CompTIA Linux+

Amending Hard and Symbolic Links

Introduction

Welcome to the **Amending Hard and Symbolic Links** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Hard Links
Symbolic Links
Linux System

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Create and Change Hard and Symbolic Links

After completing this lab, you will be able to:

- Manage hard and/or symbolic links
- Use links to support system administrative tasks

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 104.6 Create and change hard and symbolic links
- **LPI:** 103.7 Search text files using regular expressions
- **CompTIA:** 2.3 Given a scenario, create, modify, and redirect files.

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.

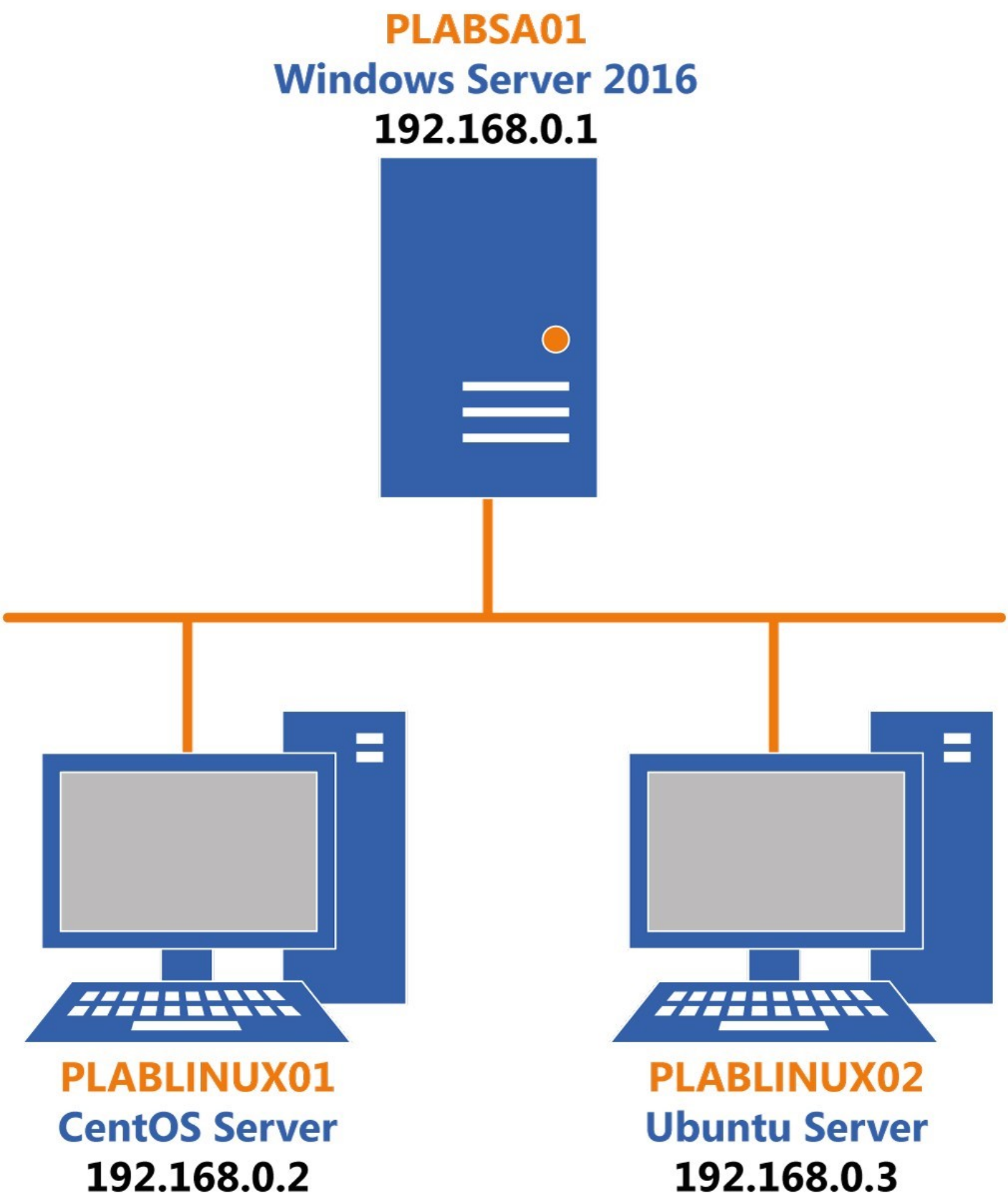
Help and Support

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 - Create and Change Hard and Symbolic Links

Sometimes, you may require a file to be accessed from multiple locations on a filesystem. One option is to create multiple copies of the source file. However, it will take much more space and also if the source file is updated, you would need to update the copies at all locations. Another option is to create a link of the source file at each required location. A link carries the metadata to the filesystem and is linked with the source file. These links can be hard links or symbolic links.

In this exercise, you will understand how to Create and change hard and symbolic links.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Manage hard and/or symbolic links
- Use links to support system administrative tasks

Your Devices

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

- **PLABSA01** (Windows Server 2016)
- **PLABLINUX01** (CentOS Server)
- **PLABLINUX02** (Ubuntu Server)

Task 1 - Manage Hard and/or Symbolic Links

There are two types of links that you can create for a source file:

- **Symbolic links**: It is a pointer to the source file. The permissions that apply to the source file also apply to the symbolic link. It can point to a source file on the local or remote filesystem.
- **Hard links**: It is another directory entry for the source file and carries those same properties, such as file permissions, of the source file. If you delete one file, the other file remains intact. A hard link must exist in the same local filesystem.

In this task, you will create a symbolic link and a hard link to a file.

To identify hard and/or symbolic links, perform the following steps:

Step 1

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

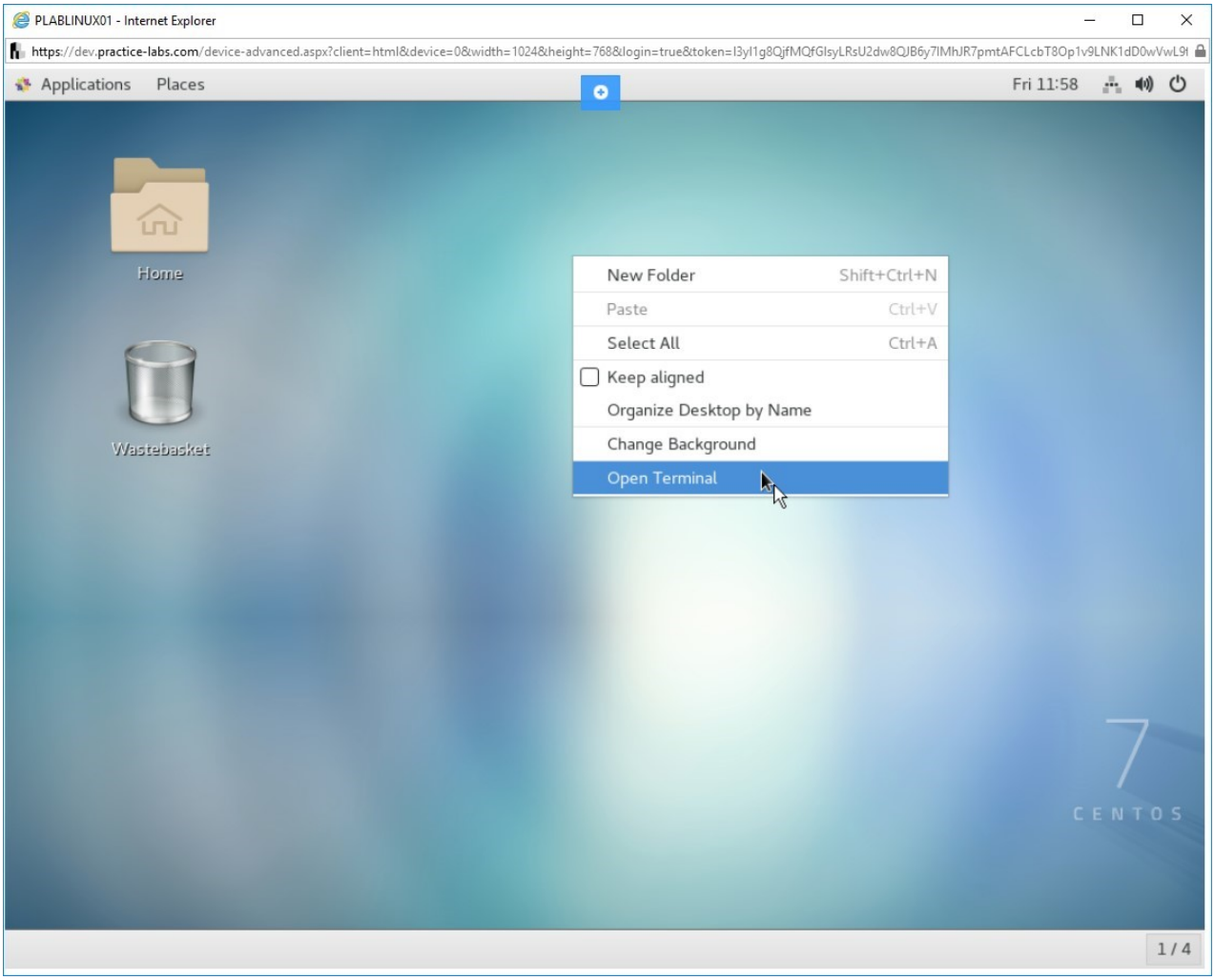


Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

Clear the screen by entering the following command:

```
clear
```

> ***Note**: The clear command can be used before every step to enable the learners to get a clear view of the output of each command. Otherwise, it is not mandatory to use the clear command before every command.*

You need to find the links in the **/etc** directory. To do this, type the following command:

```
ls -l /etc
```

Press **Enter**.

Note that **system-release** is pointing to another link **centos-release**.

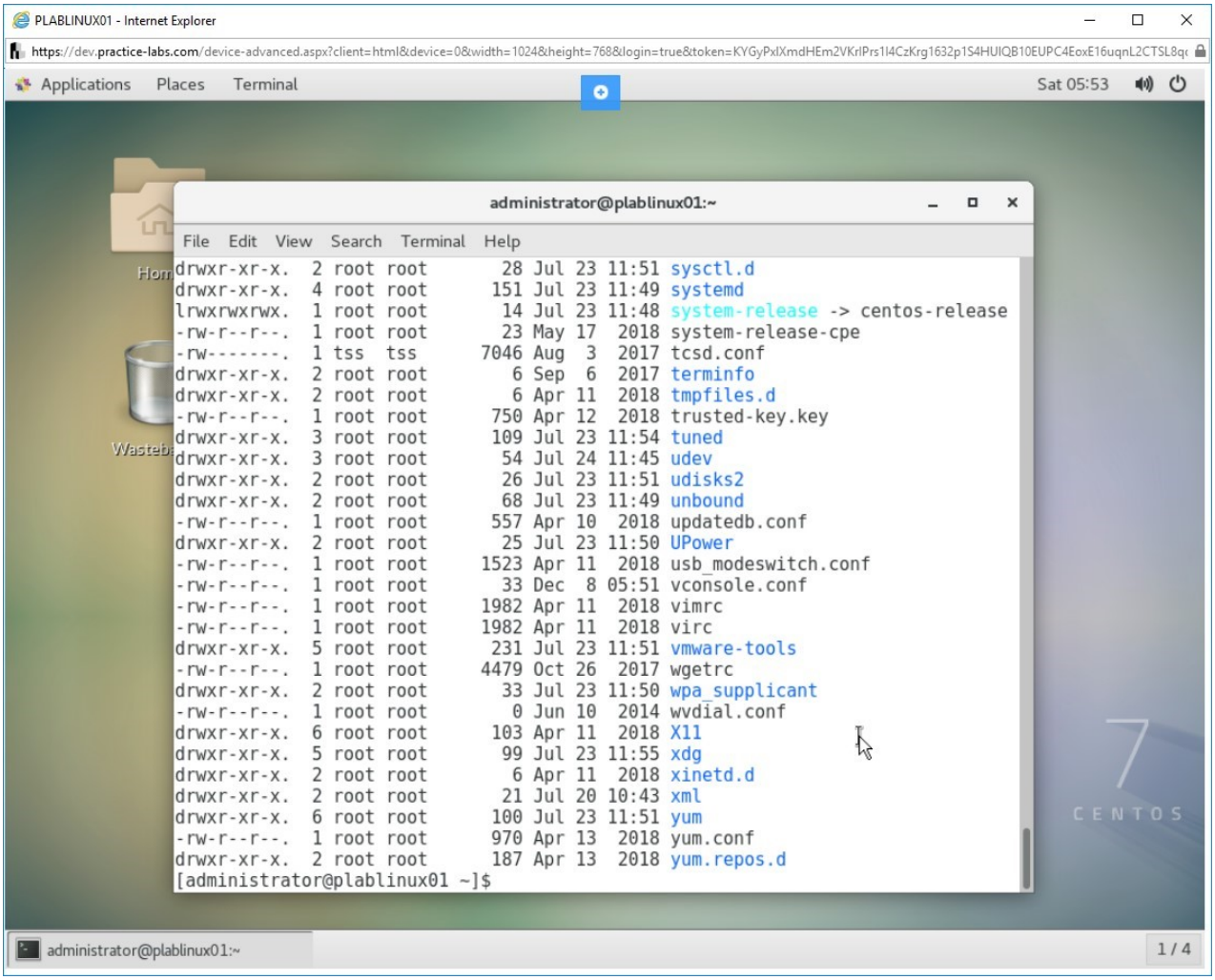


Figure 1.2 Screenshot of PLABLINUX01: Displaying the links in the /etc directory.

Step 3

Clear the screen by entering the following command:

```
clear
```

It is important to note that **sh** is also a symbolic link to **bash**. To verify this, type the following command:

```
ls -l /bin/bash /bin/sh
```

Press **Enter**.

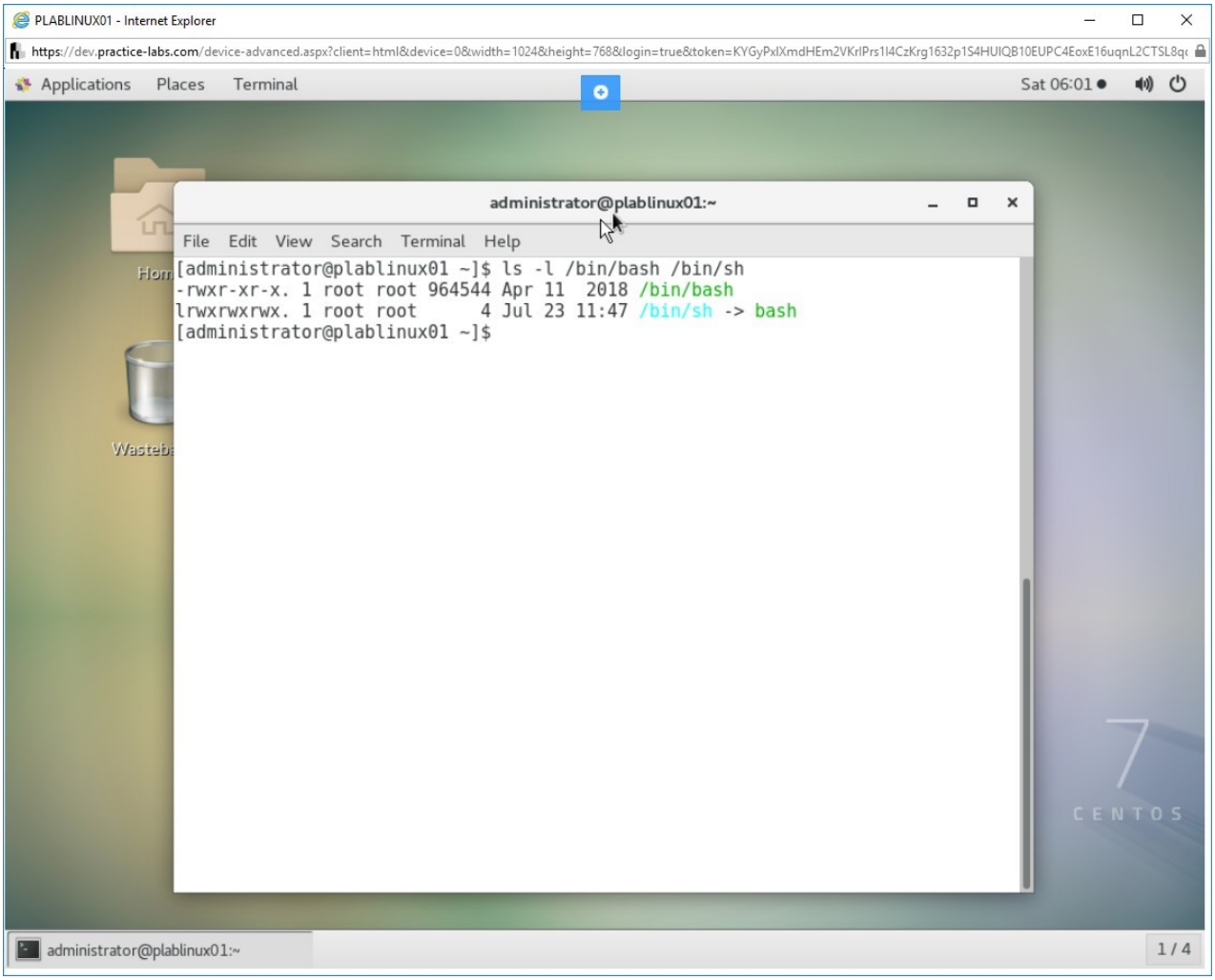


Figure 1.2 Screenshot of PLABLINUX01: Displaying sh as the symbolic link to bash.

Step 4

Clear the screen by entering the following command:

```
clear
```

You can use the **ln** command to create links. A new link is created and linked to the source file, which must exist on the local filesystem.

Let's create a new file named **testfile**. Type the following command:

```
touch testfile
```

Press **Enter**.

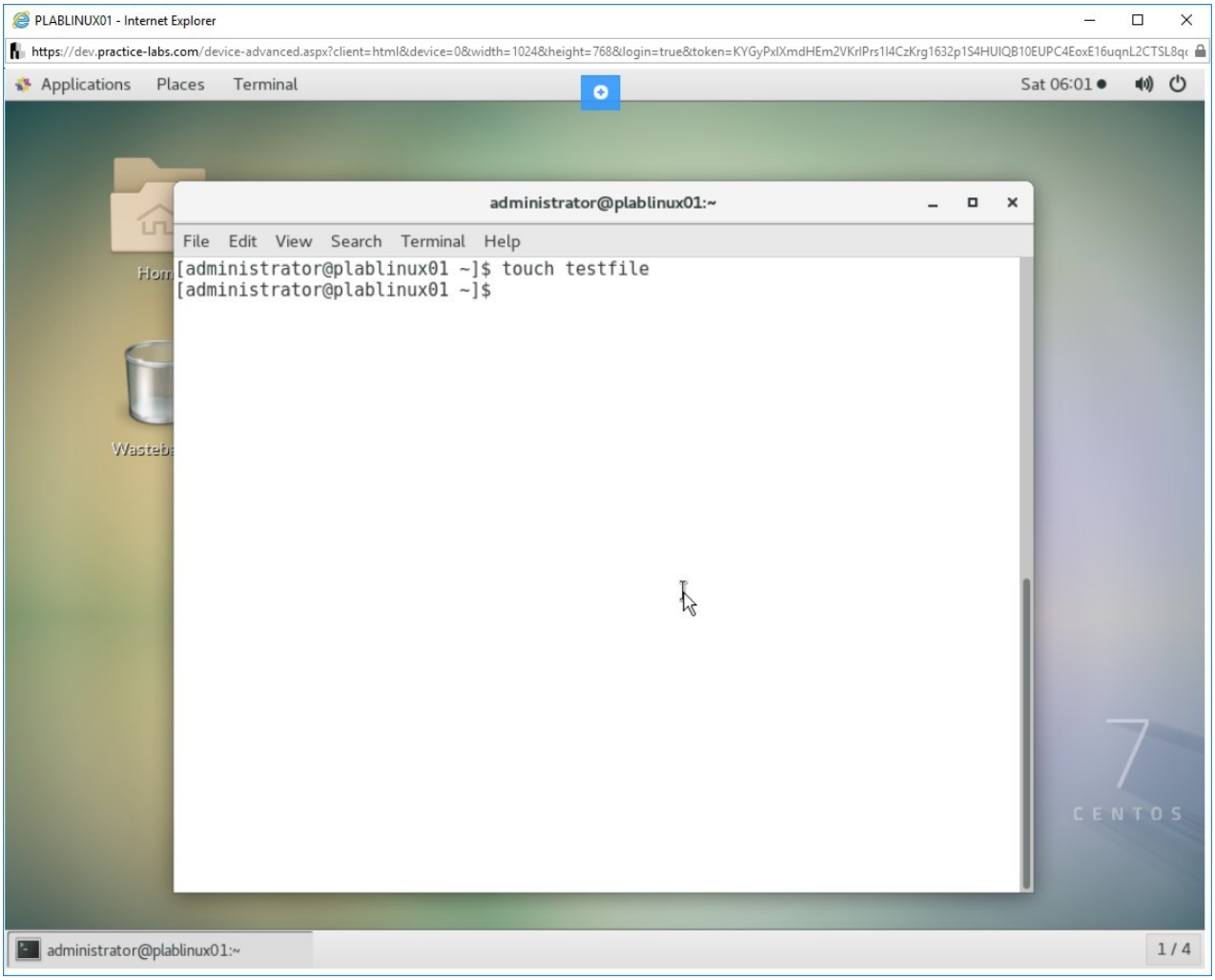


Figure 1.3 Screenshot of PLABLINUX01: Creating a file using the touch command.

Step 5

To create a link to **testfile**, type the following command:

```
ln -s testfile testlink
```

Press **Enter**.

> ***Note**: The -s parameter creates a symbolic link rather than a hard link.*

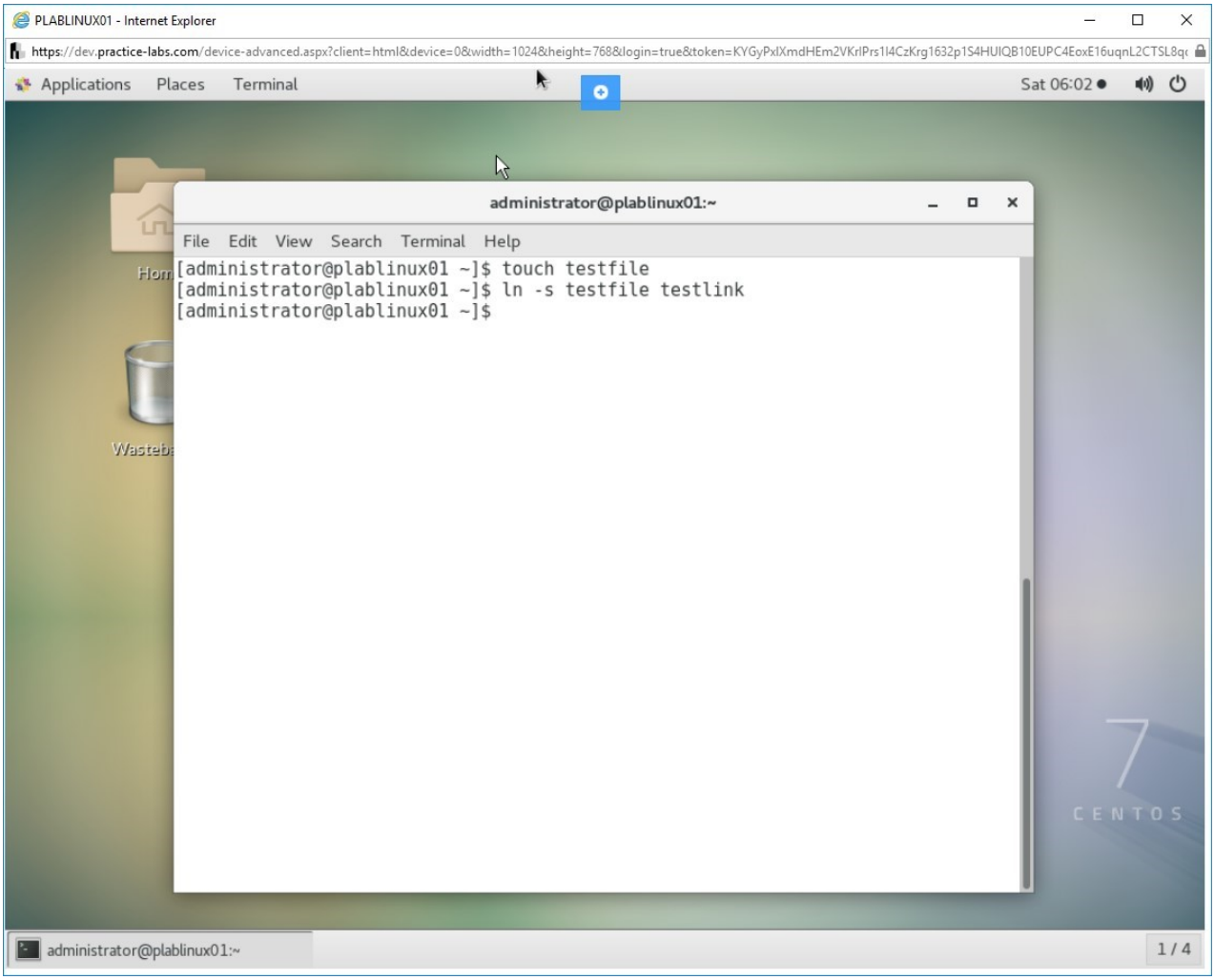


Figure 1.4 Screenshot of PLABLINUX01: Creating a link named testlink to testfile.

Step 6

To verify whether the symbolic link is created, type the following command:

```
ls -l
```

Press **Enter**.

The symbolic links are identified with the -> arrow.

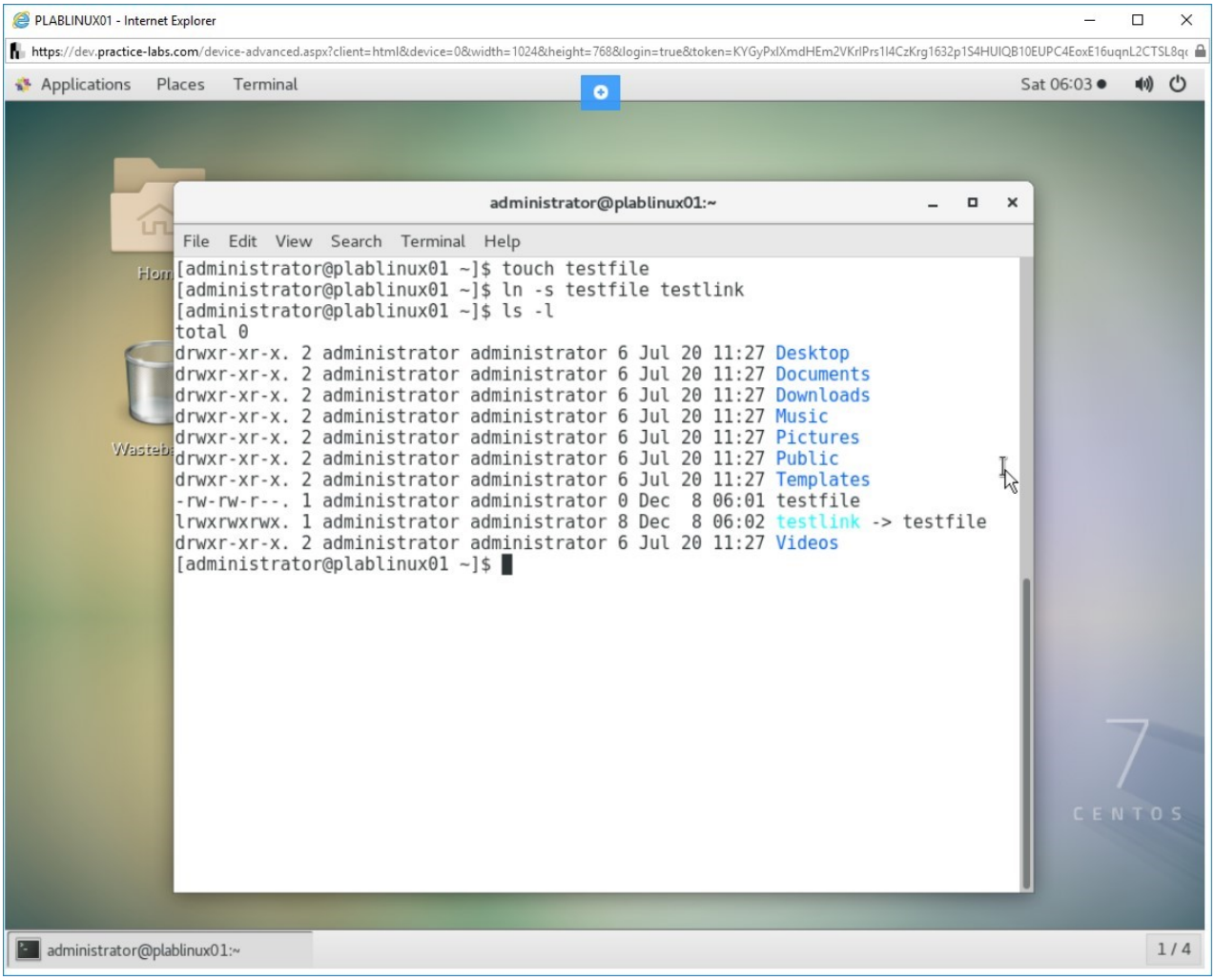


Figure 1.5 Screenshot of PLABLINUX01: Listing the directory contents using the ls -l command.

Step 7

Clear the screen by entering the following command:

```
clear
```

To create a hard link, type the following command:

```
ln testfile testlink1
```

Press **Enter**.

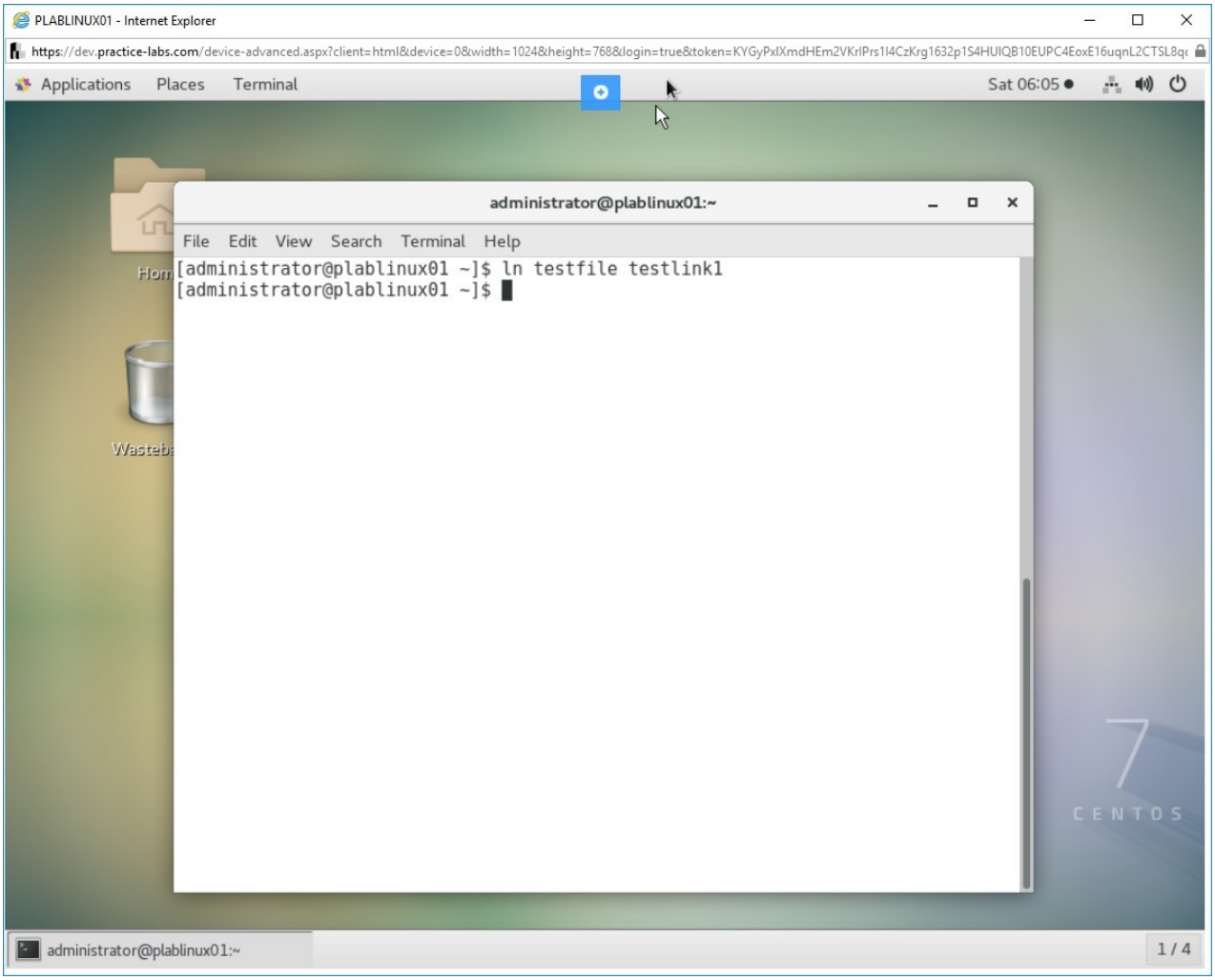


Figure 1.6 Screenshot of PLABLINUX01: Creating a hard link.

Step 8

To verify whether the hard link has been created, type the following command:

```
ls -l
```

Press **Enter**.

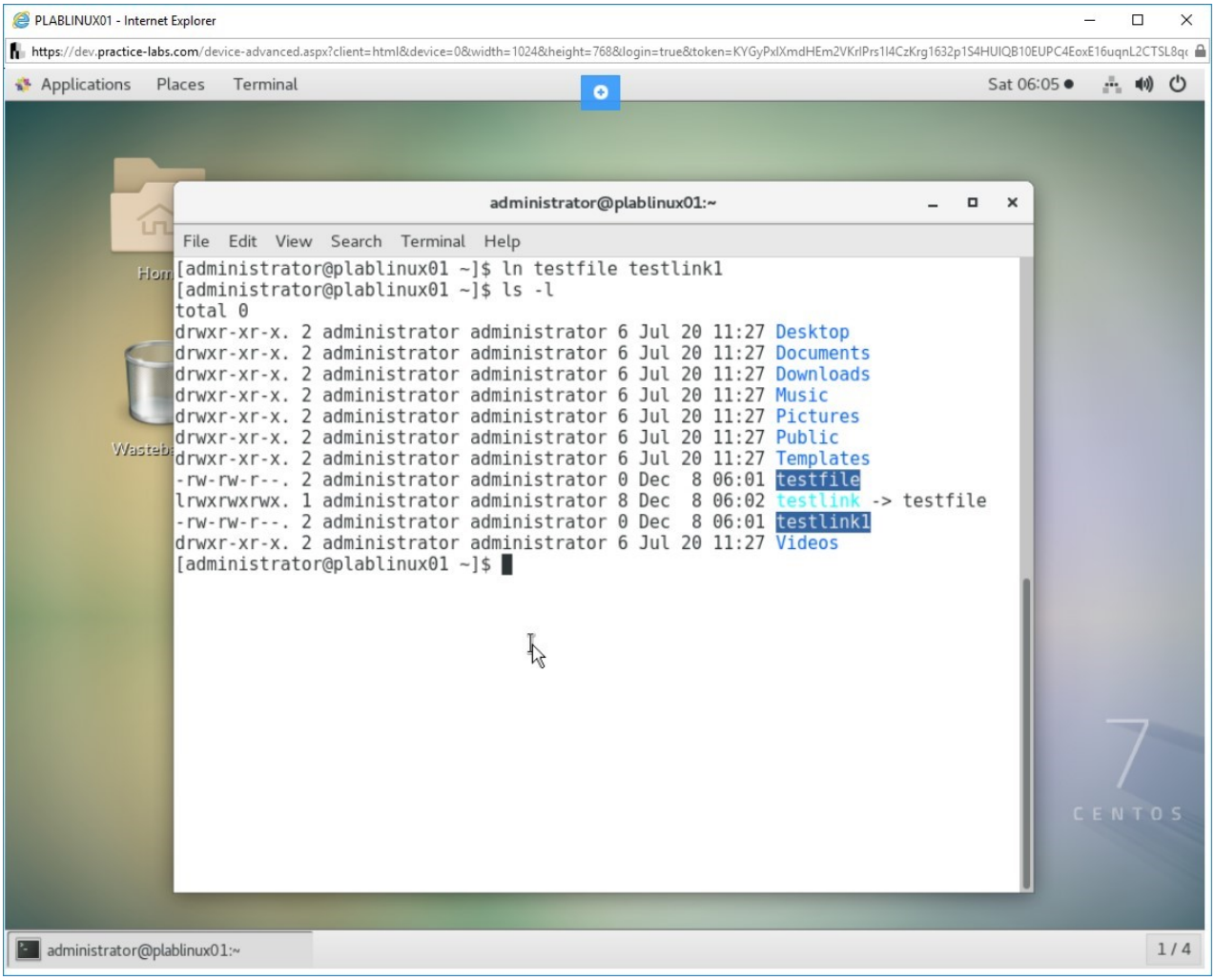


Figure 1.7 Screenshot of PLABLINUX01: Listing the directory contents using the ls -l command.

Task 2 - Use Links to Support System Administration Tasks

Symbolic links can be used for system administration tasks. For example, in this task, you will find a command file that has an alias and is stored and accessed from multiple locations. This task demonstrates only an example, but you can perform a number of tasks.

To use links to support system administration tasks, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Take the example of a command, **ls**. To locate the command, such as ls, type the following command:

```
which ls
```

Press **Enter**.

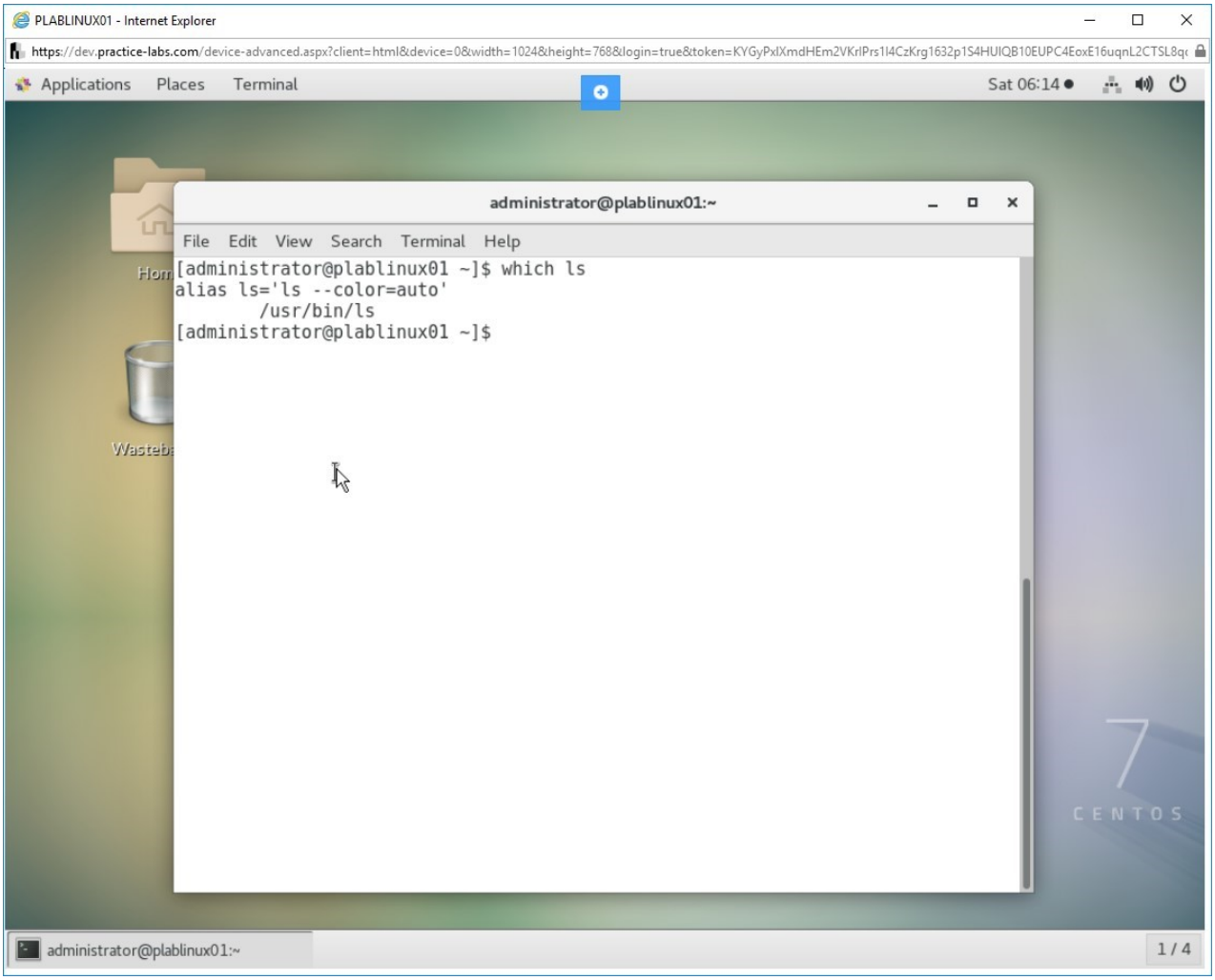


Figure 1.8 Screenshot of PLABLINUX01: Locating a command using the which command.

Step 2

Now, type the following command:

```
ls -l /usr/bin/ls
```

Press **Enter**.

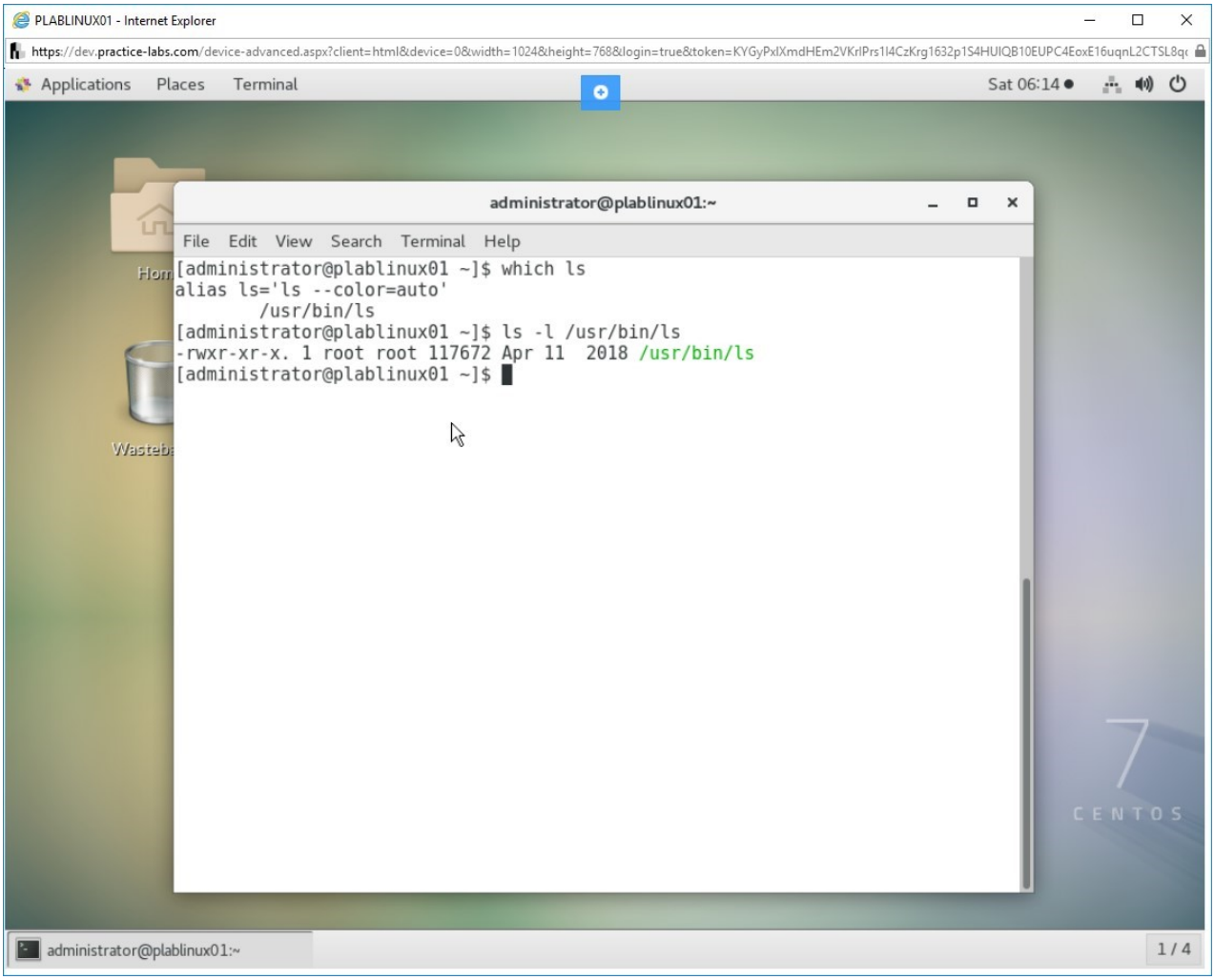


Figure 1.9 Screenshot of PLABLINUX01: Displaying the permissions on the ls command.

Step 3

Clear the screen by entering the following command:

```
clear
```

You can also check for the command alias. Type the following command:

```
ls -l $(which mkisofs)
```

Press **Enter**.

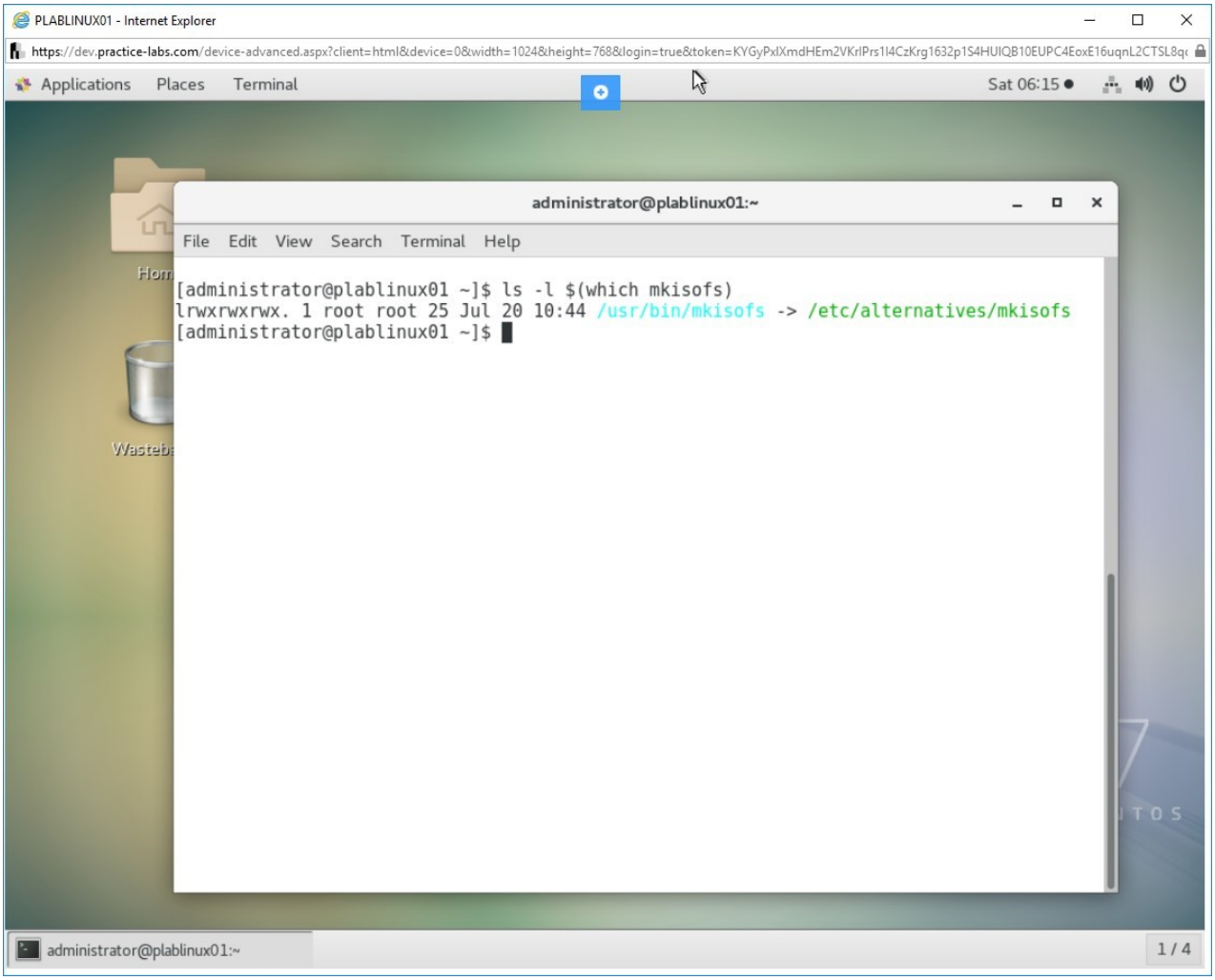


Figure 1.10 Screenshot of PLABLINUX01: Checking for the command alias.

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

Review

Well done, you have completed the **Amending Hard and Symbolic Links** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Create and Change Hard and Symbolic Links

You should now be able to:

- Manage hard and/or symbolic links

- Use links to support system administrative tasks

Feedback

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