CompTIA Linux+

Configure Inheritance and Group Memberships

- **Introduction**
- **Lab Topology**
- **Exercise 1 - Configure Inheritance and Group Memberships**
- **Review**

Introduction

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

Inheritance
Group Membership
ACL

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Configure Inheritance and Group Memberships

After completing this lab, you will be able to:

- Use default ACL for permission inheritance
- Copy ACL
- Archive and restore ACL

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 104.5 Manage file permissions and ownership
- **CompTIA:** 4.4 Given a scenario, analyse and troubleshoot application and hardware issues.

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 **30 minutes** to complete this lab.

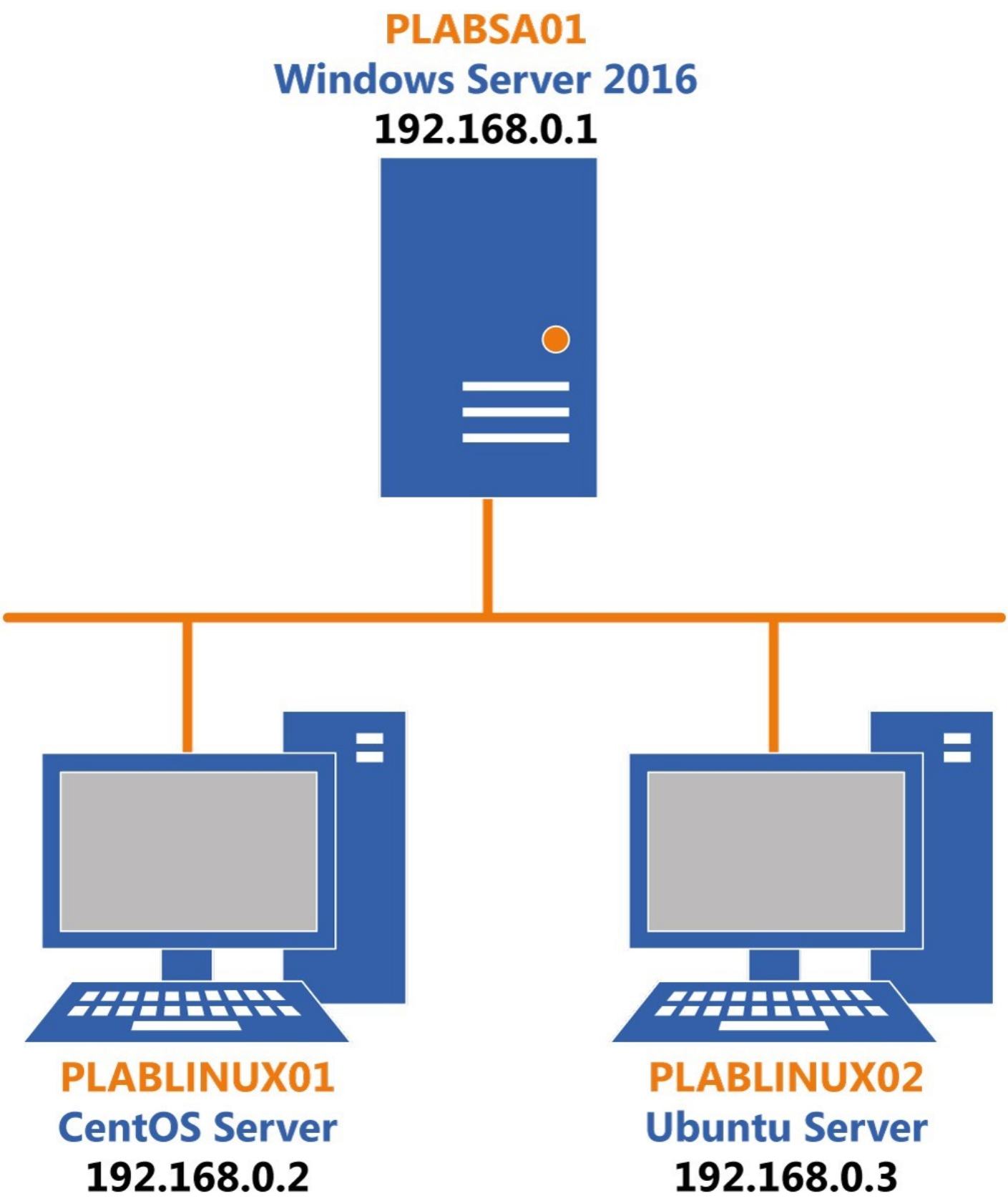
Help and Support

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 Inheritance and Group Memberships

Linux allows you to configure inheritance on the subdirectories and files. With the inheritance, the same set of permissions apply, and therefore, you do not have to assign permissions on each file individually.

In this exercise, you will learn to configure inheritance and group memberships.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Use default ACL for permission inheritance
- Copy ACL
- Archive and restore ACL

Your Devices

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

- **PLABLINUX01** (CentOS Server)

Task 1 - Use Default ACL for Permission Inheritance

The Default ACL is applied only to the directories. When you create a directory and apply Default ACL, the newly created files and subdirectories automatically inherit permissions from the parent directory.

In this task, you will learn to use Default ACL for permission inheritance. To use Default ACL for permission inheritance, perform the following steps:

Step 1

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

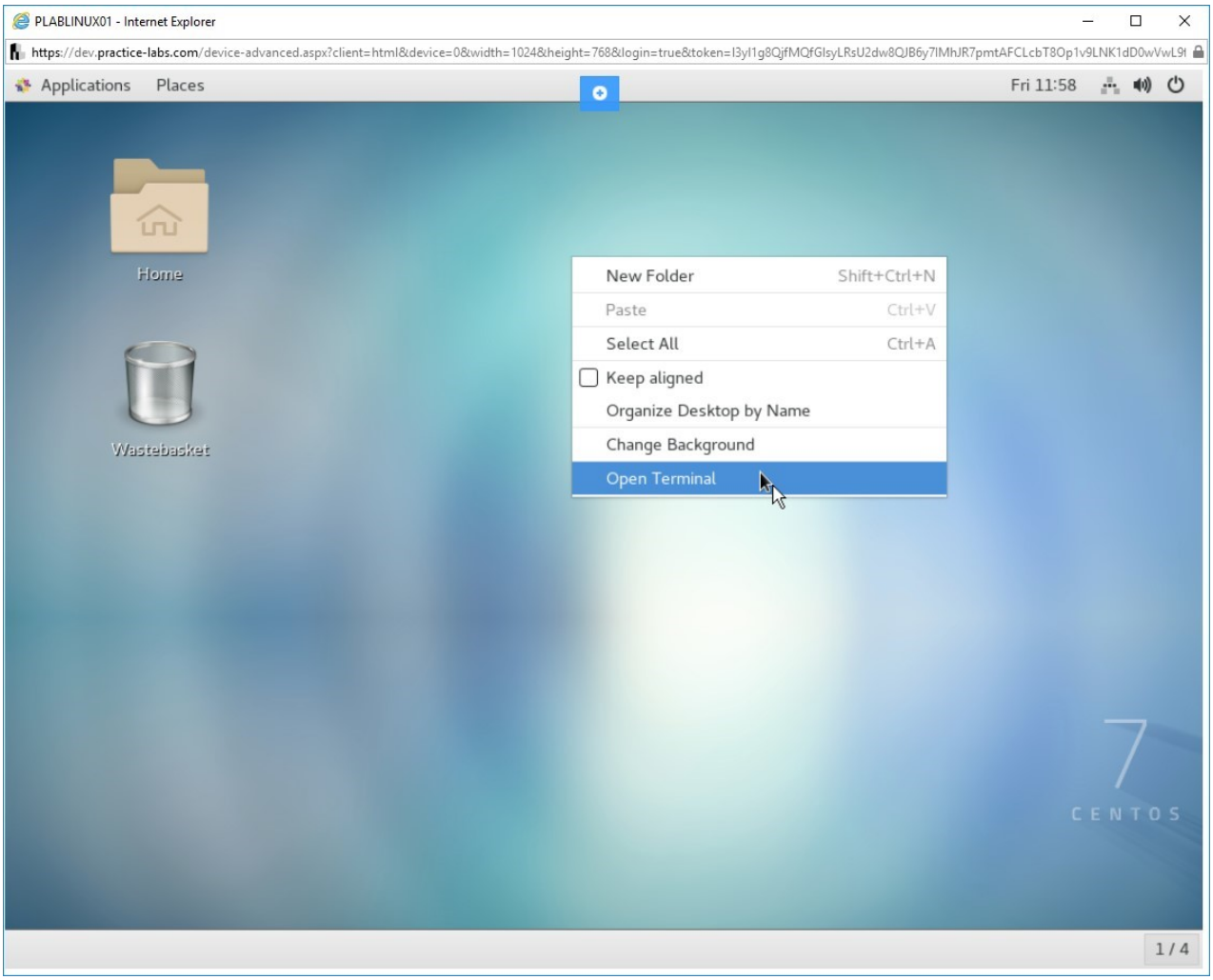


Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

The terminal prompt window is displayed. Type the following command:

```
su -
```

Press **Enter**.

At the **Password** prompt, type the following password:

```
Passw0rd
```

Press **Enter**.

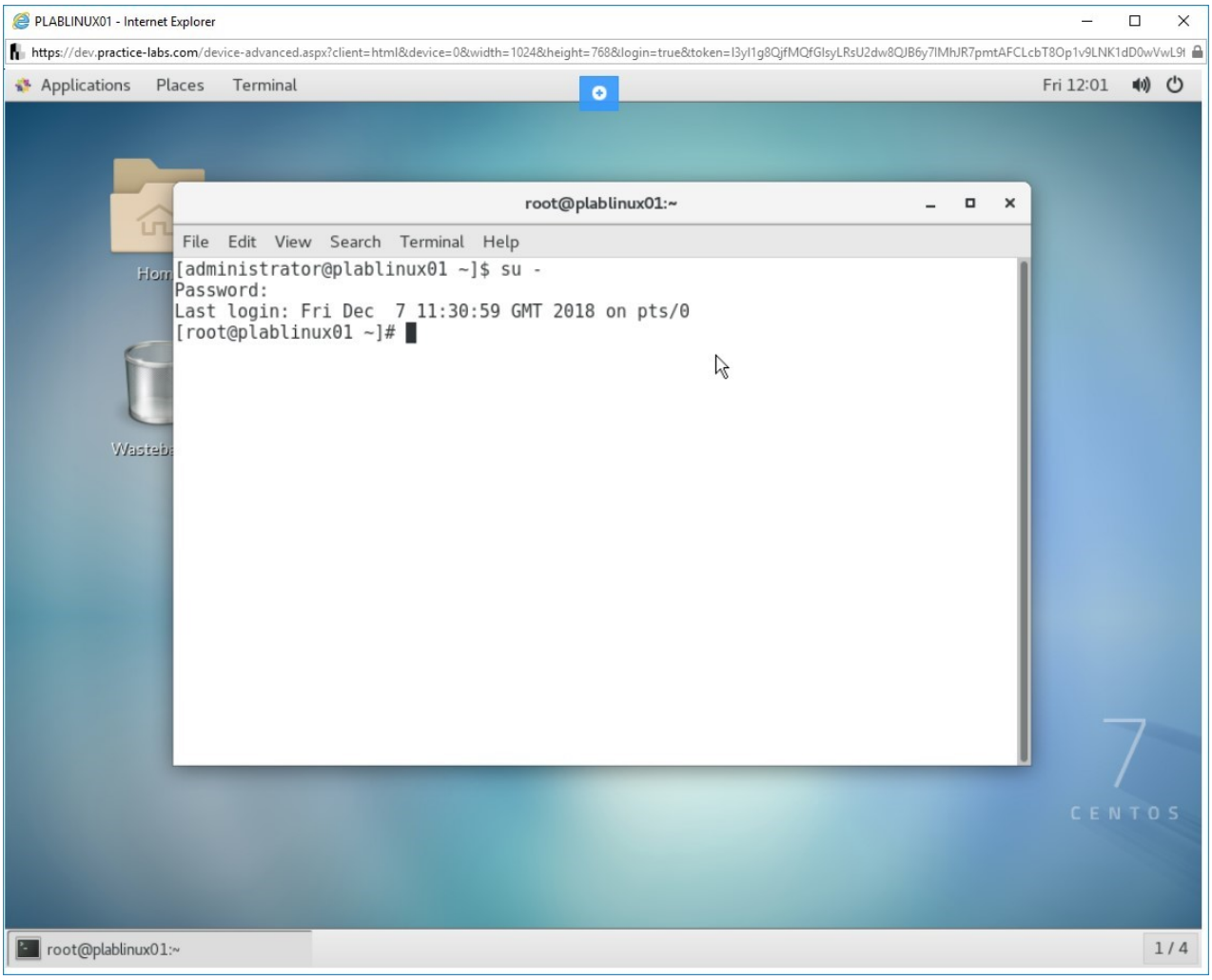


Figure 1.2 Screenshot of PLABLINUX01: Changing the account to the root account with the su command.

Step 3

Clear the screen by entering the following command:

```
clear
```

On the CentOS device, you need to create a new directory named **plab**. Type the following command:

```
mkdir plab
```

Press **Enter**.

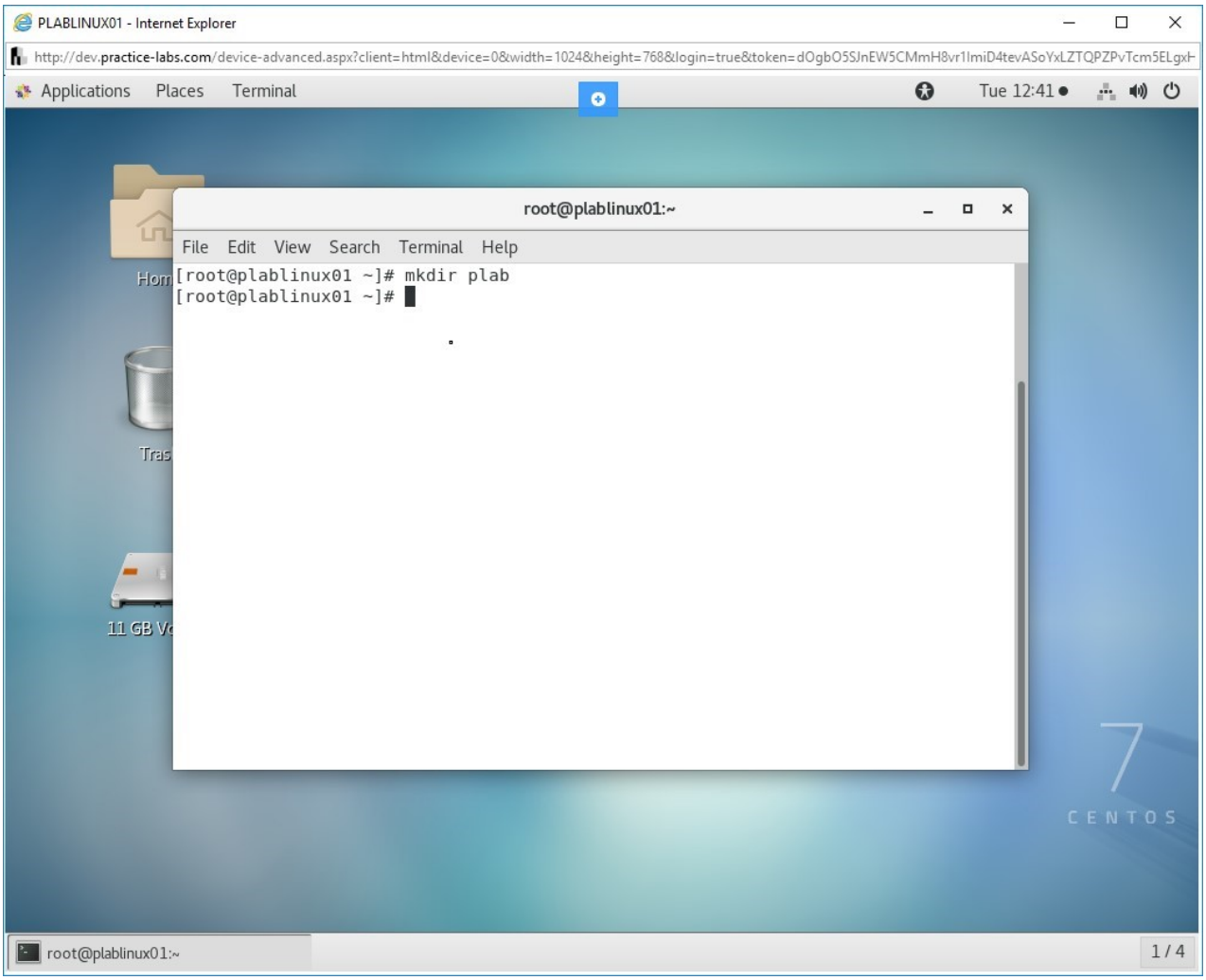


Figure 1.3 Screenshot of PLABLINUX01: Creating a directory named plab.

Step 4

Next, you need to create a user account named **matt**. Type the following command:

```
useradd matt
```

Press **Enter**.

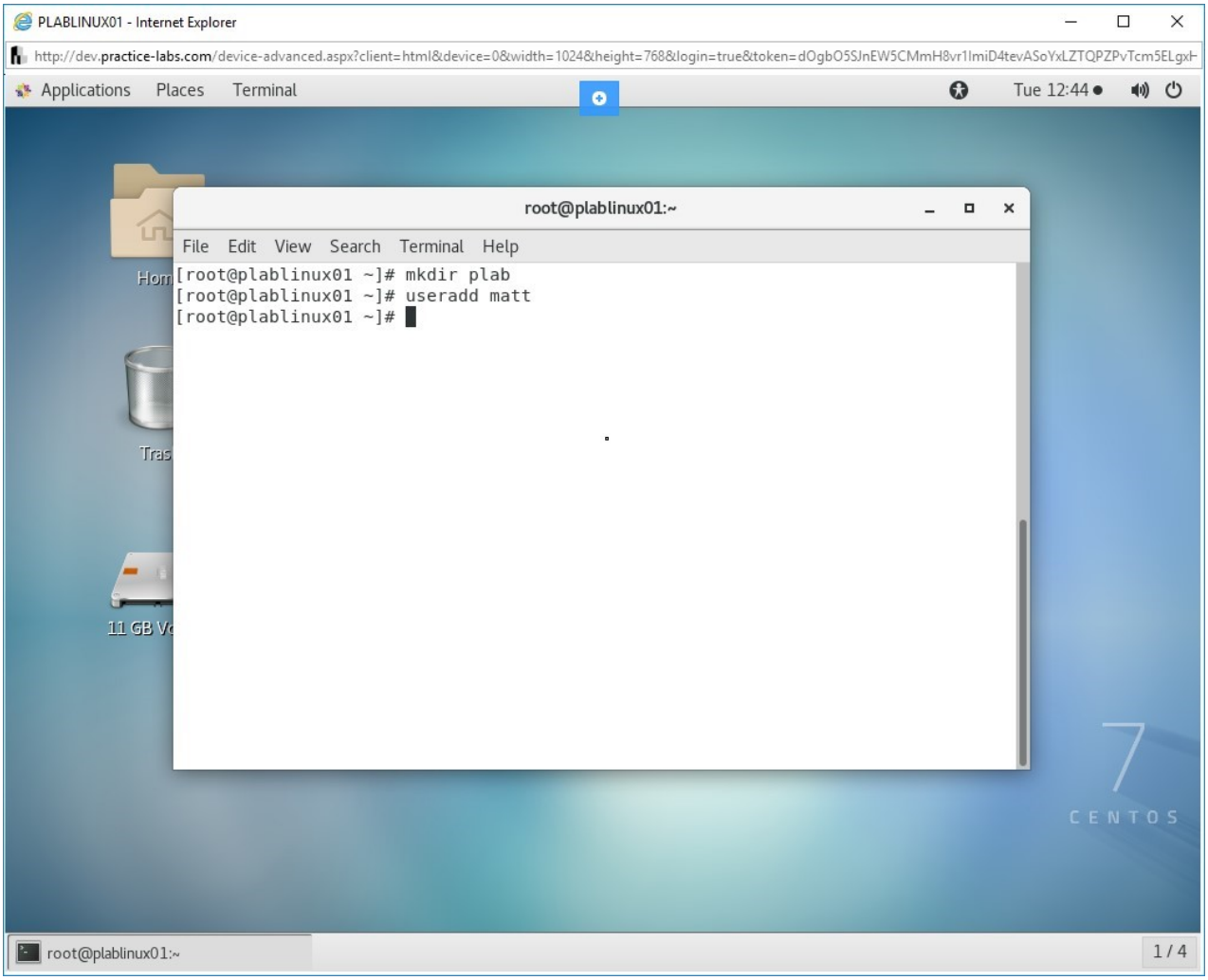


Figure 1.4 Screenshot of PLABLINUX01: Creating a new user named matt.

Step 5

Next, you need to set the password for the user account. Type the following command:

```
passwd matt
```

Press **Enter**.

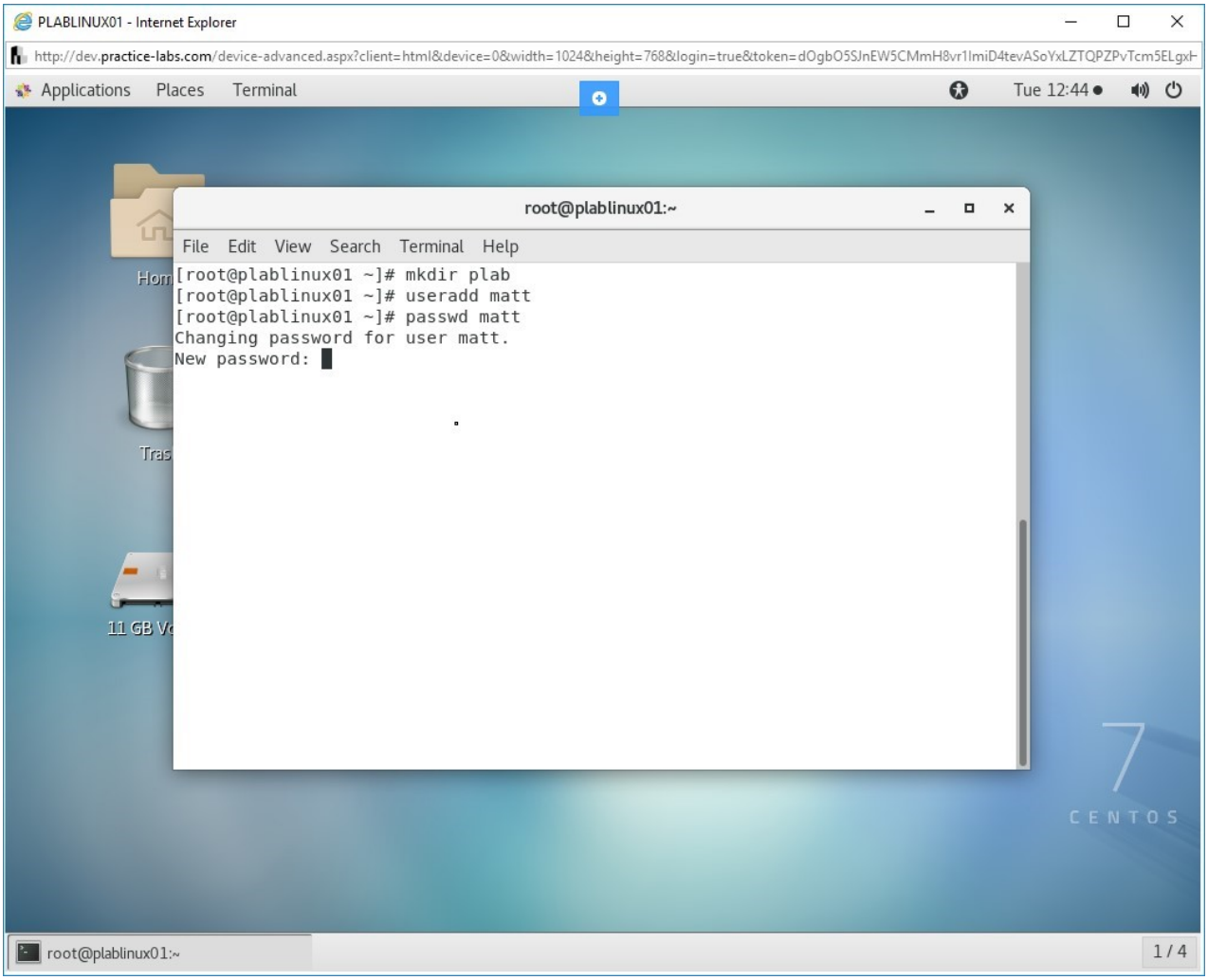


Figure 1.5 Screenshot of PLABLINUX01: Setting a password for the newly created user.

Step 6

When prompted, type the following password:

```
Passw0rd
```

Press **Enter**.

When prompted to confirm, type the same password and press **Enter**.

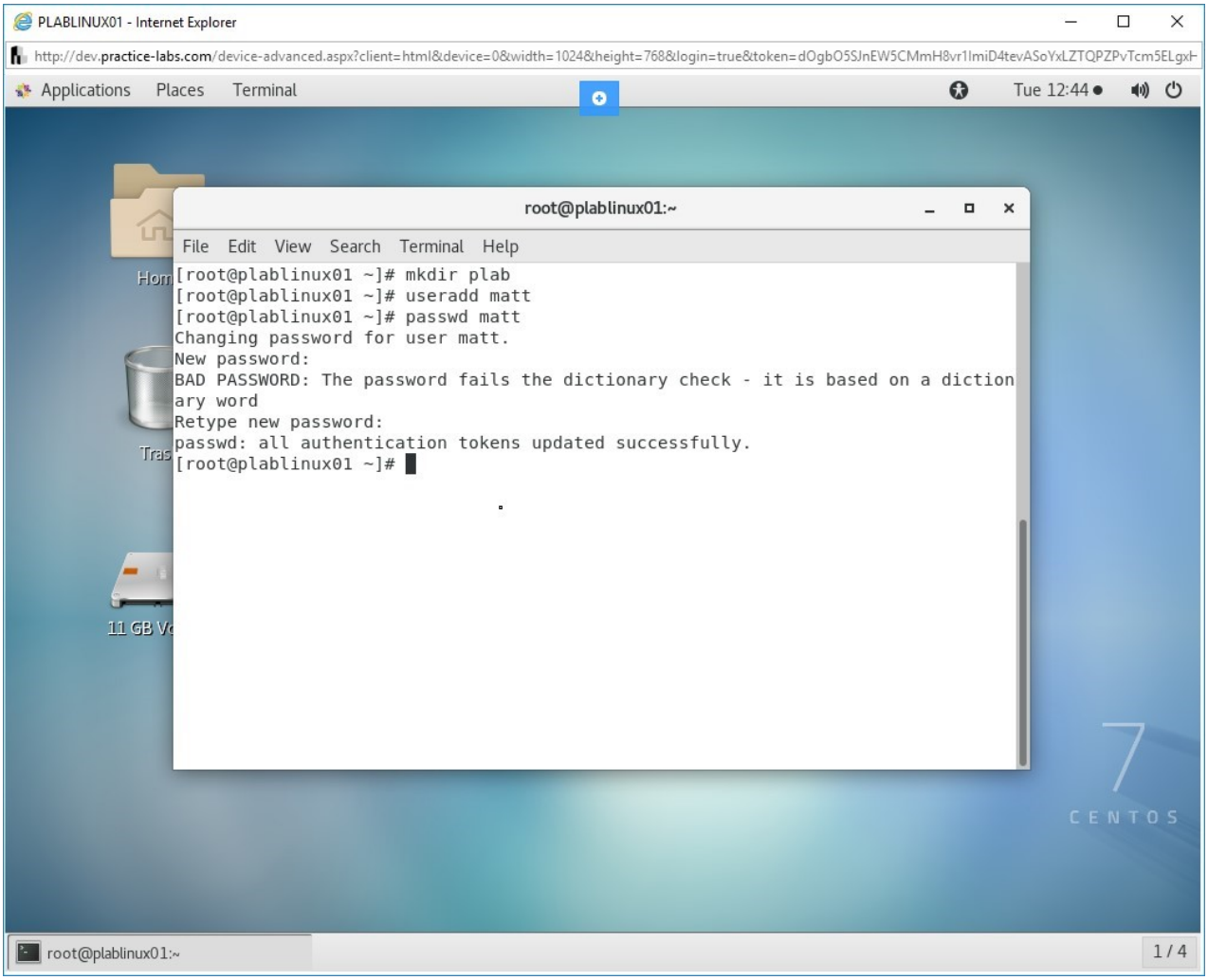


Figure 1.6 Screenshot of PLABLINUX01: Entering the password for the user, matt.

Step 7

Clear the screen by entering the following command:

```
clear
```

You will now need to define an access ACL. Type the following command:

```
setfacl --set u::rwx,g::r-x,o::- plab
```

Press **Enter**.

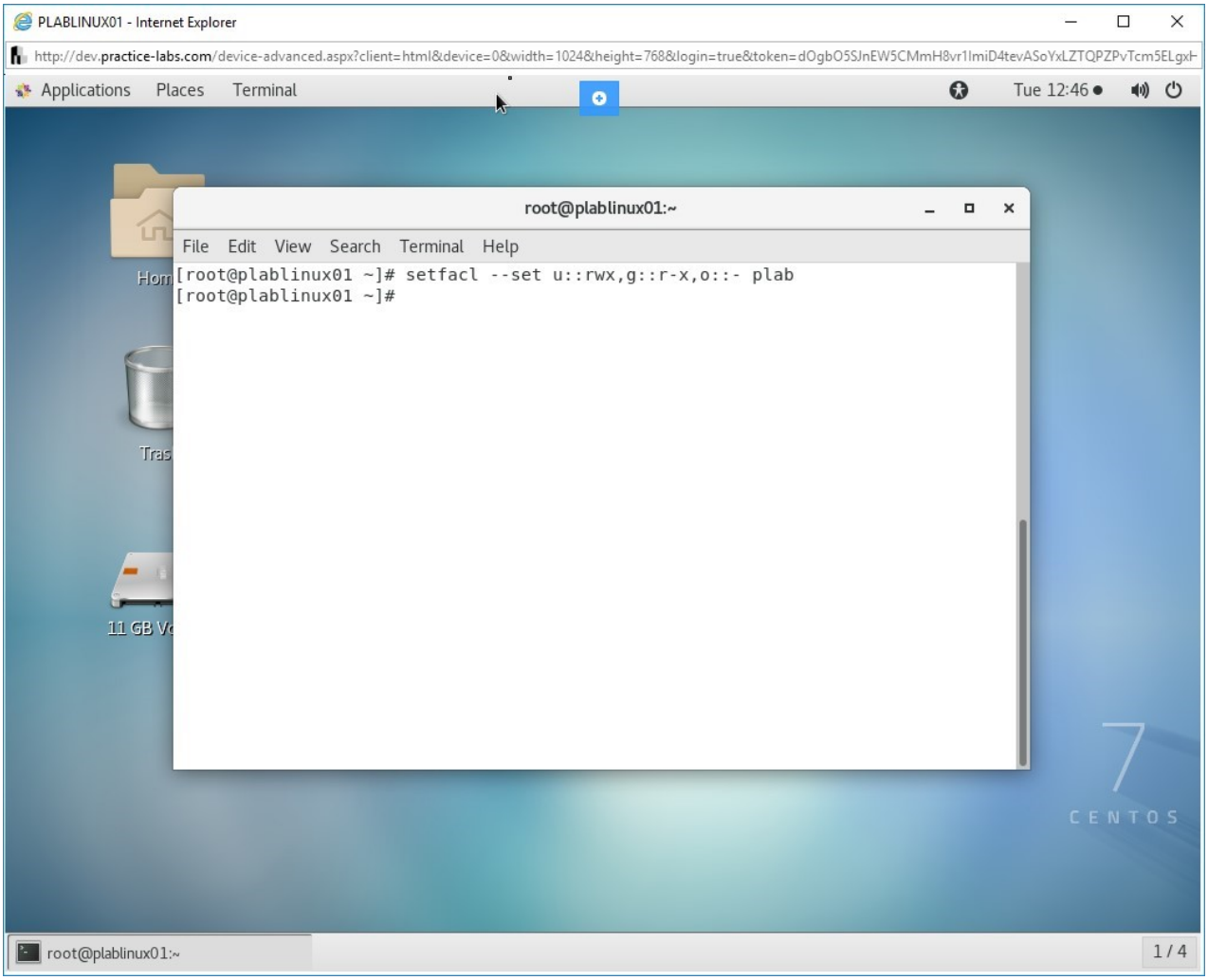


Figure 1.7 Screenshot of PLABLINUX01: Assigning an access ACL on the plab folder.

Step 8

You will now set the Default ACL with the help of **-d** parameter on the plab folder. Type the following command:

```
setfacl -d --set
u::rwx,u:administrator:rwx,u:matt:rx,g::rx,g:administrato
r:rx,o::- plab
```

Press **Enter**.

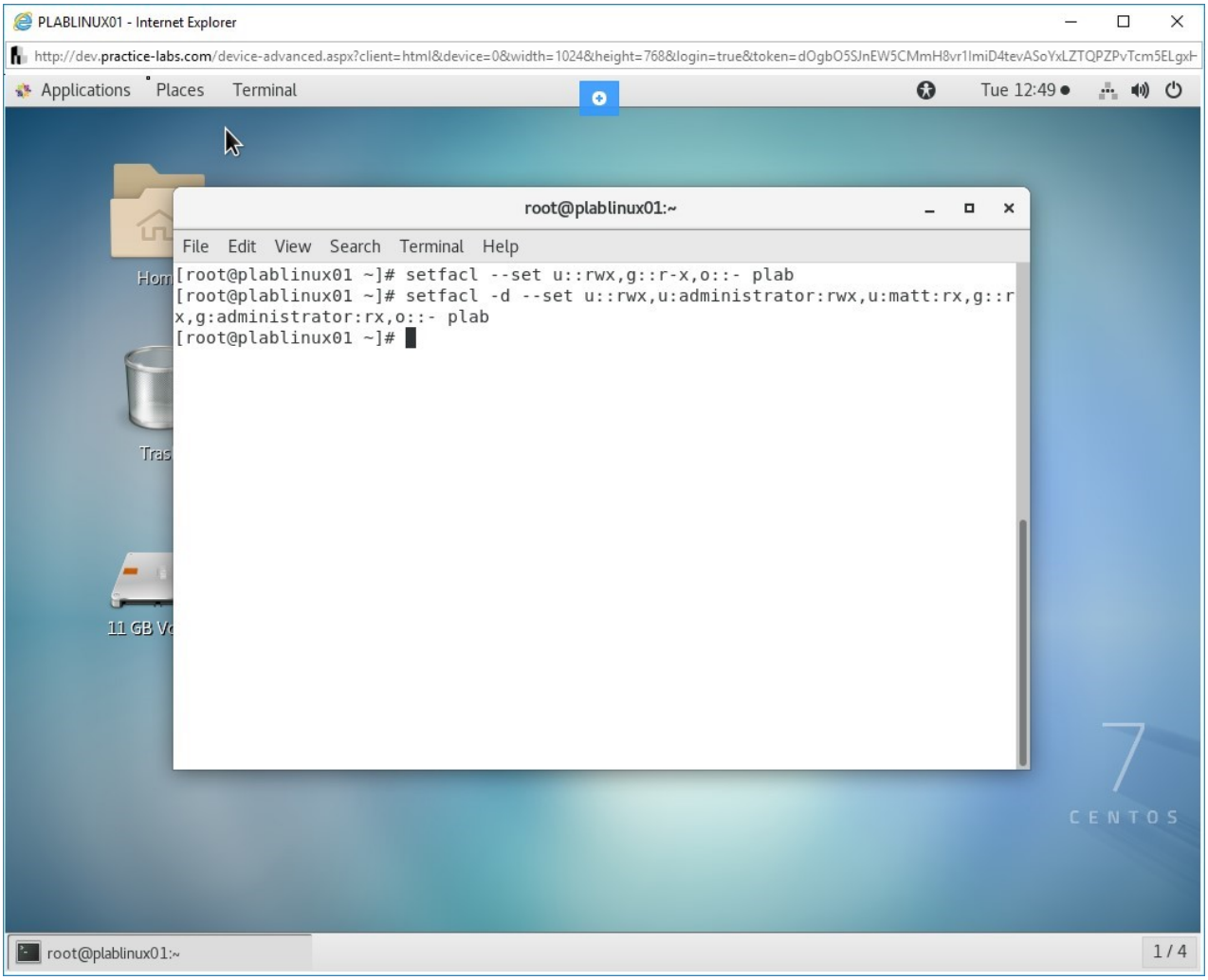


Figure 1.8 Screenshot of PLABLINUX01: Assigning a Default ACL on the plab folder.

Step 9

Let's now verify the ACL on the plab folder. Type the following command:

```
getfacl plab
```

Press **Enter**.

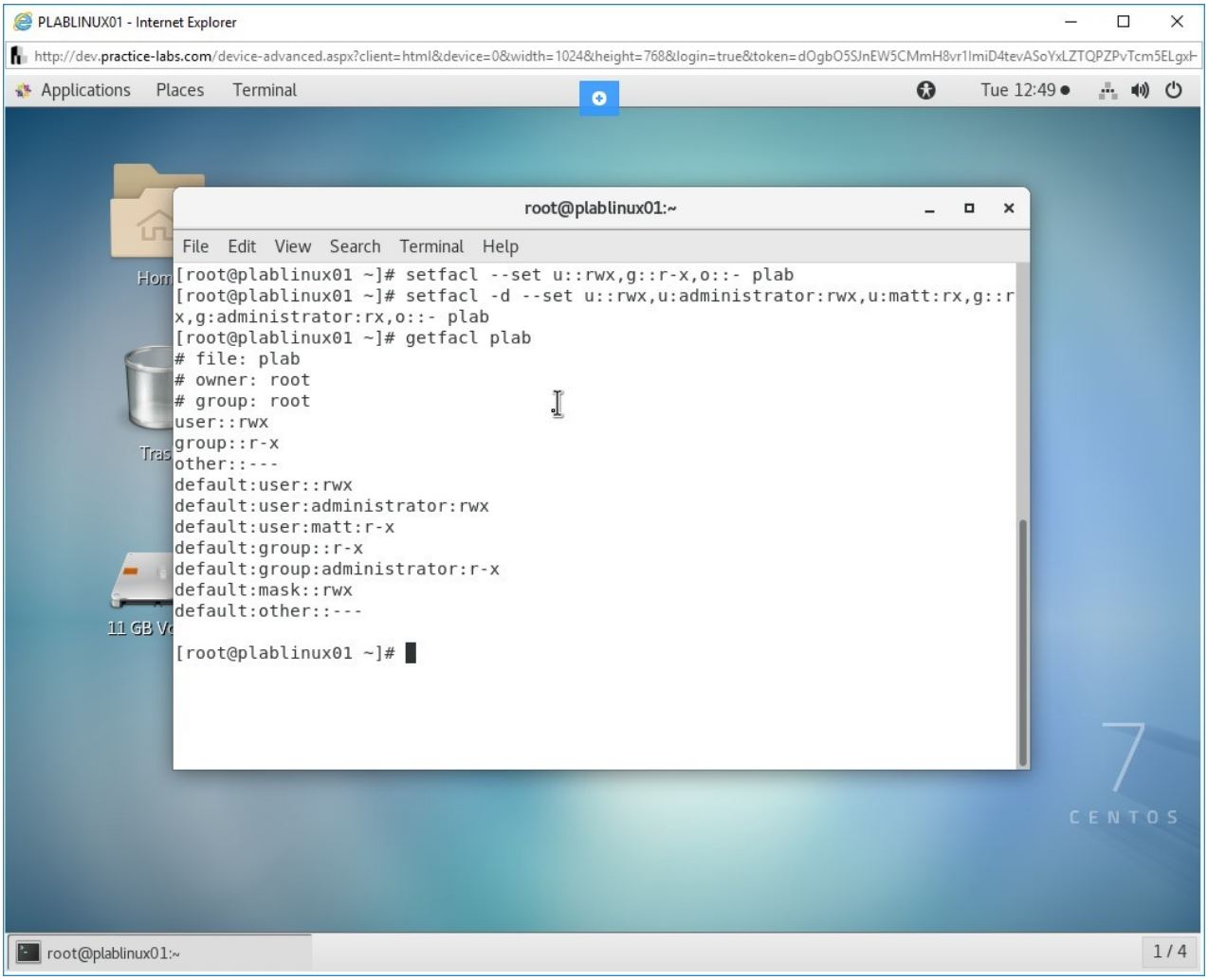


Figure 1.9 Screenshot of PLABLINUX01: Verifying the applied ACL on the plab folder.

Step 10

To navigate into the plab directory, type the following command:

```
cd plab
```

Press **Enter**.

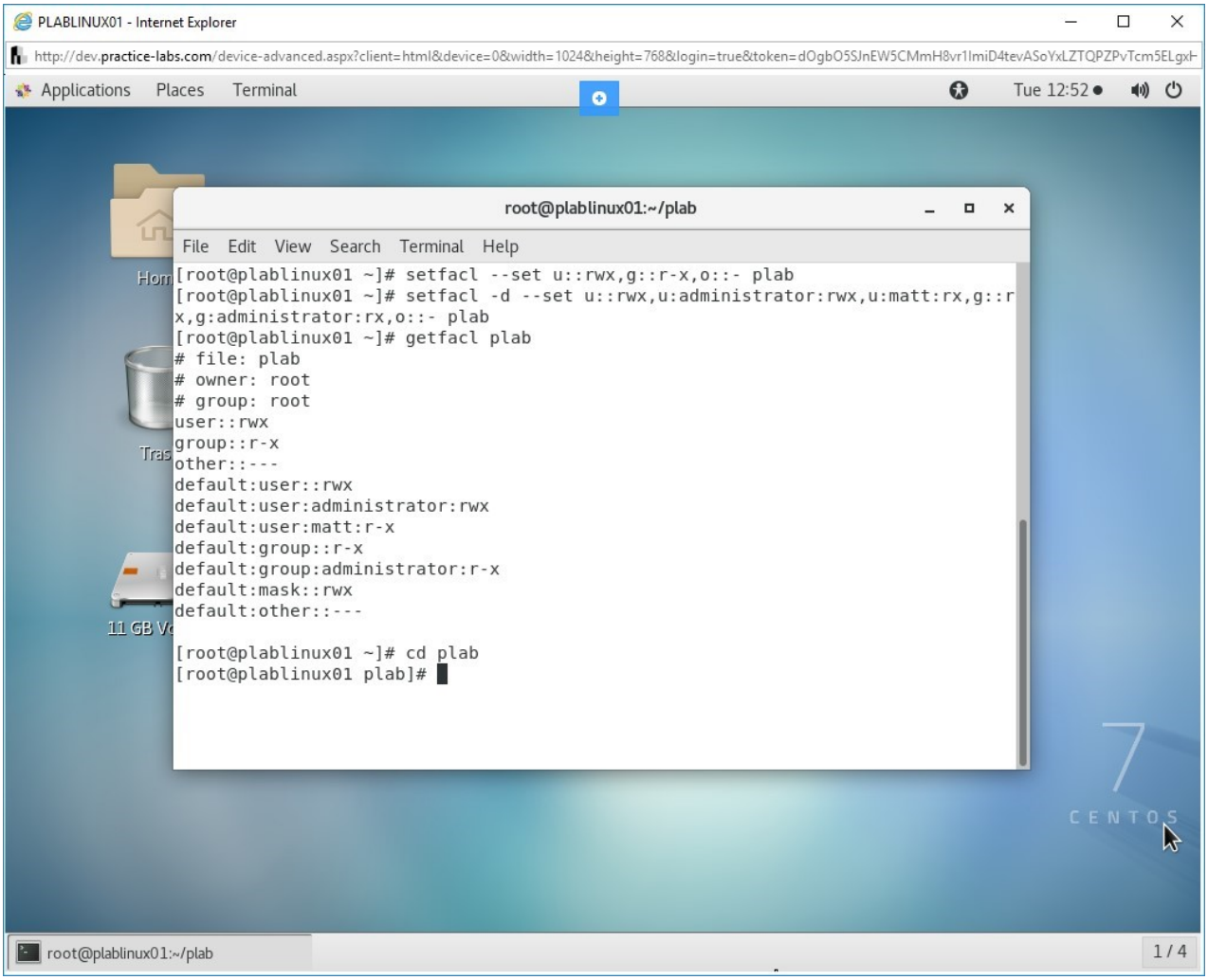


Figure 1.10 Screenshot of PLABLINUX01: Navigating the plab directory.

Step 11

Clear the screen by entering the following command:

```
clear
```

Notice that you are in the **plab** directory. You now need to create a new file to test whether the permissions from the parent folder have been inherited. Type the following command:

```
touch testfile
```

Press **Enter**. Notice the new file named **testfile** is now created.

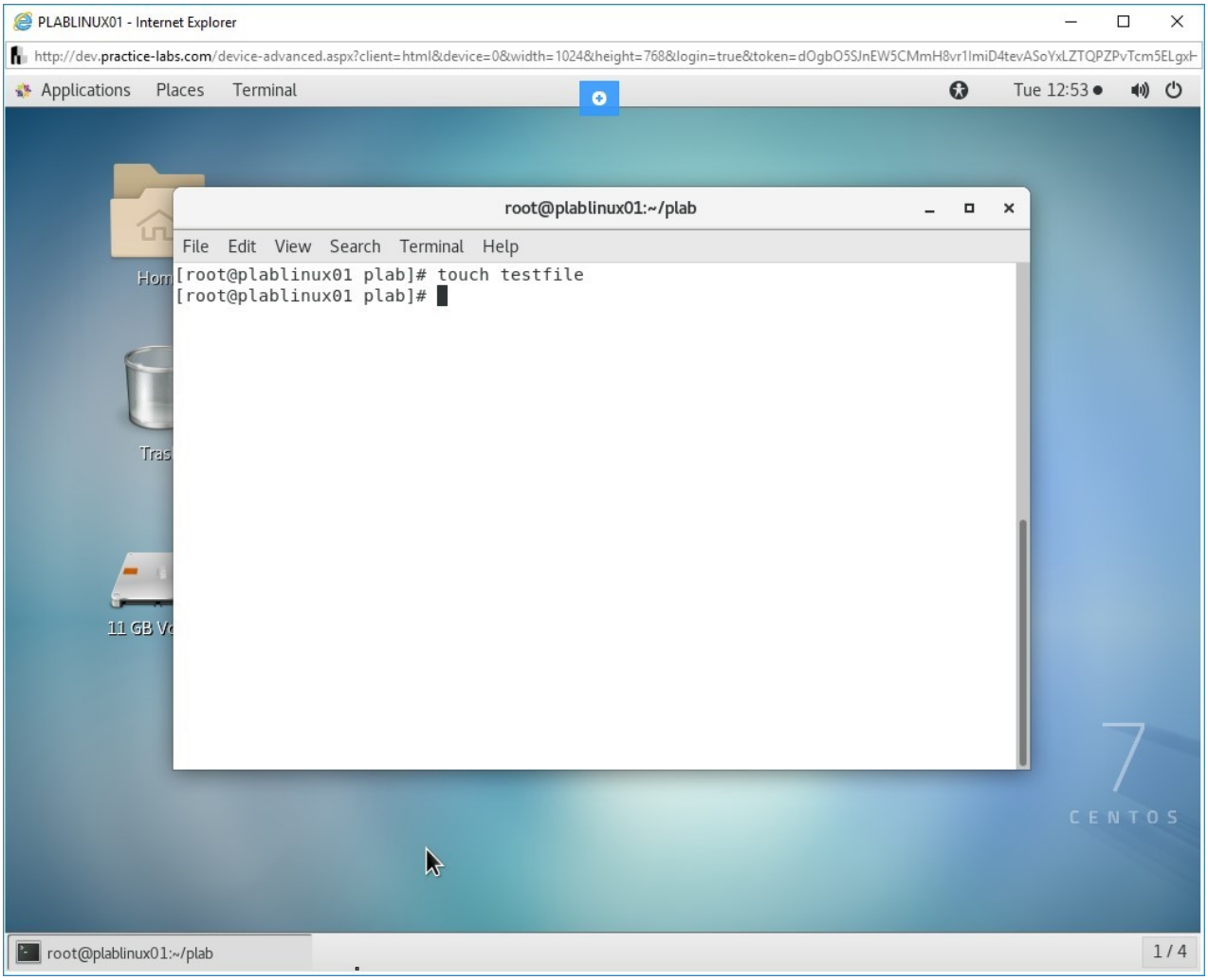


Figure 1.11 Screenshot of PLABLINUX01: Creating a new file named testfile.

Step 12

Let's now verify the ACL on the testfile file. Type the following command:

```
getfacl testfile
```

Press **Enter**. Notice that the access ACL has been applied because it has been inherited from the **plab** directory. Remember Default ACL does not apply to the files but only to the directories.

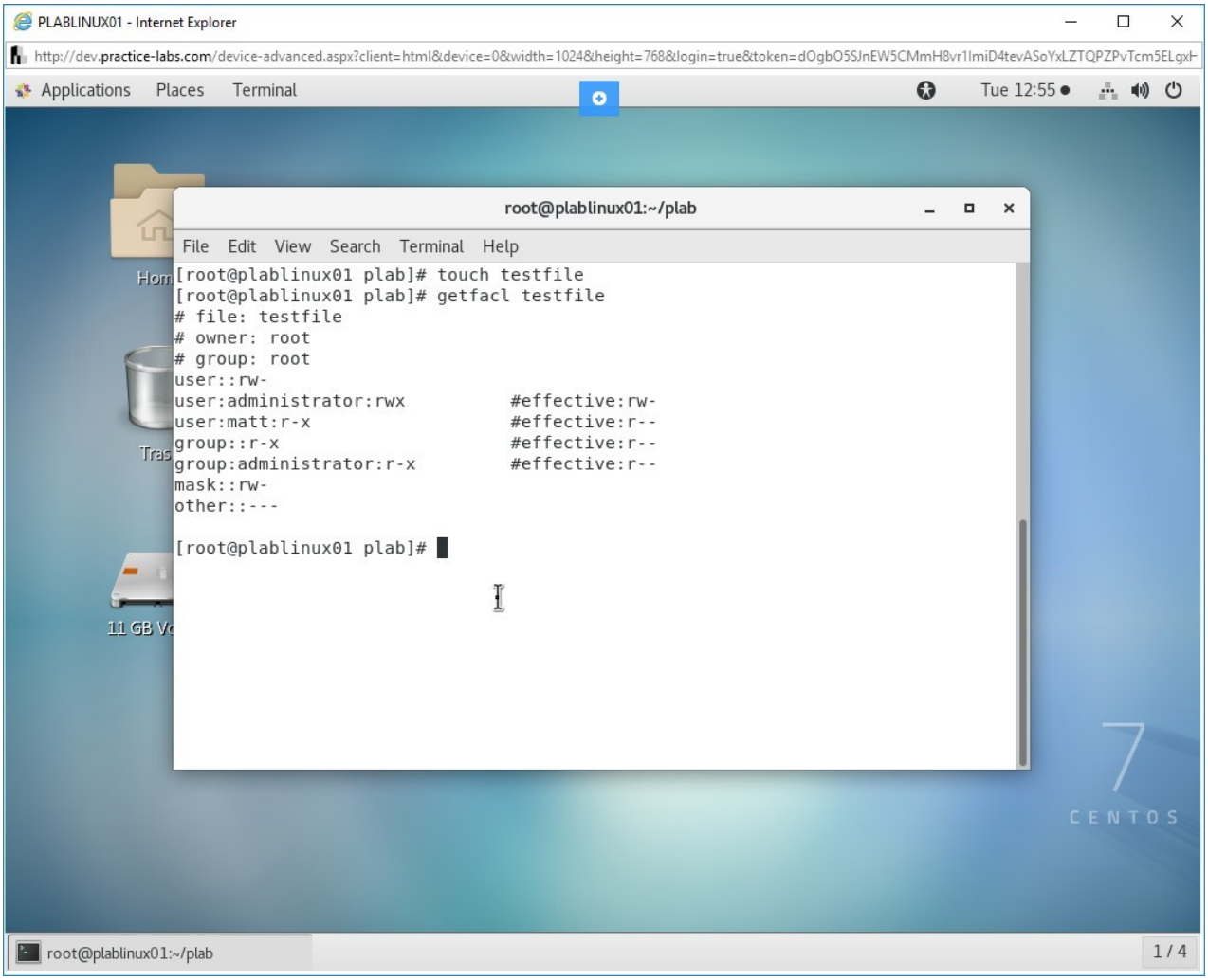


Figure 1.12 Screenshot of PLABLINUX01: Getting the ACL of the testfile file.

Step 13

Clear the screen by entering the following command:

```
clear
```

Let's create a subdirectory under the **plab** directory. Type the following command:

```
mkdir plabtest
```

Press **Enter**.

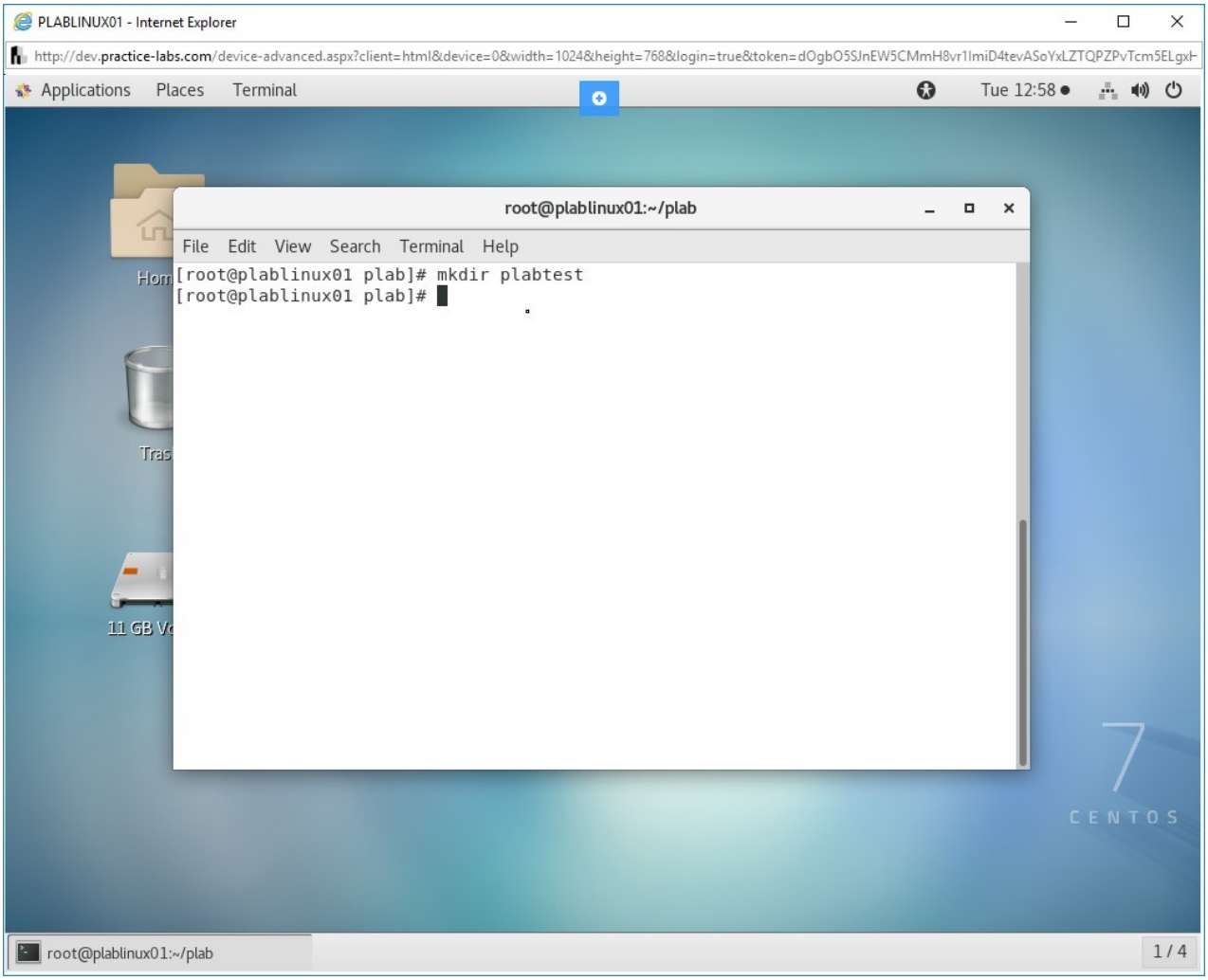


Figure 1.13 Screenshot of PLABLINUX01: Creating a subdirectory named plabtest.

Step 14

Let's now verify the ACL on the **plabtest** subdirectory. Type the following command:

```
getfacl plabtest
```

Press **Enter**. Notice that the permissions have been inherited from the **plab** directory. It has also inherited the group membership.

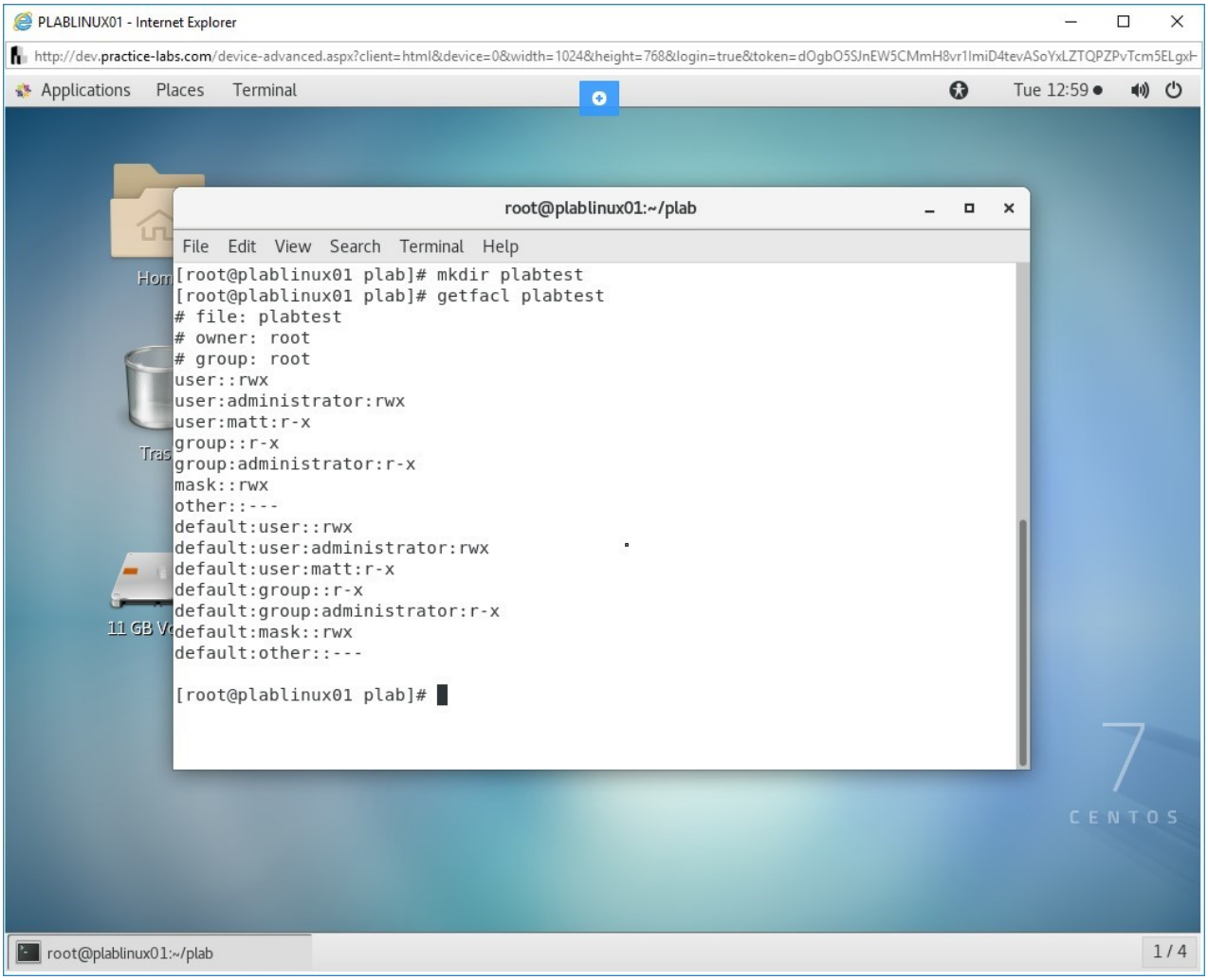


Figure 1.14 Screenshot of PLABLINUX01: Verifying the ACL on the plabtest directory.

Step 15

Navigate into the **plabtest** subdirectory. Type the following command:

```
cd plabtest
```

Press **Enter**.

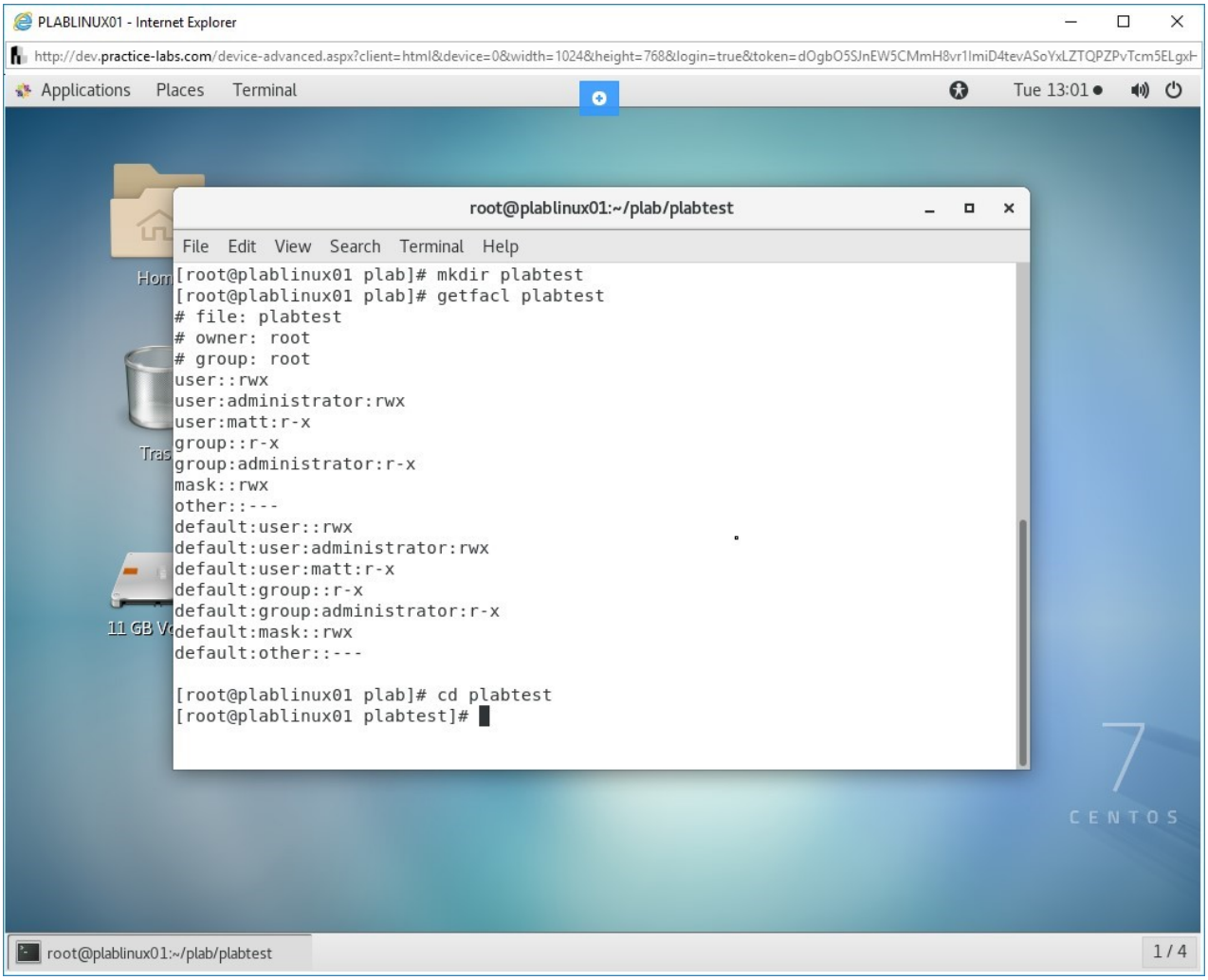


Figure 1.15 Screenshot of PLABLINUX01: Navigating to the plabtest directory.

Step 16

Clear the screen by entering the following command:

```
clear
```

Notice that you are in the **plabtest** subdirectory. You now need to create a new file to test whether the permissions from the parent folder have been inherited. Type the following command:

```
touch plabfile
```

Press **Enter**. Notice the new file named **plabfile** is now created.

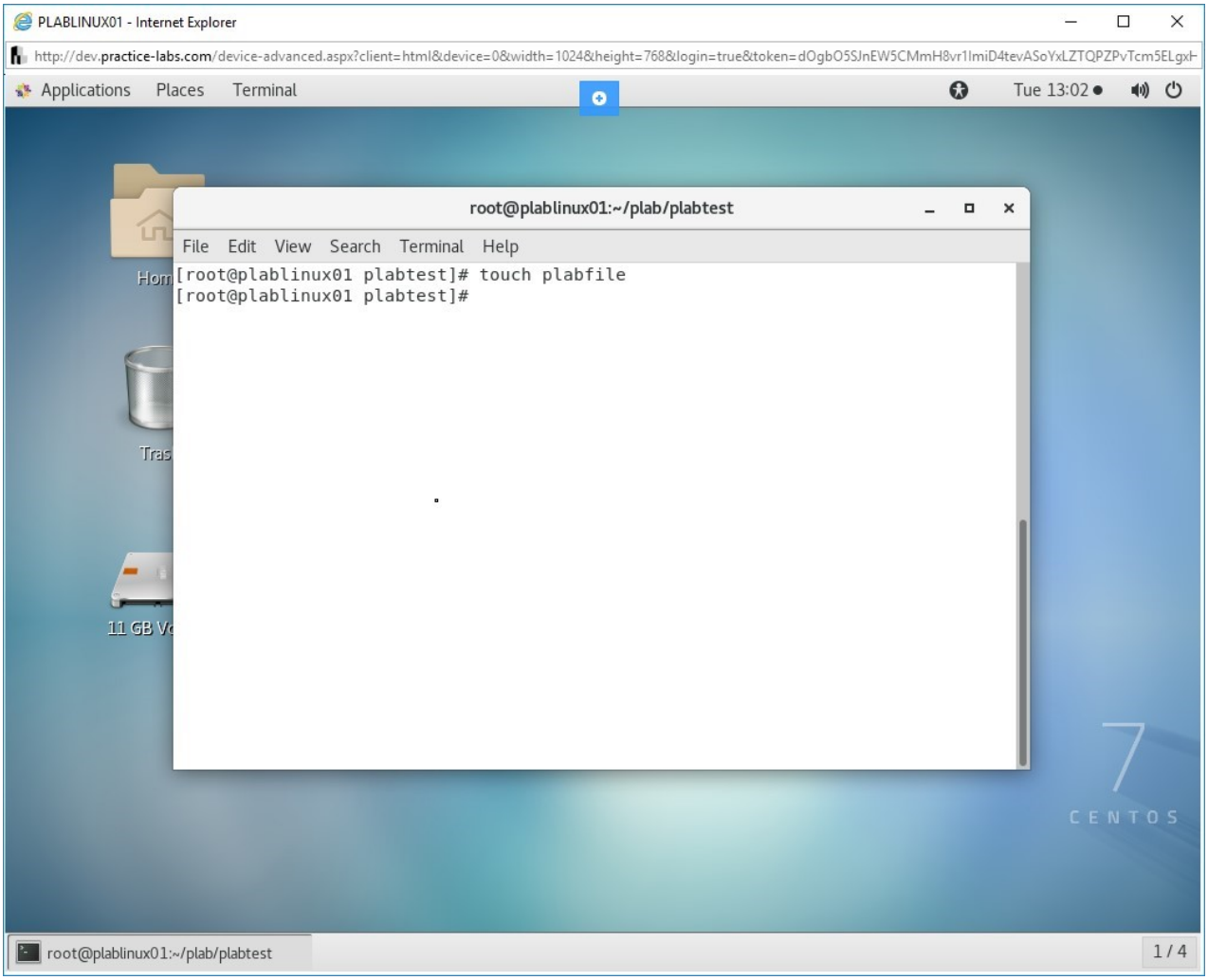


Figure 1.16 Screenshot of PLABLINUX01: Creating a new file named plabfile.

Step 17

Let's now verify the ACL on the **plabfile** file. Type the following command:

```
getfacl plabfile
```

Press **Enter**. Notice that the access ACL has been inherited from the **plabtest** directory, which inherited the ACL permissions from the **plab** directory.

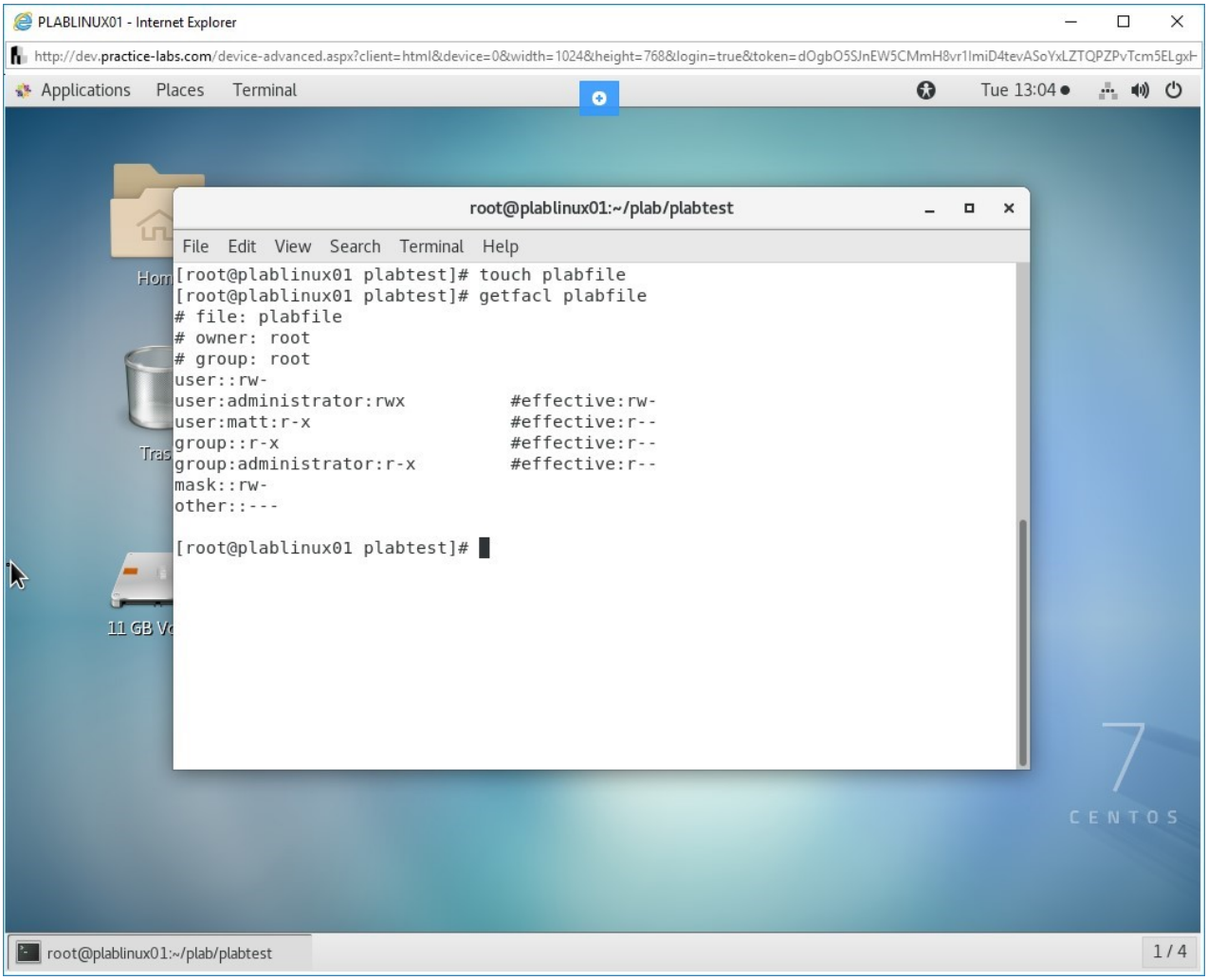


Figure 1.17 Screenshot of PLABLINUX01: Verifying the ACL on the plabfile.

Task 2 - Copy ACL

Assume that you have complex ACL and you do not want to re-create the ACL on another directory or file. You can copy the ACL from one file to another file. Default ACL can be applied from directory to directory.

In this task, you will learn to use Default ACL for permission inheritance. To use Default ACL for permission inheritance, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Let's first navigate to the root's home directory. Type the following command:

```
cd \
```

Press **Enter** twice.

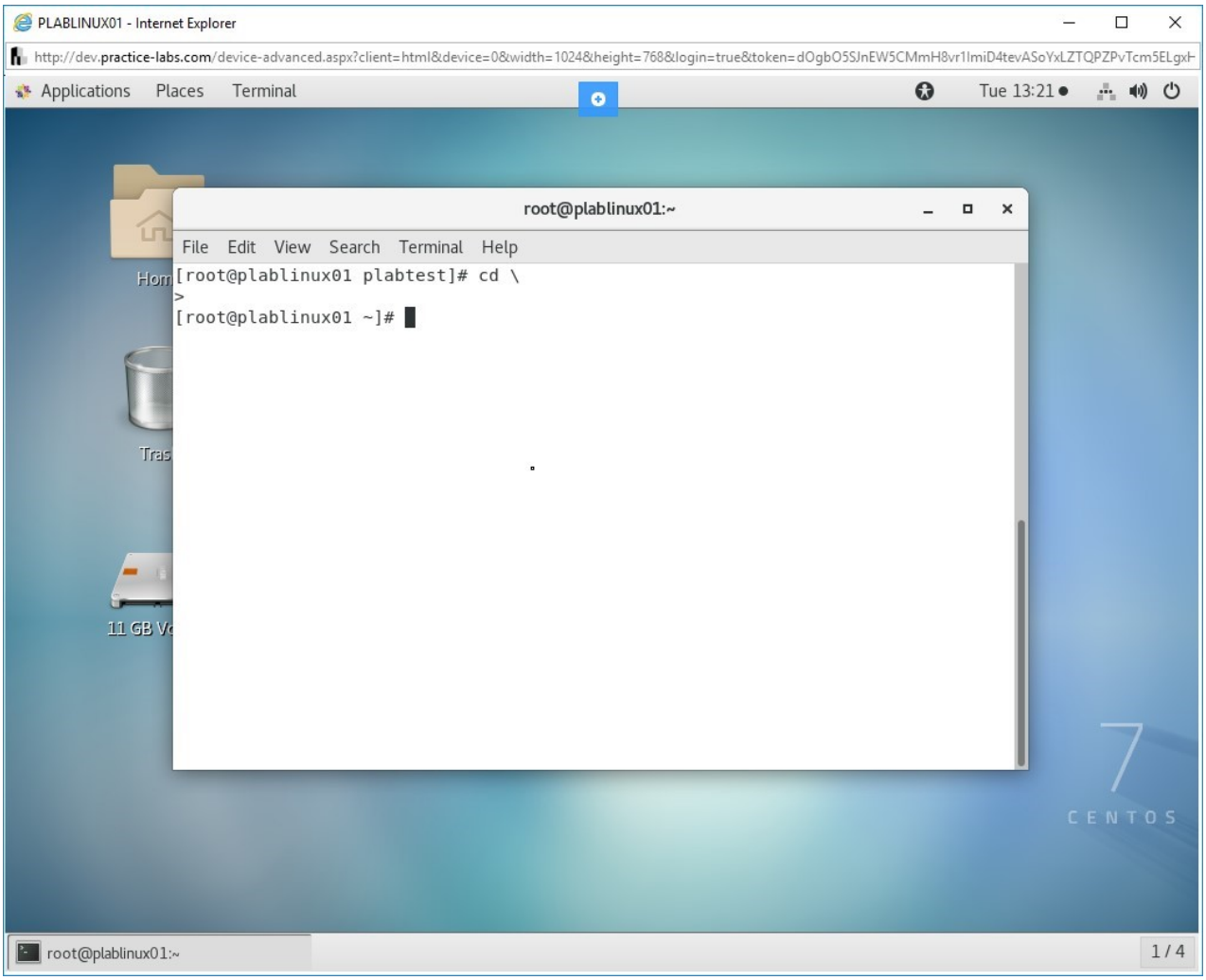


Figure 1.18 Screenshot of PLABLINUX01: Navigating to the home folder.

Step 2

You need to create now a new directory on which you will copy the plab directory's permissions. Type the following command:

```
mkdir plabnew
```

Press **Enter**.

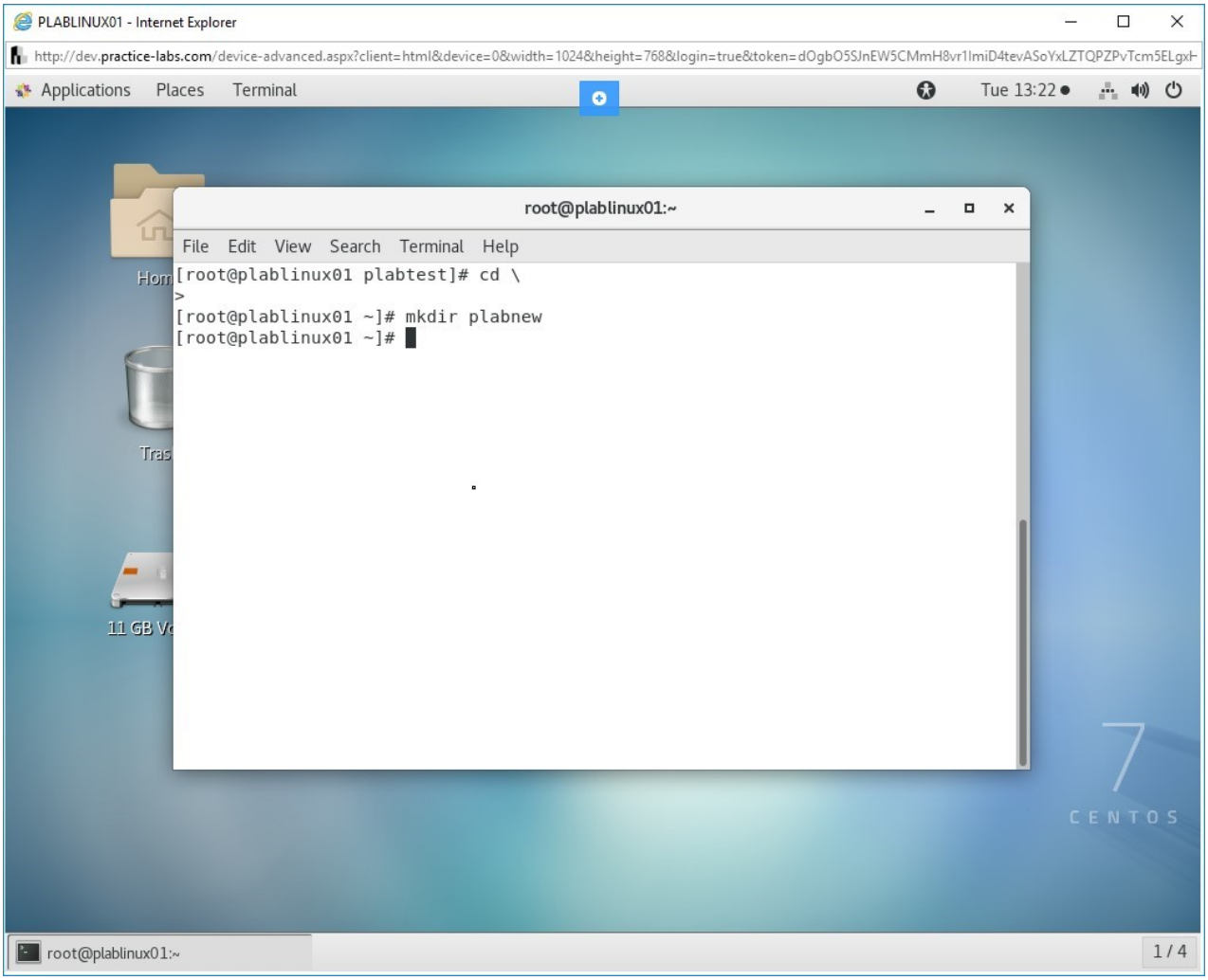


Figure 1.19 Screenshot of PLABLINUX01: Creating a new directory named plabnew.

Step 3

You need to copy the Default ACL to the **plabnew** directory. Type the following command:

```
getfacl -d plab | setfacl -d --set-file=- plabnew
```

Press **Enter**.

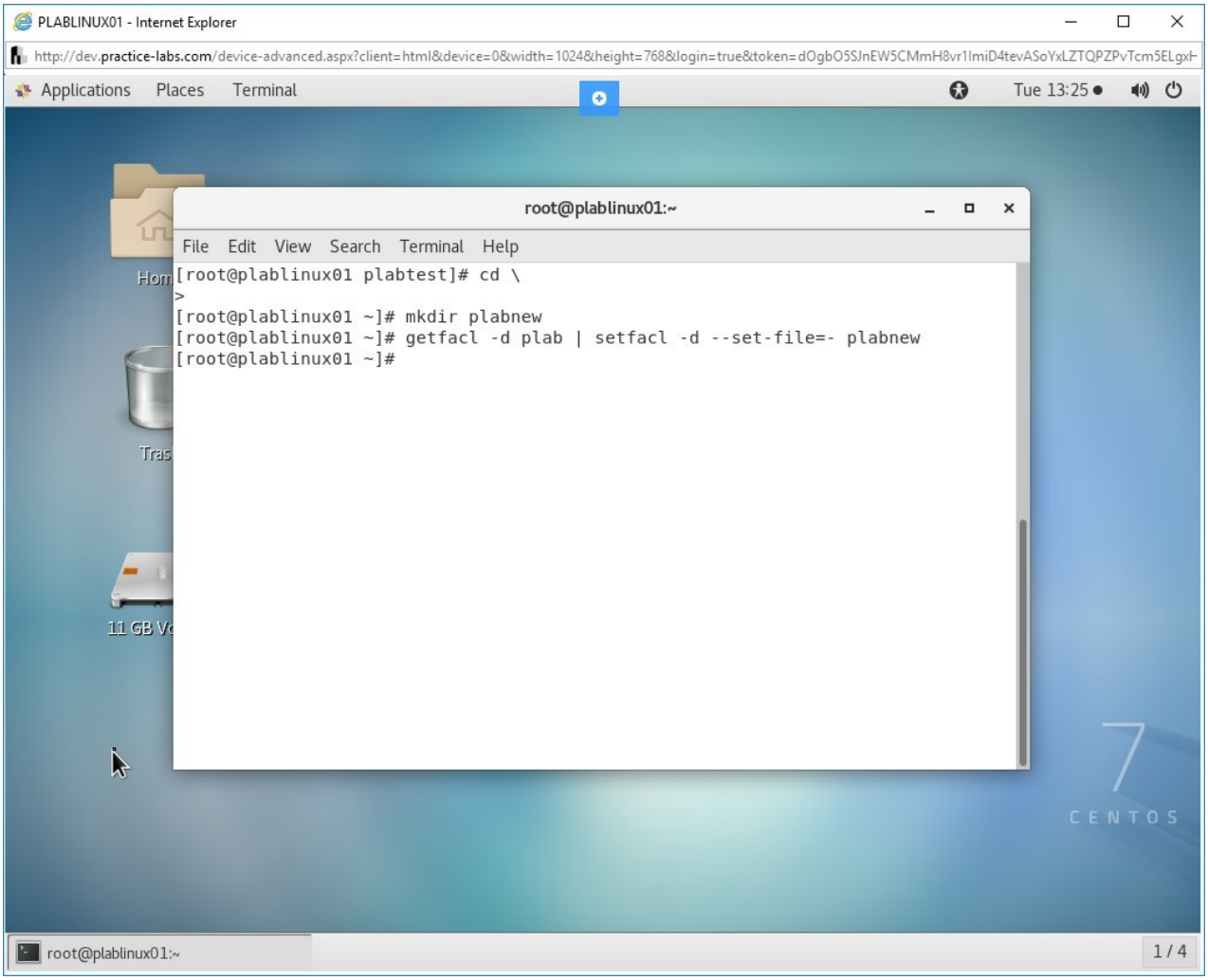


Figure 1.20 Screenshot of PLABLINUX01: Copying the Default ACL from the plab directory to the plabnew directory.

Step 4

You can now verify if the ACL has been copied on the plabnew directory. Type the following command:

```
getfacl plabnew
```

Press **Enter**.

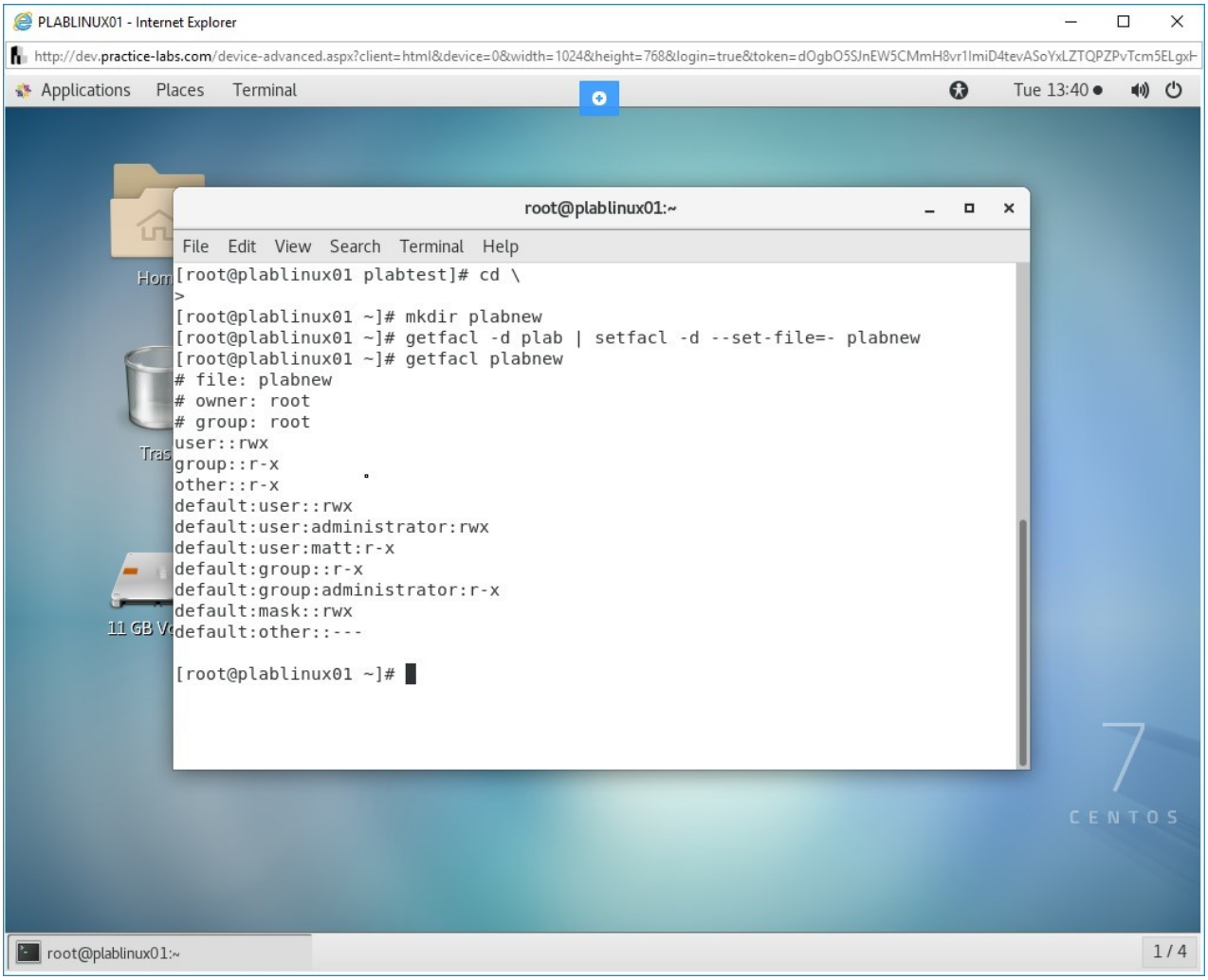


Figure 1.21 Screenshot of PLABLINUX01: Verifying the ACL on the plabnew directory.

Task 3 - Archive and Restore ACL

Just like archiving files, it is also possible to archive and restore ACL.

In this task, you will learn to archive and restore ACL. To archive and restore ACL, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Let's first navigate to the root's home directory. Type the following command:

```
getfacl -R plab > plab.facl
```

Press **Enter**.

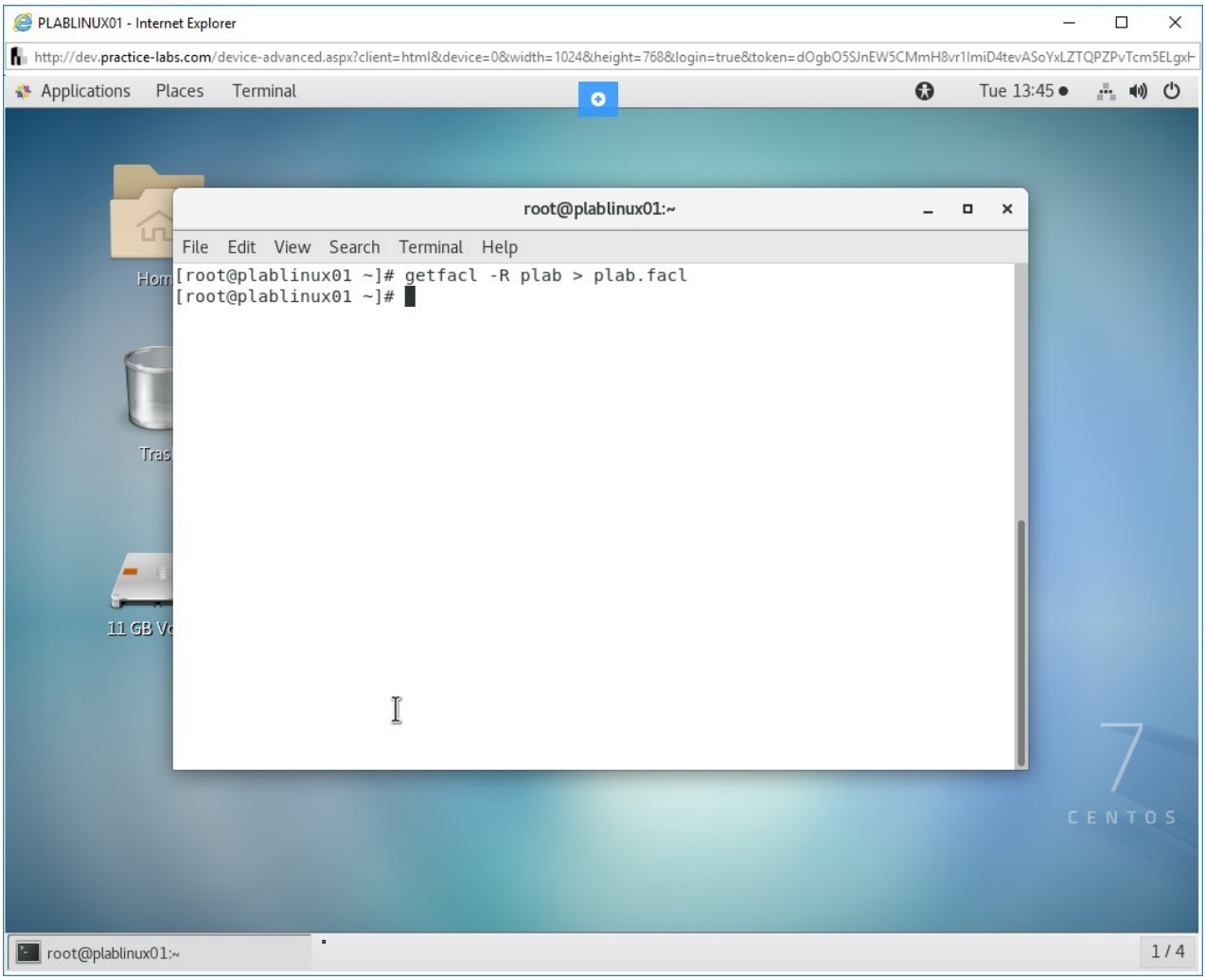


Figure 1.22 Screenshot of PLABLINUX01: Archiving the ACLs from the plab directory.

Step 2

Let's verify if the **plab.facl** file has been created. Type the following command:

```
ls -l
```

Press **Enter**. Notice that the plab.facl file has been created.

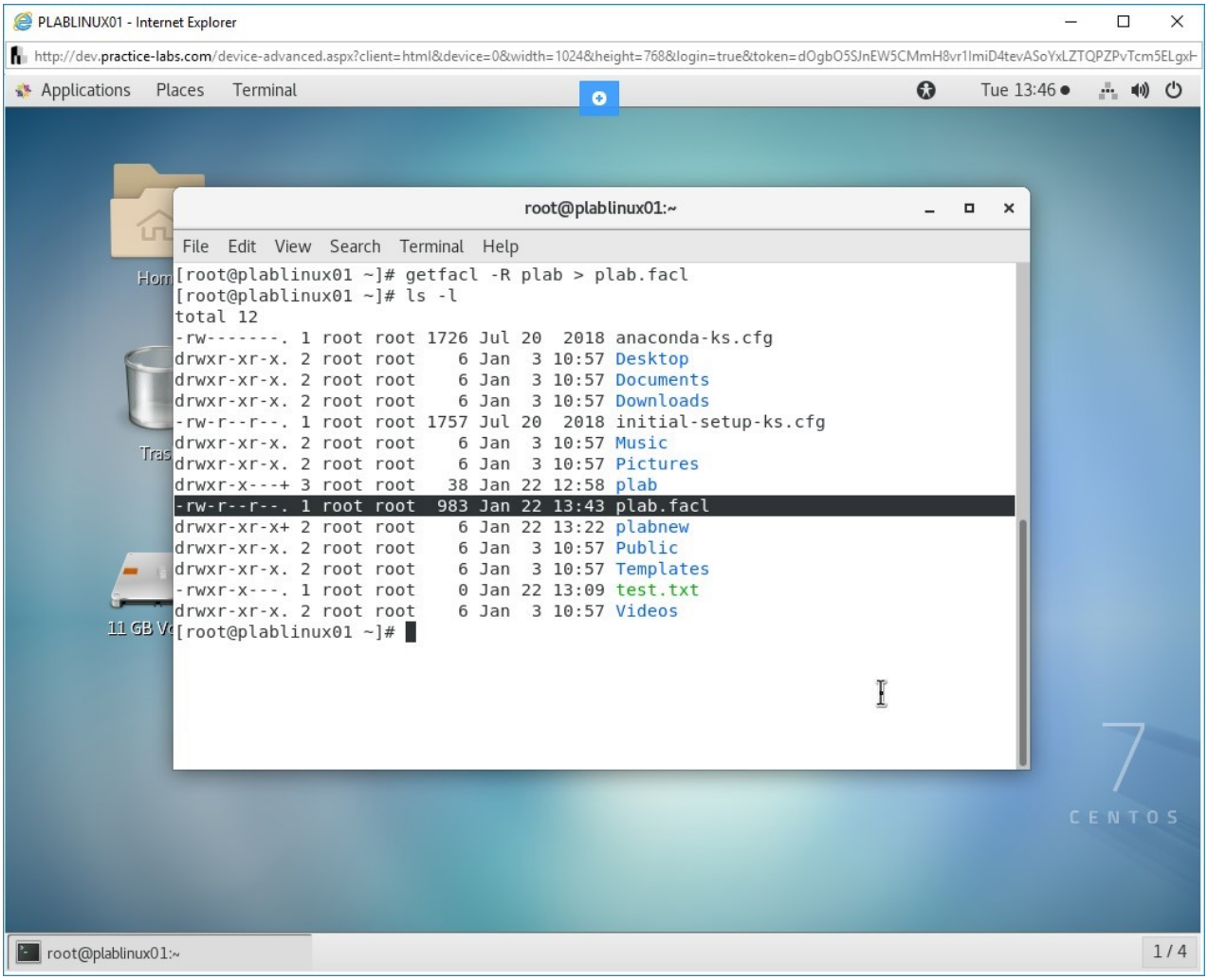


Figure 1.23 Screenshot of PLABLINUX01: Listing the files to ensure plab.facl file is generated.

Step 3

Clear the screen by entering the following command:

```
clear
```

To restore the **plab.facl** file, type the following command:

```
setfacl --restore plab.facl
```

Press **Enter**. Notice that the command does not return any output, which means that the restore is successful.

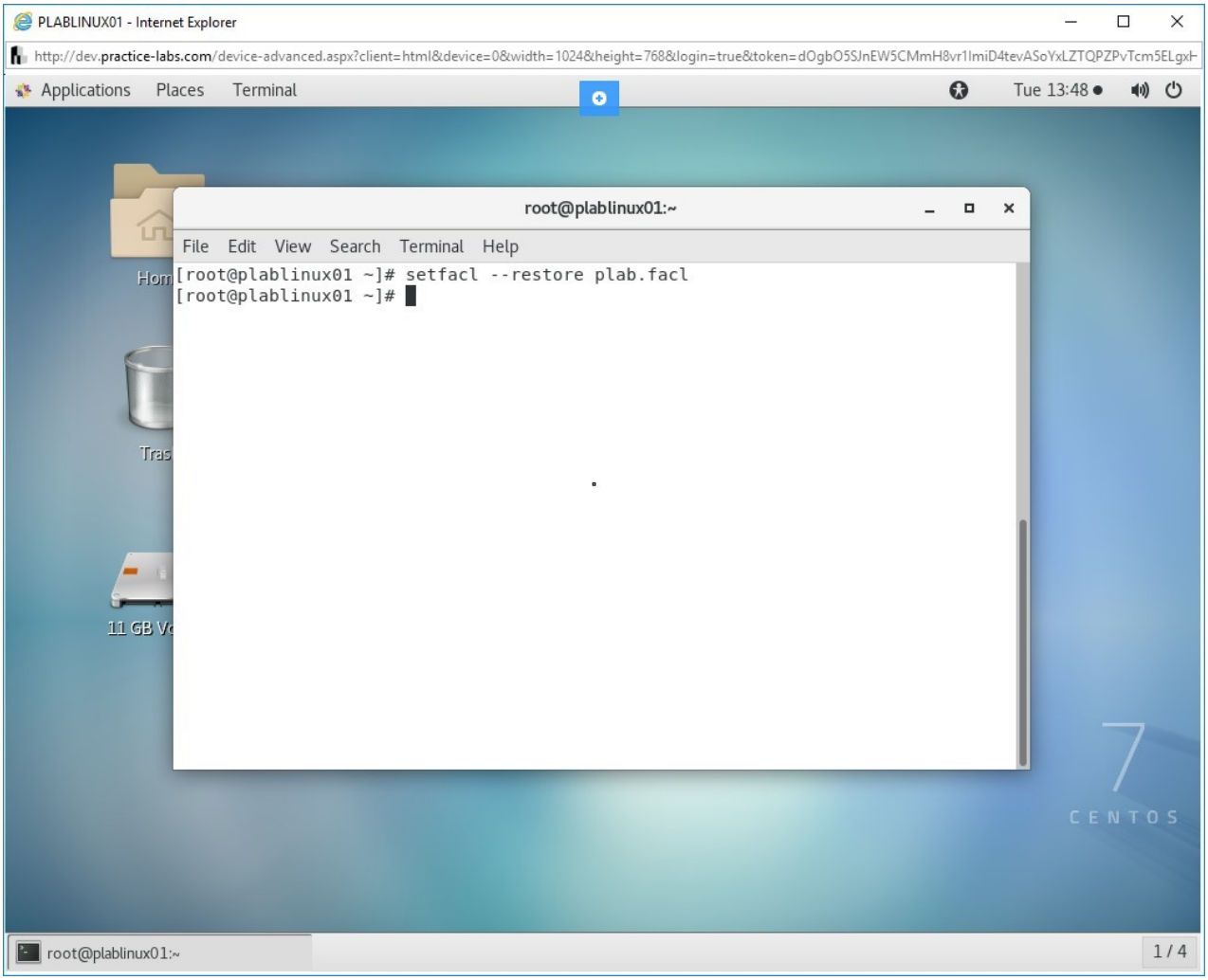


Figure 1.24 Screenshot of PLABLINUX01: Restoring the plab.facl file.

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

Review

Well done, you have completed the **Configure Inheritance and Group Memberships** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Configure Inheritance and Group Memberships

You should now be able to:

- Use default ACL for permission inheritance

- Copy ACL
- Archive and restore ACL

Feedback

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