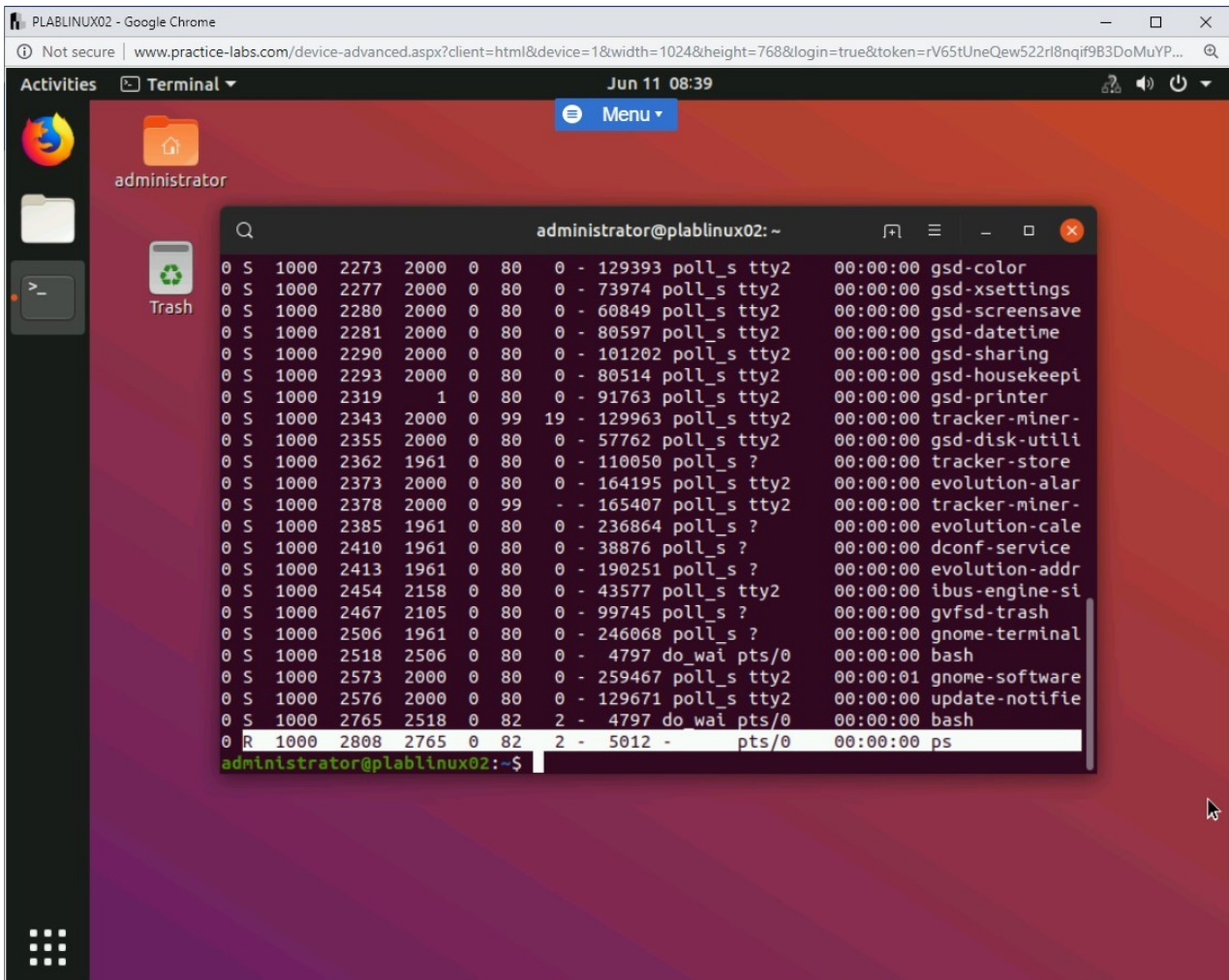


Figure 1.10 Screenshot of PLABLINUX02: Verifying the changed process id.

Step 5

Revert the priority of root processes back again with the following command:

```
sudo renice -20 -u root
```

Press **Enter**.

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

Review

Well done, you have completed the **Modify Process Execution Priorities** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Modify Process Execution Priorities

You should now be able to:

- Know the priority of a process
- Manage the priority of a new process
- Change the priority of a running process

Feedback

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