

Performing Basic File Management

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Introduction

Welcome to the **Performing Basic File Management** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

File Management

Tar Command

Cpio Command

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Perform Basic File Management

After completing this lab, you will be able to:

- Perform basic file management
- Use wildcards for advanced file operations
- Use wildcards to manipulate data in a file
- Use the find command
- Use the tar and cpio commands

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI: 103.2 Process text streams using filters**

- **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

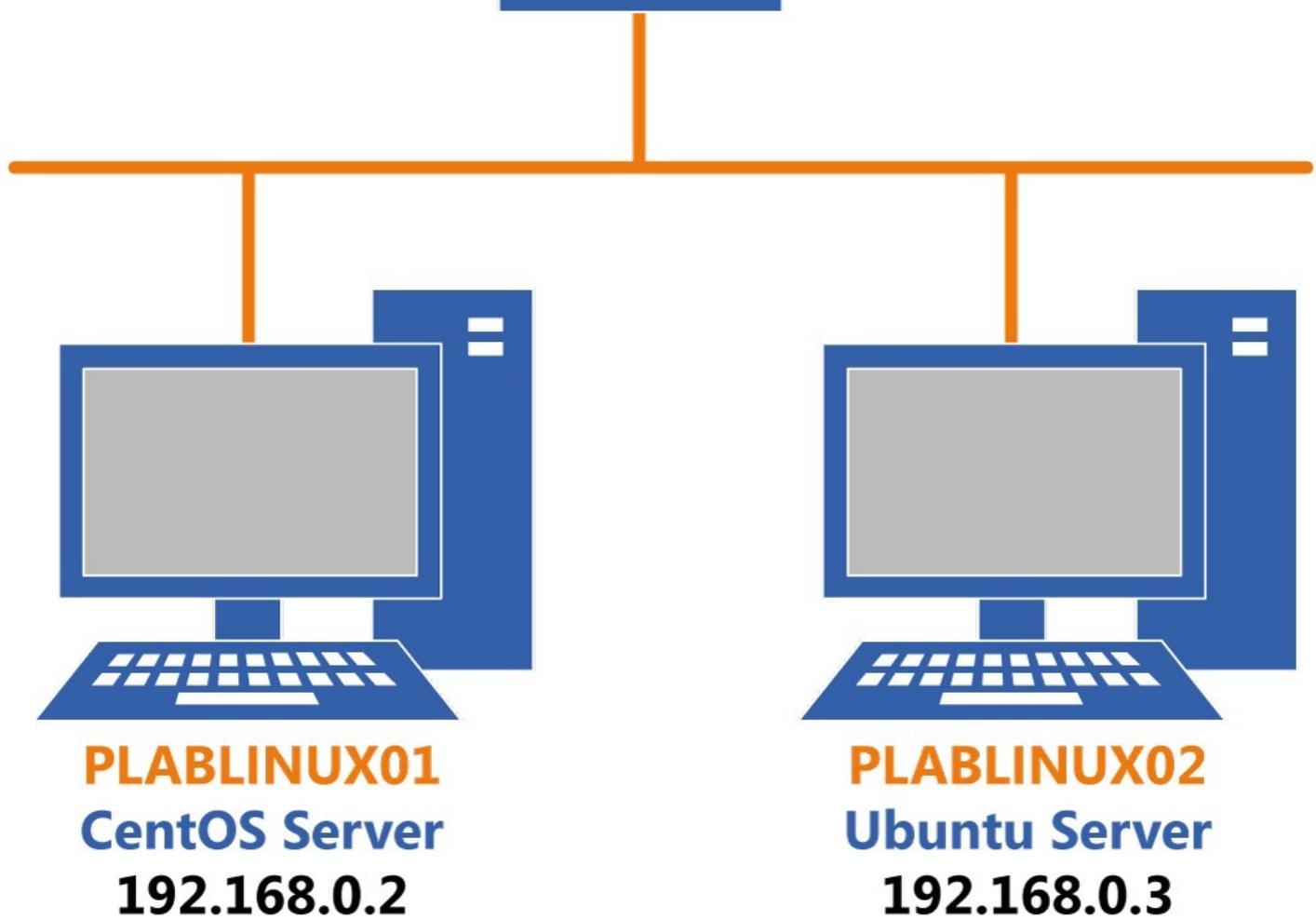
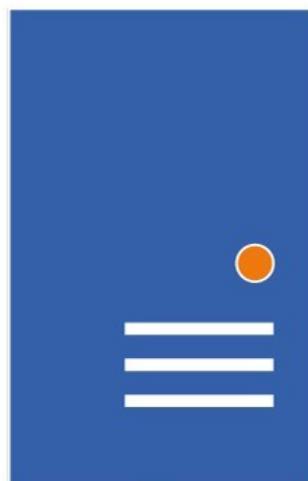
For more information on using Practice Labs, please see our **Help and Support** page. You can also raise a technical support ticket from this page.

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.

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 - Perform Basic File Management

File management is one of the basic tasks to perform while using computers. Linux offers many commands to perform these operations. In this exercise, you will become familiar with these commands.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Perform basic file management
- Use wildcards for advanced file operations
- Use wildcards to manipulate data in a file
- Use the find command
- Use the tar and cpio commands

Your Devices

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

- **PLABLINUX01** (CentOS Server)



Task 1 - Perform Basic File Management

File management includes operations such as creating, saving, listing, copying, moving, and many other operations on files. In this task, you will use various commands to perform all these operations on a Fedora Linux system.

To perform basic file operations on a Fedora Linux system, perform the following steps:

Step 1

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

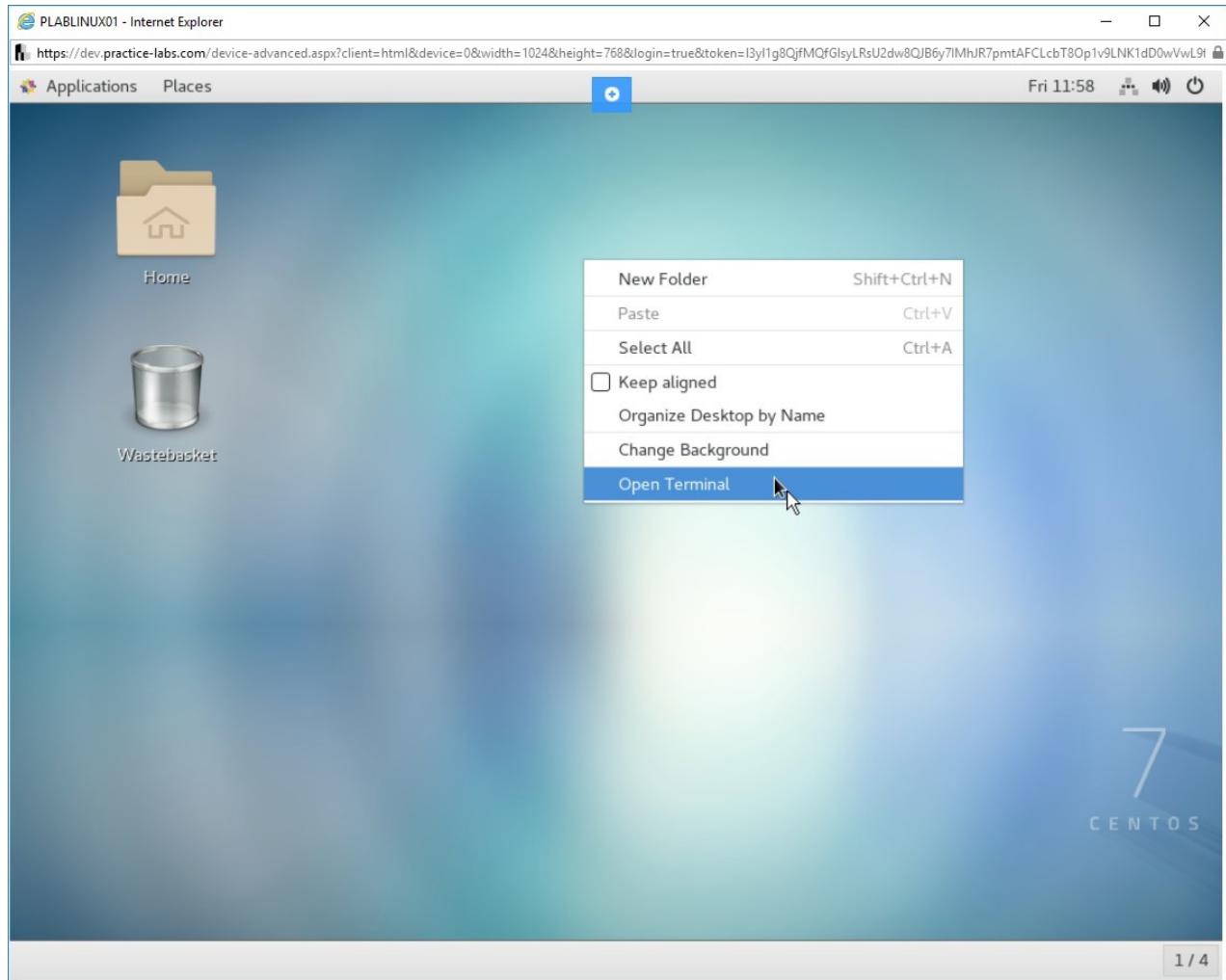


Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

The terminal window is displayed. You need to create a text file. To do this, type the following command:

```
touch test.txt
```

Press **Enter**.

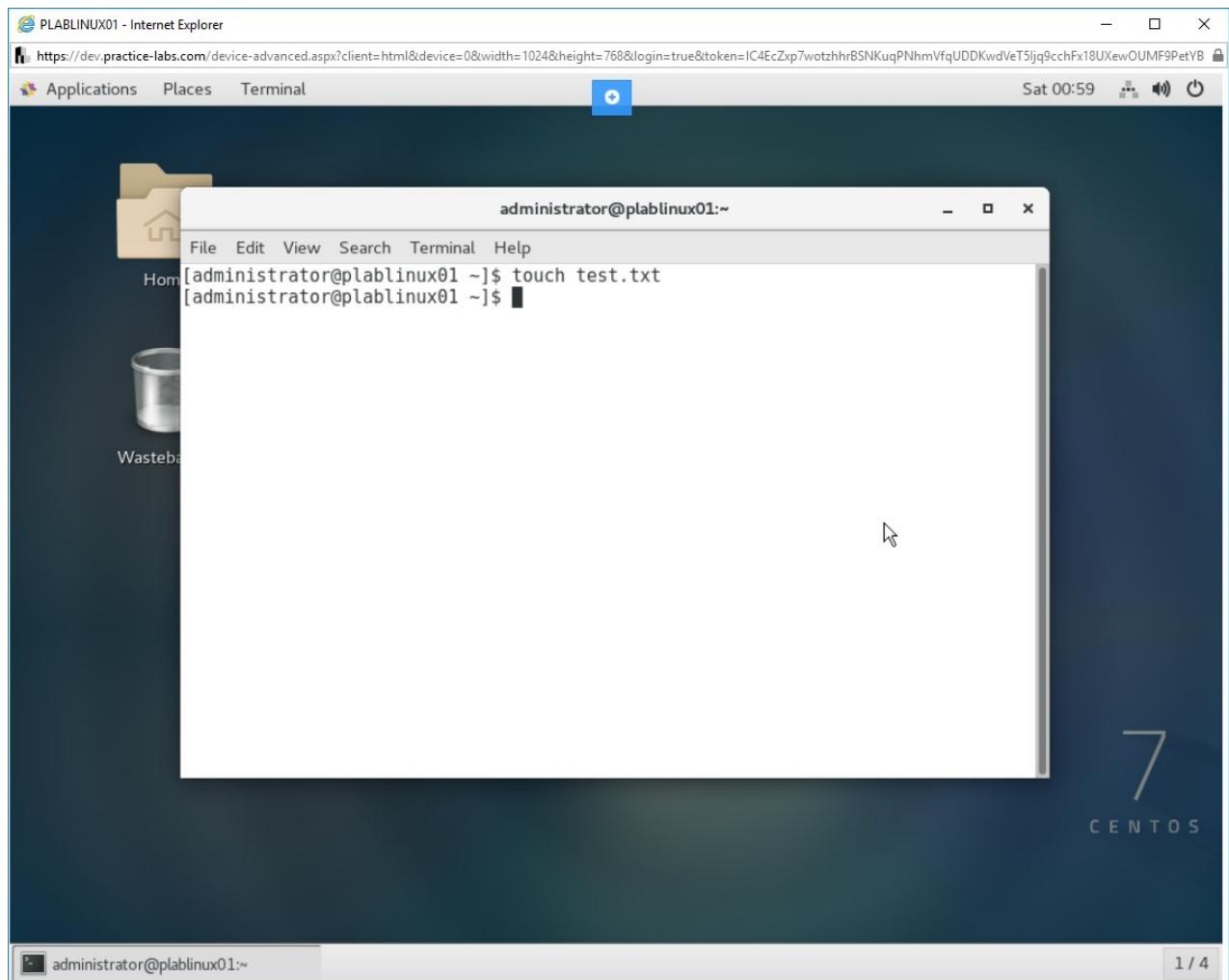


Figure 1.2 Screenshot of PLABLINUX01: Displaying the creation of a text file.

Step 3

To copy the **test.txt** file as **new.txt**, type the following command:

```
cp test.txt new.txt
```

Press **Enter**.

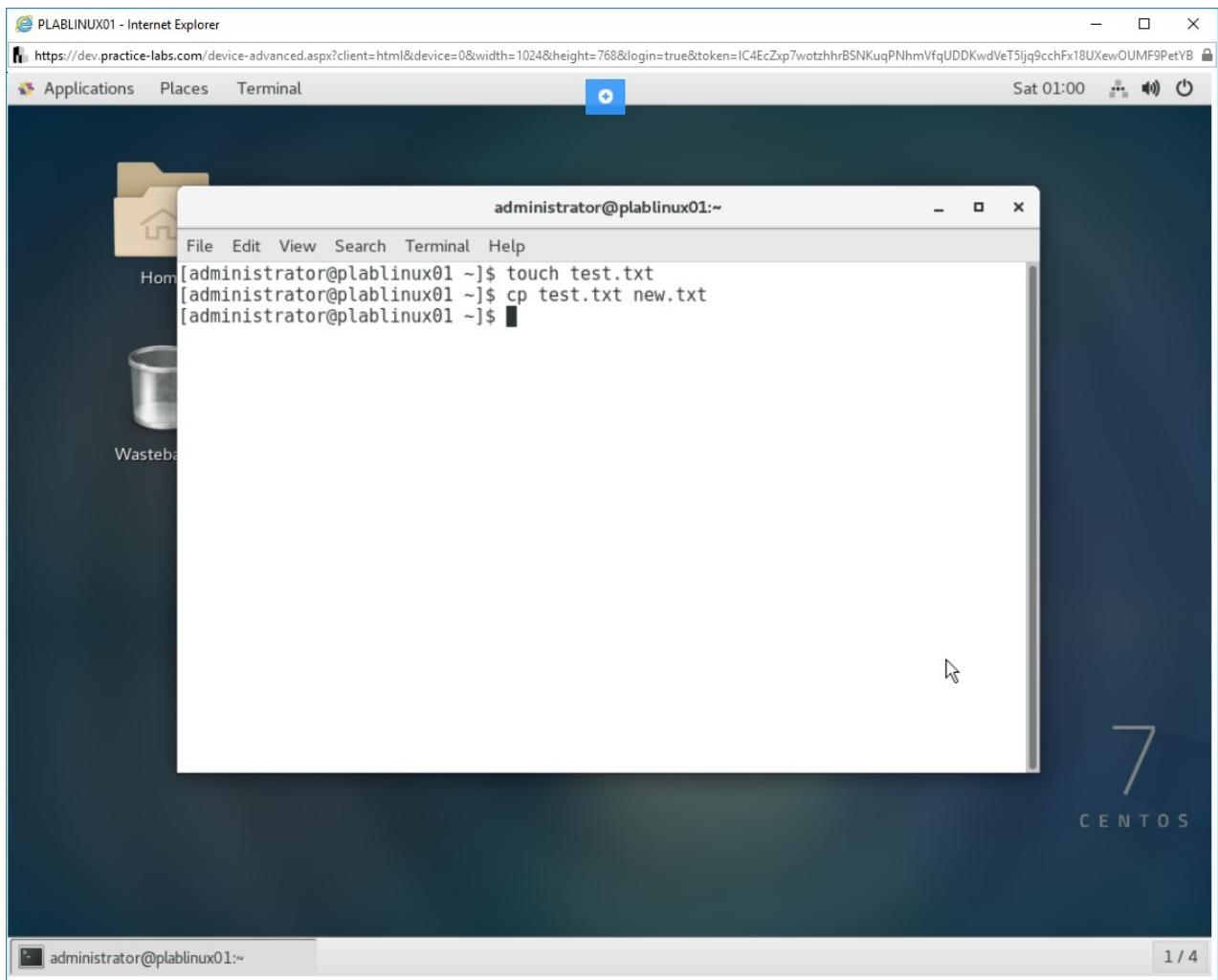


Figure 1.3 Screenshot of PLABLINUX01: Displaying the output of the cp command to copy a file into another file.

Step 4

To list the directory contents to verify that the file is now copied, type the following command:

```
ls
```

Press **Enter**.

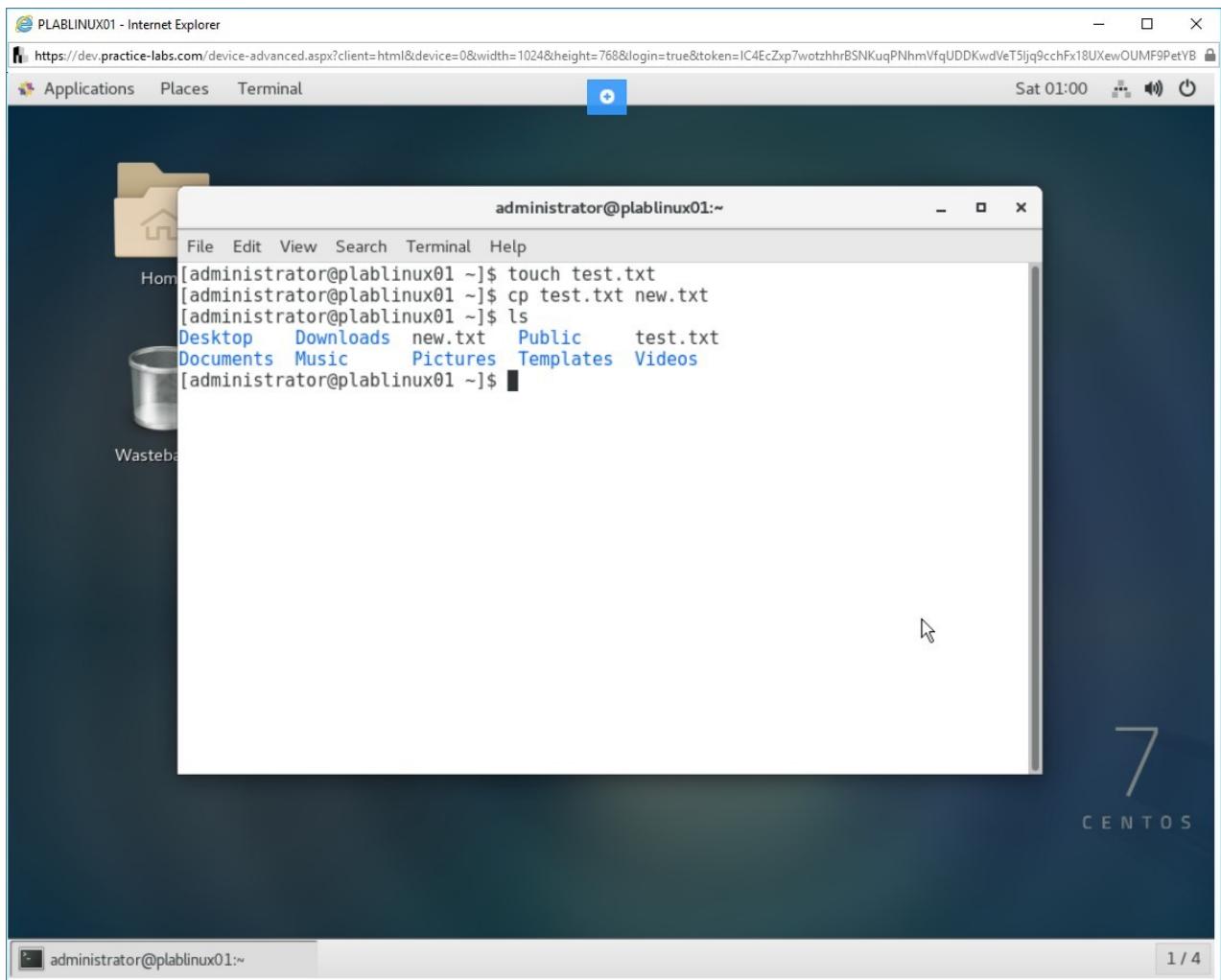


Figure 1.4 Screenshot of PLABLINUX01: Listing the contents of a directory.

Step 5

Clear the screen by entering the following command:

```
clear
```

You can also move files from one directory to another directory. You can use the mv command to perform such tasks. For example, to move **new.txt** to **Downloads** directory, type the following command:

```
mv new.txt Downloads
```

Press **Enter**.

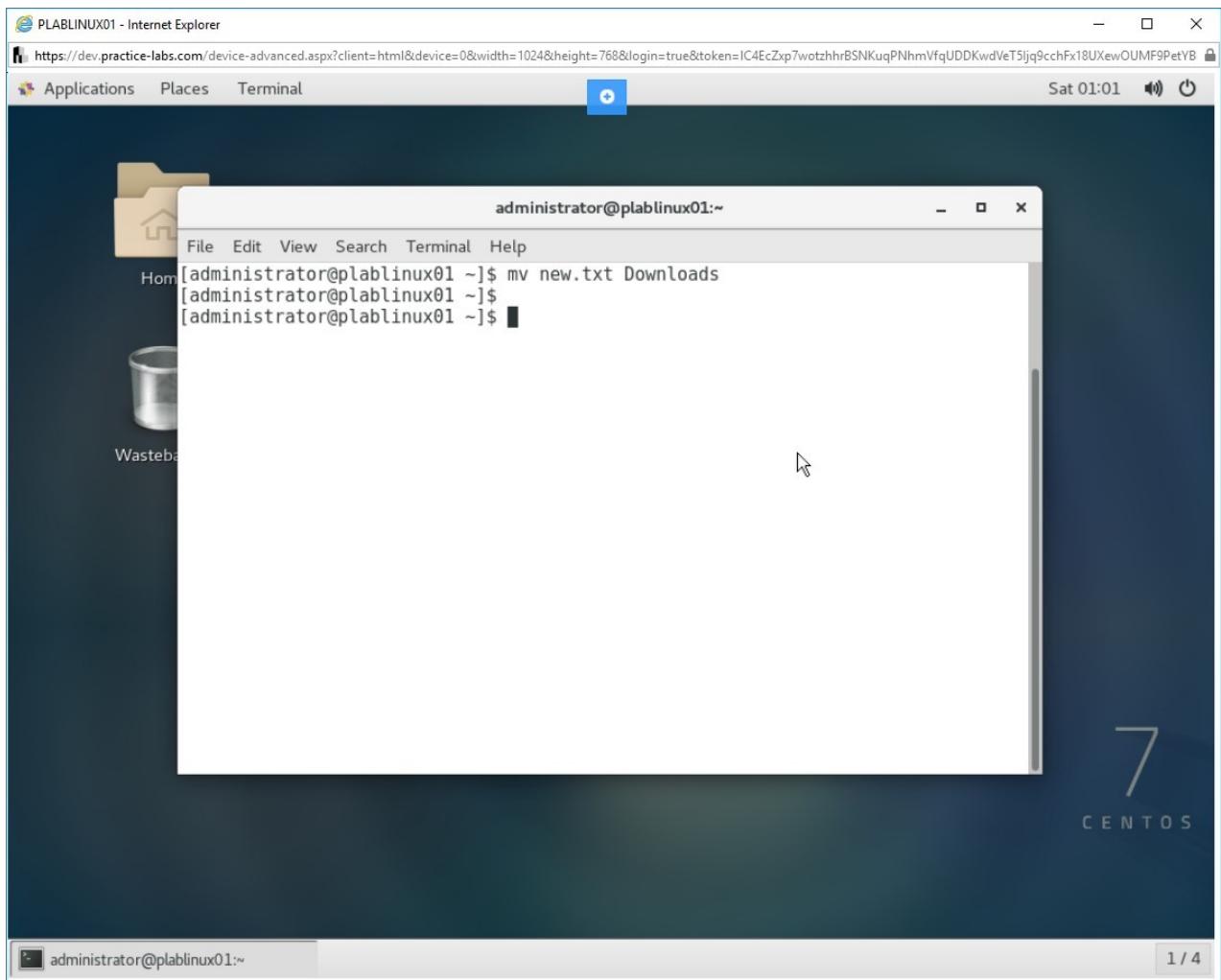


Figure 1.5 Screenshot of PLABLINUX01: Moving the file to the Downloads directory.

Step 6

Check the directory where **new.txt** file was created. The file should not be present in this directory. Type the following command:

```
ls
```

Press **Enter**.

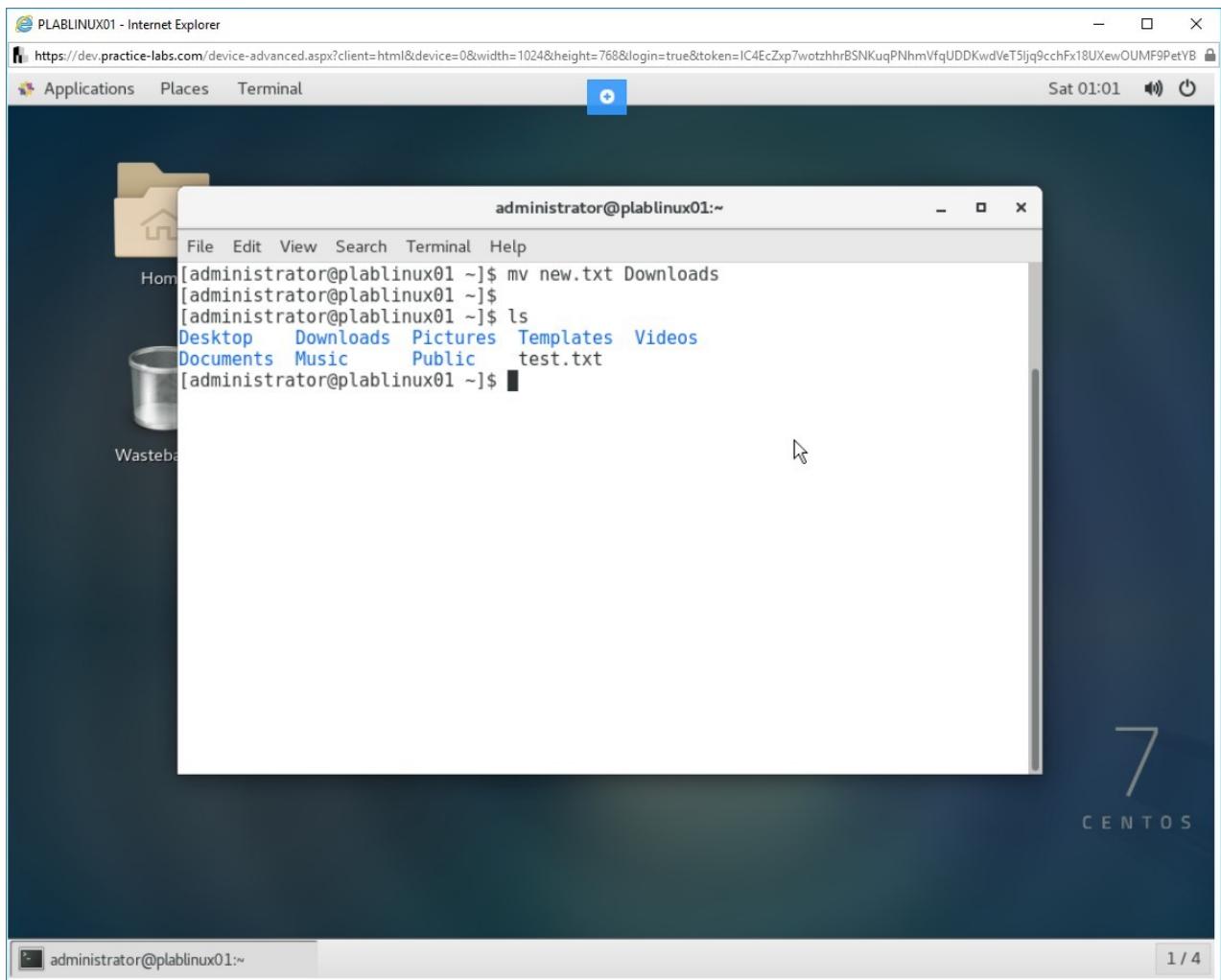


Figure 1.6 Screenshot of PLABLINUX01: Listing the contents of a directory.

Step 7

To view the contents of the **Downloads** directory, type the following command:

```
ls Downloads
```

Press **Enter**.

Notice that **new.txt** is now present in the **Downloads** directory.

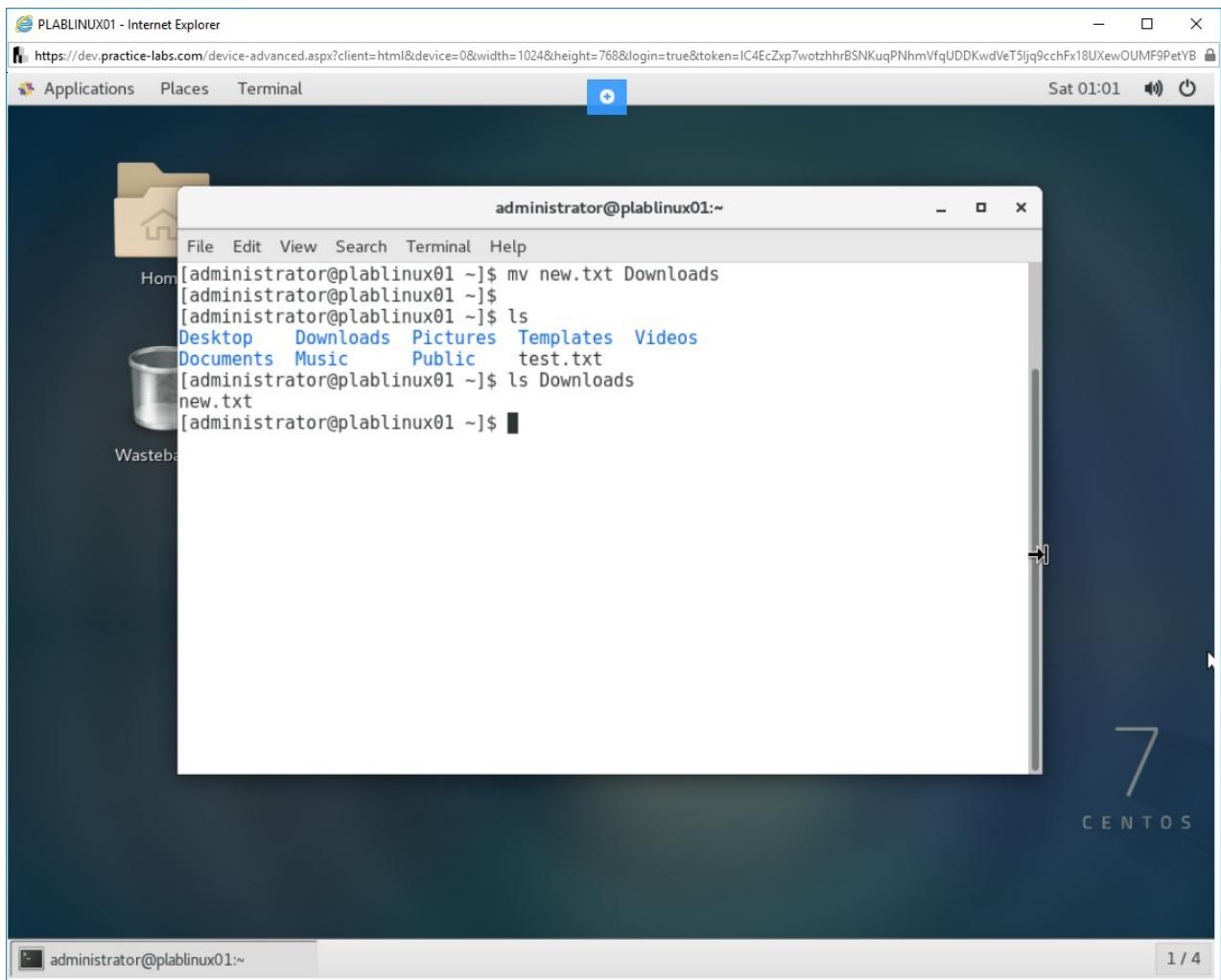


Figure 1.7 Screenshot of PLABLINUX01: Listing the contents of the Downloads directory.

Step 8

To remove a file, you can use the **rm** command. For example, to remove the **test.txt** file, type the following command:

```
rm test.txt
```

Press **Enter**.

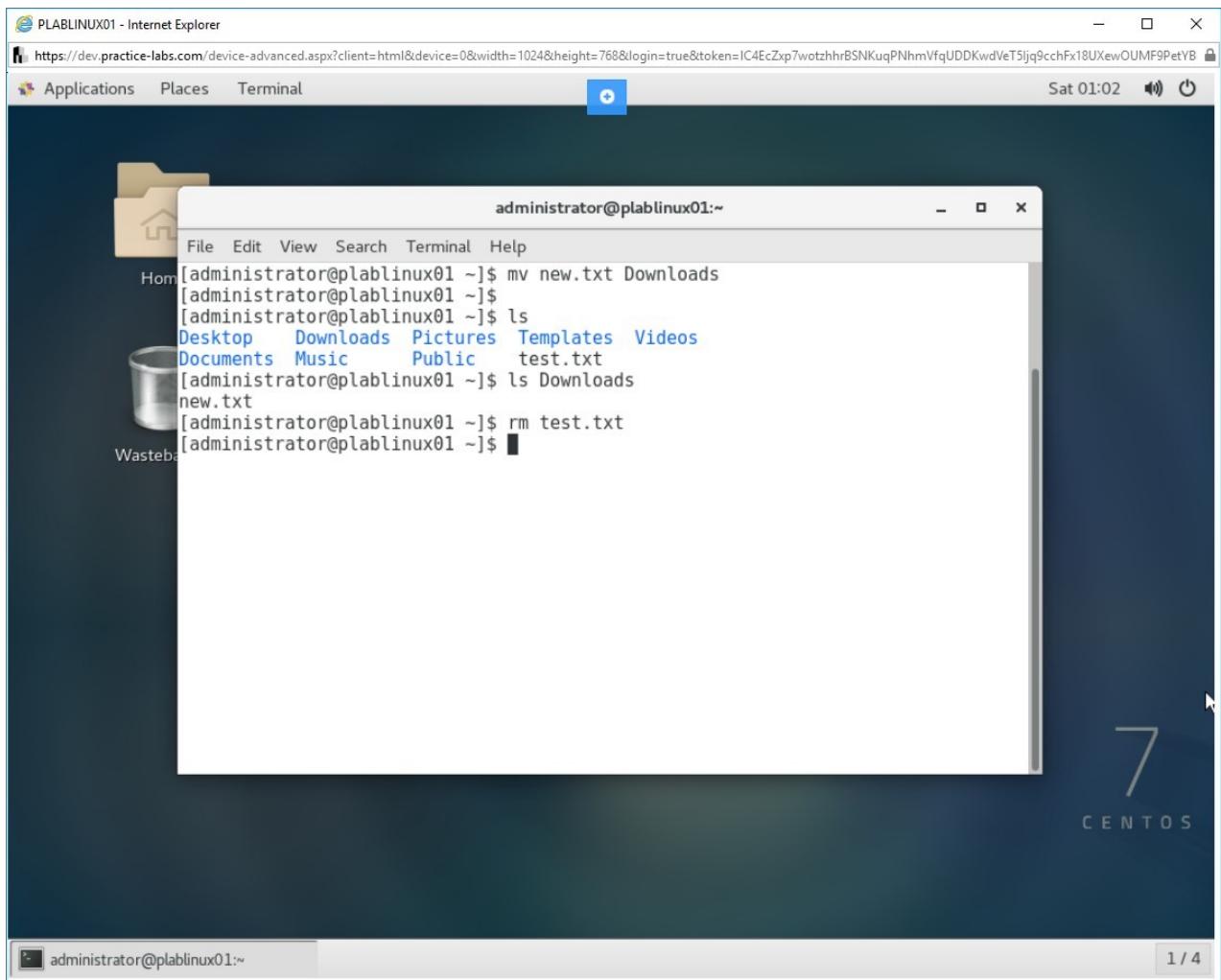


Figure 1.8 Screenshot of PLABLINUX01: Removing a file using the rm command.

Step 9

To view the contents of the directory, type the following command:

```
ls
```

Notice that the file is now removed.

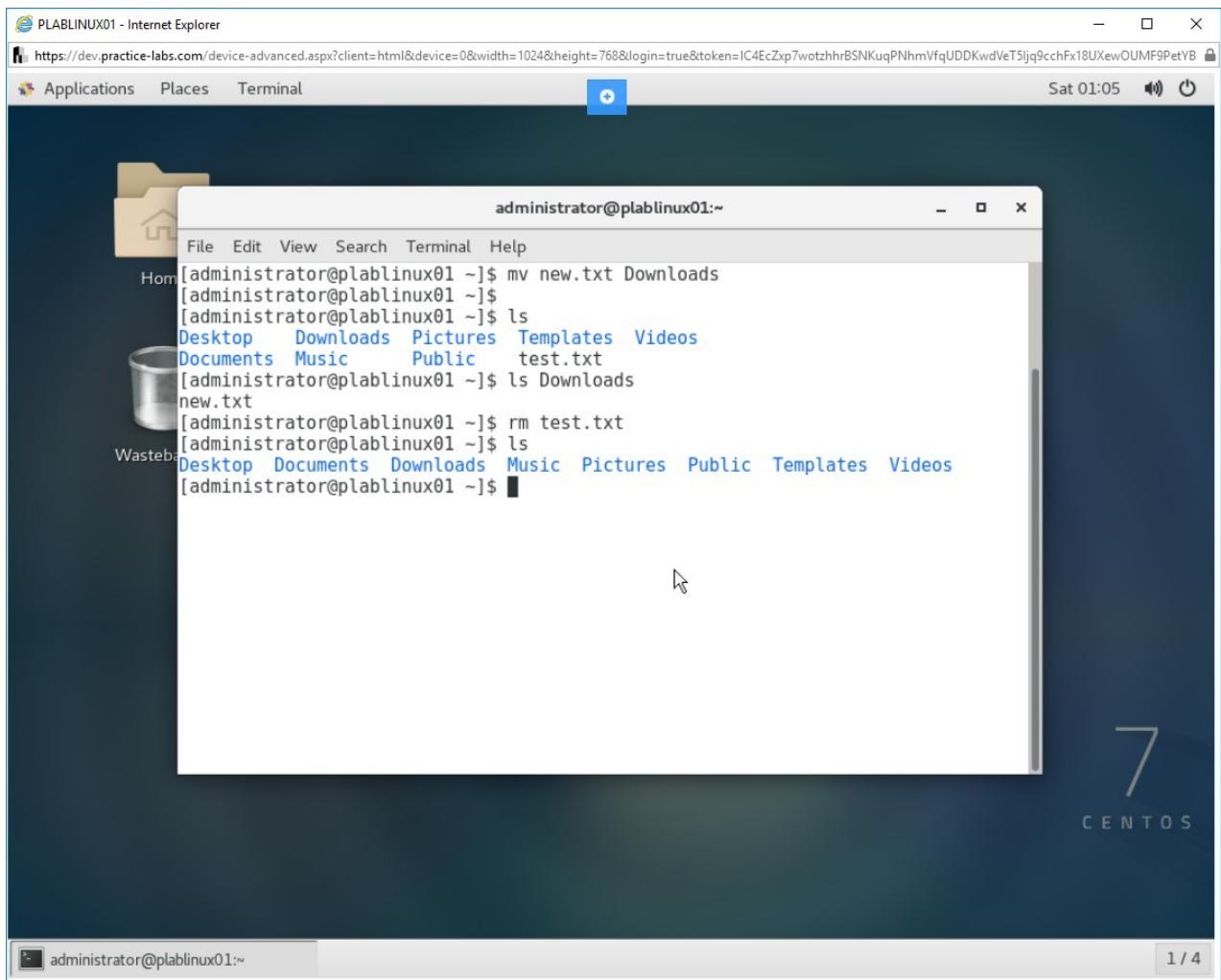


Figure 1.9 Screenshot of PLABLINUX01: Listing the contents of a directory.

Step 10

Clear the screen using the **clear** command.

To create a new directory, type the following command:

```
mkdir myfolder
```

Press **Enter**.

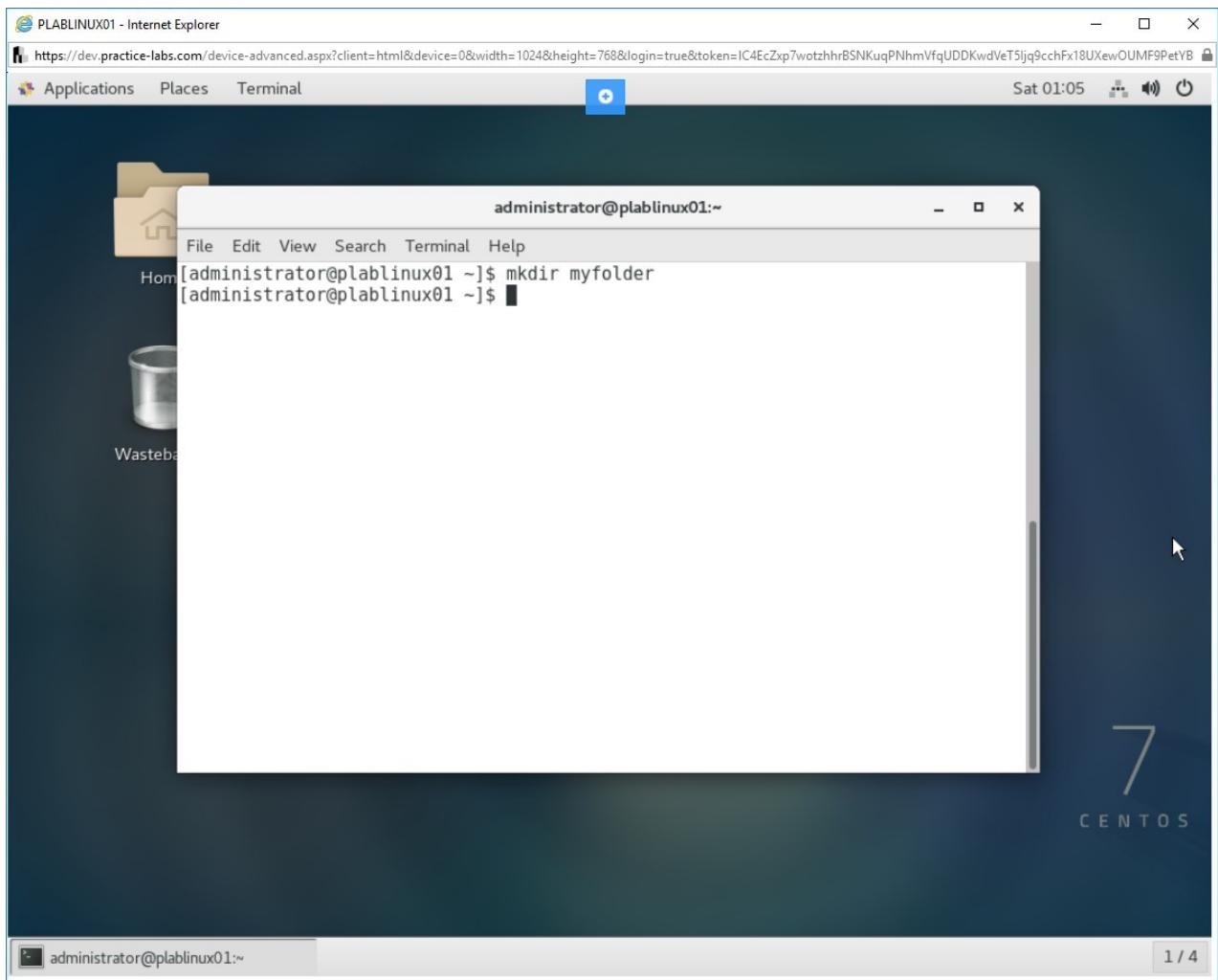


Figure 1.10 Screenshot of PLABLINUX01: Creating a new directory with the `mkdir` command.

Step 11

To view the contents of the directory, type the following command:

```
ls
```

Notice the directory has been created.

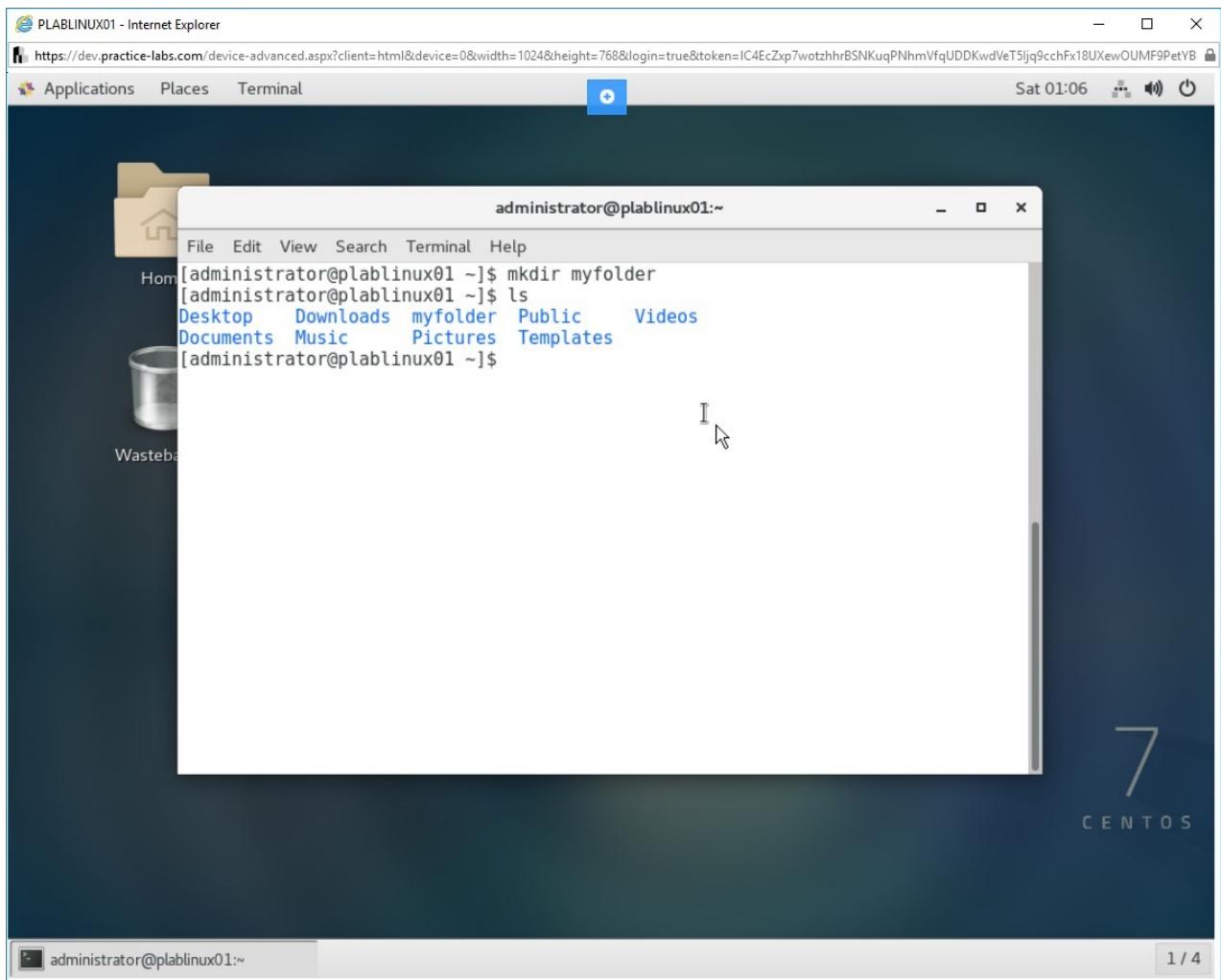


Figure 1.11 Screenshot of PLABLINUX01: Listing the contents of a directory.

Step 12

To create a subdirectory within a directory, type the following command:

```
mkdir myfolder/mydocs
```

Press **Enter**.

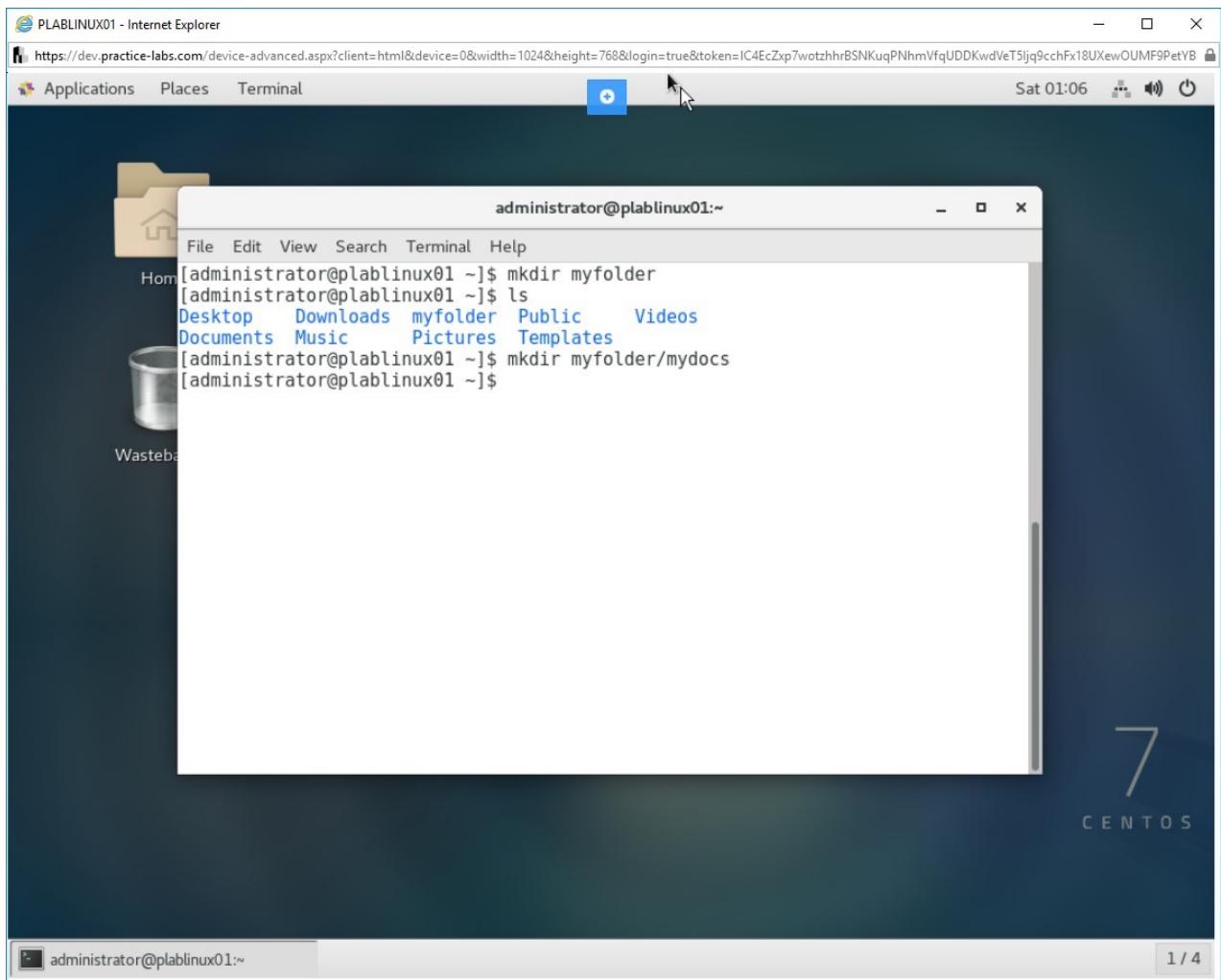


Figure 1.12 Screenshot of PLABLINUX01: Creating a subdirectory with the `mkdir` command.

Step 13

To verify that the directory and its subdirectory is created, type the following command:

```
ls myfolder/
```

Press **Enter**.

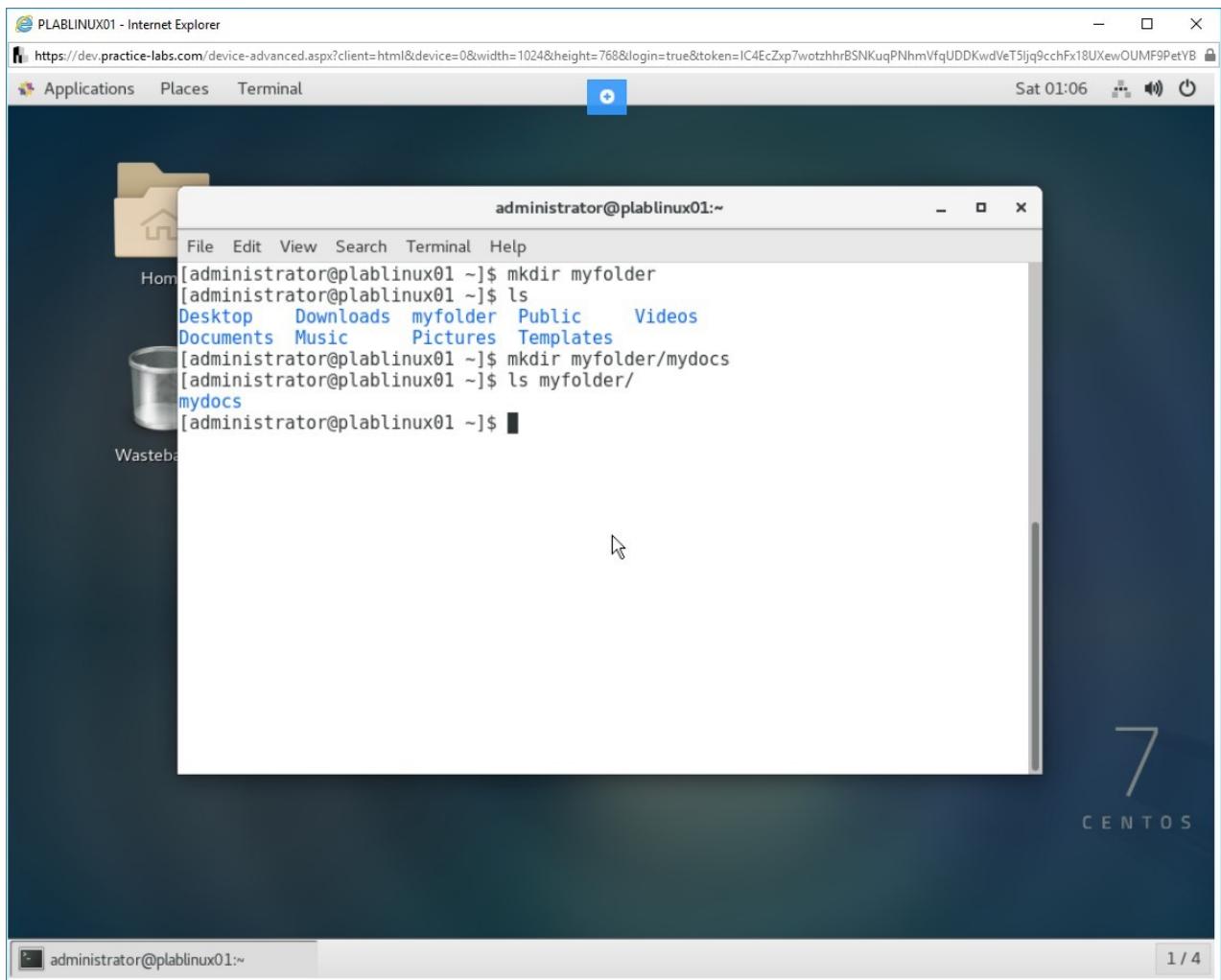


Figure 1.13 Screenshot of PLABLINUX01: Listing the contents of the myfolder directory.

Step 14

To move a directory from one directory to another directory, type the following command:

```
mv myfolder/mydocs Downloads
```

Press **Enter**.

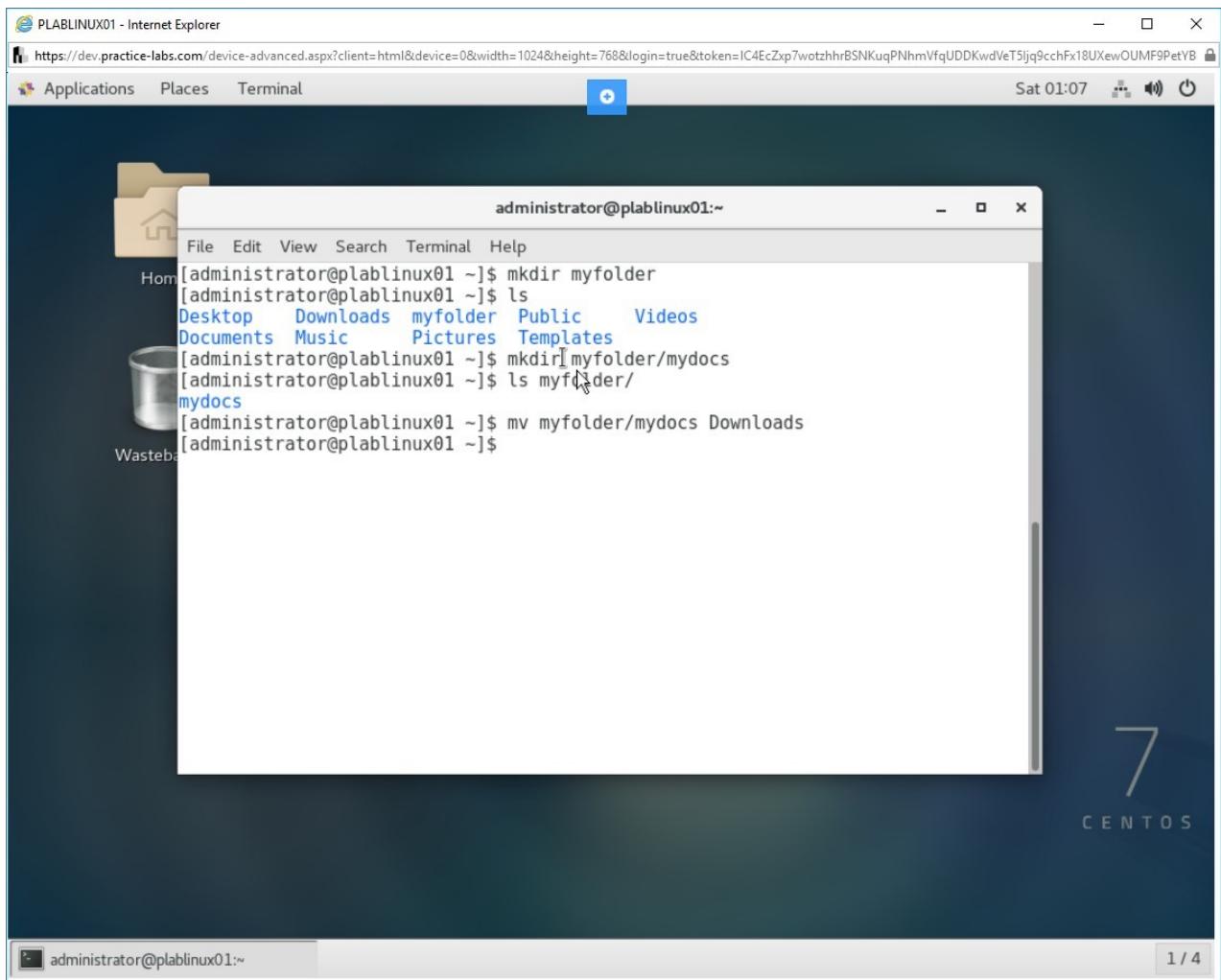


Figure 1.14 Screenshot of PLABLINUX01: Moving the myfolder/mydocs subdirectory to the Downloads directory.

Step 15

To list the contents of the **Downloads** directory, type the following command:

```
ls Downloads/
```

Press **Enter**.

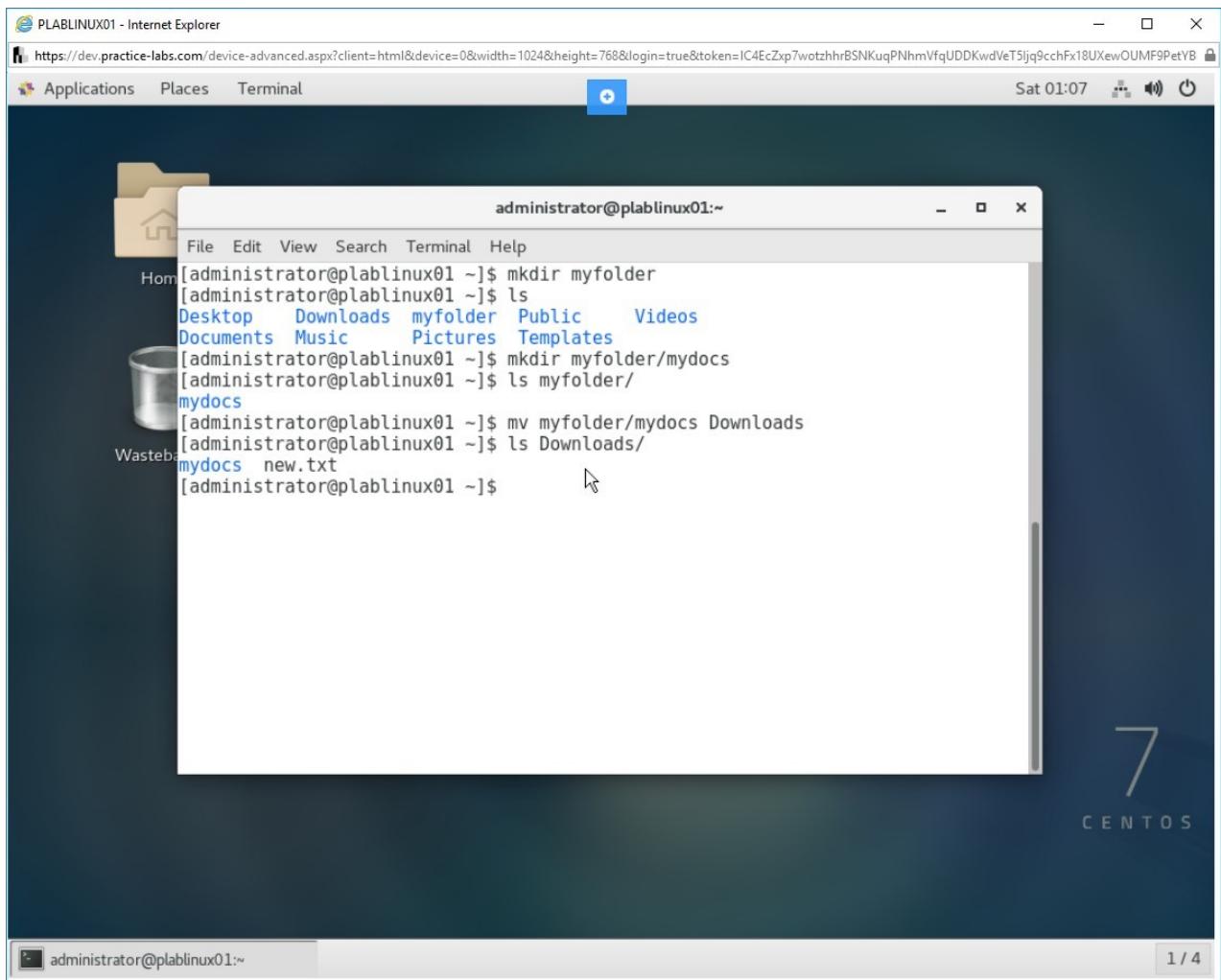


Figure 1.15 Screenshot of PLABLINUX01: Listing the contents of the Downloads directory.

Step 16

To remove a directory, type the following command:

```
rm myfolder
```

Press **Enter**.

You are flagged that this is a directory.

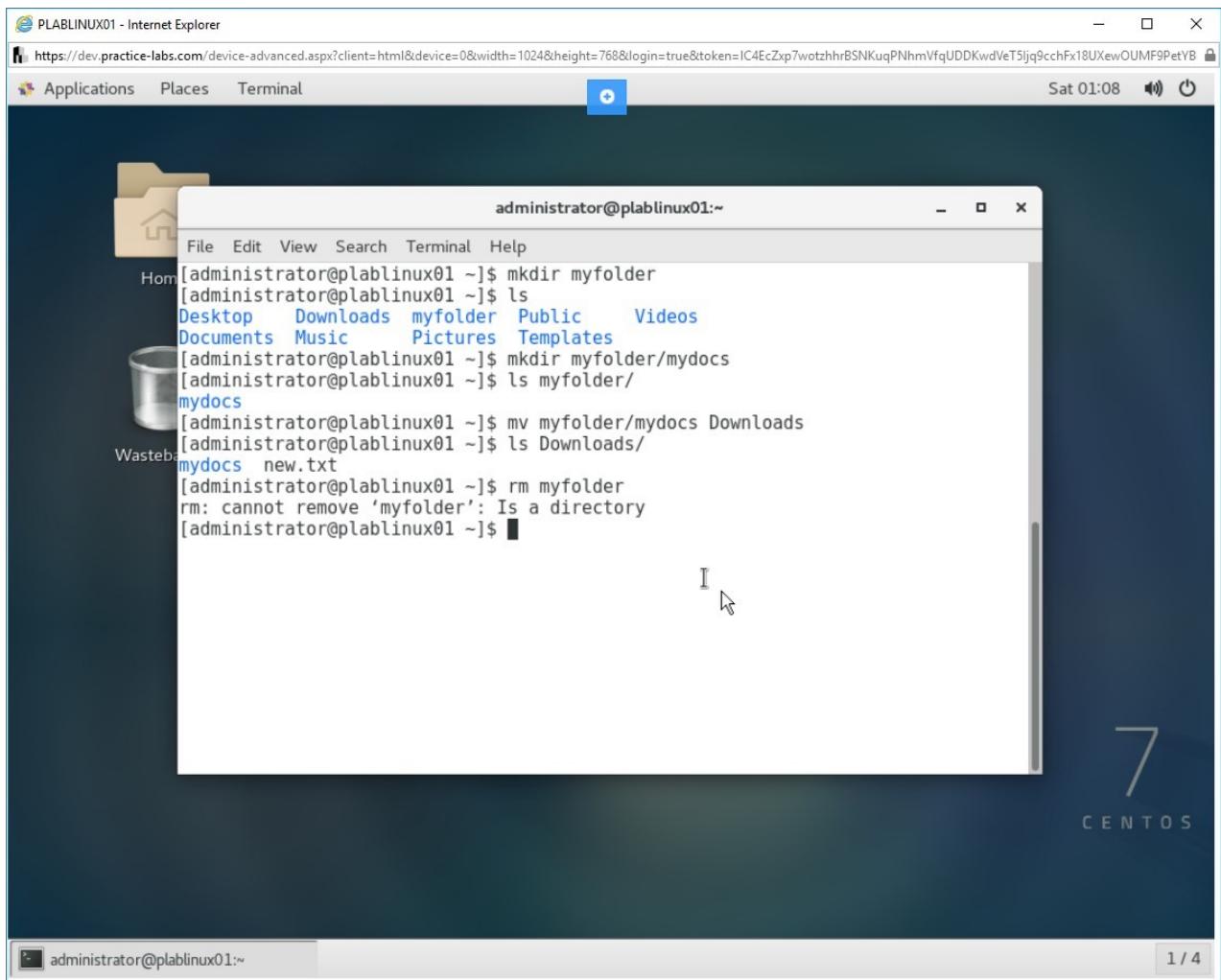


Figure 1.16 Screenshot of PLABLINUX01: Moving the myfolder directory.

Step 17

Clear the screen by entering the following command:

```
clear
```

Note: To remove the directory, enter the same command with the -r switch. You can use the following command: rm -r myfolder.

However, for this task, you should not delete this folder.

Step 18

Clear the screen by entering the following command:

```
clear
```

Before proceeding to the next step, move the **mydocs** directory back to the **myfolder** directory. Type the following command:

```
mv Downloads/mydocs myfolder
```

Press **Enter**.

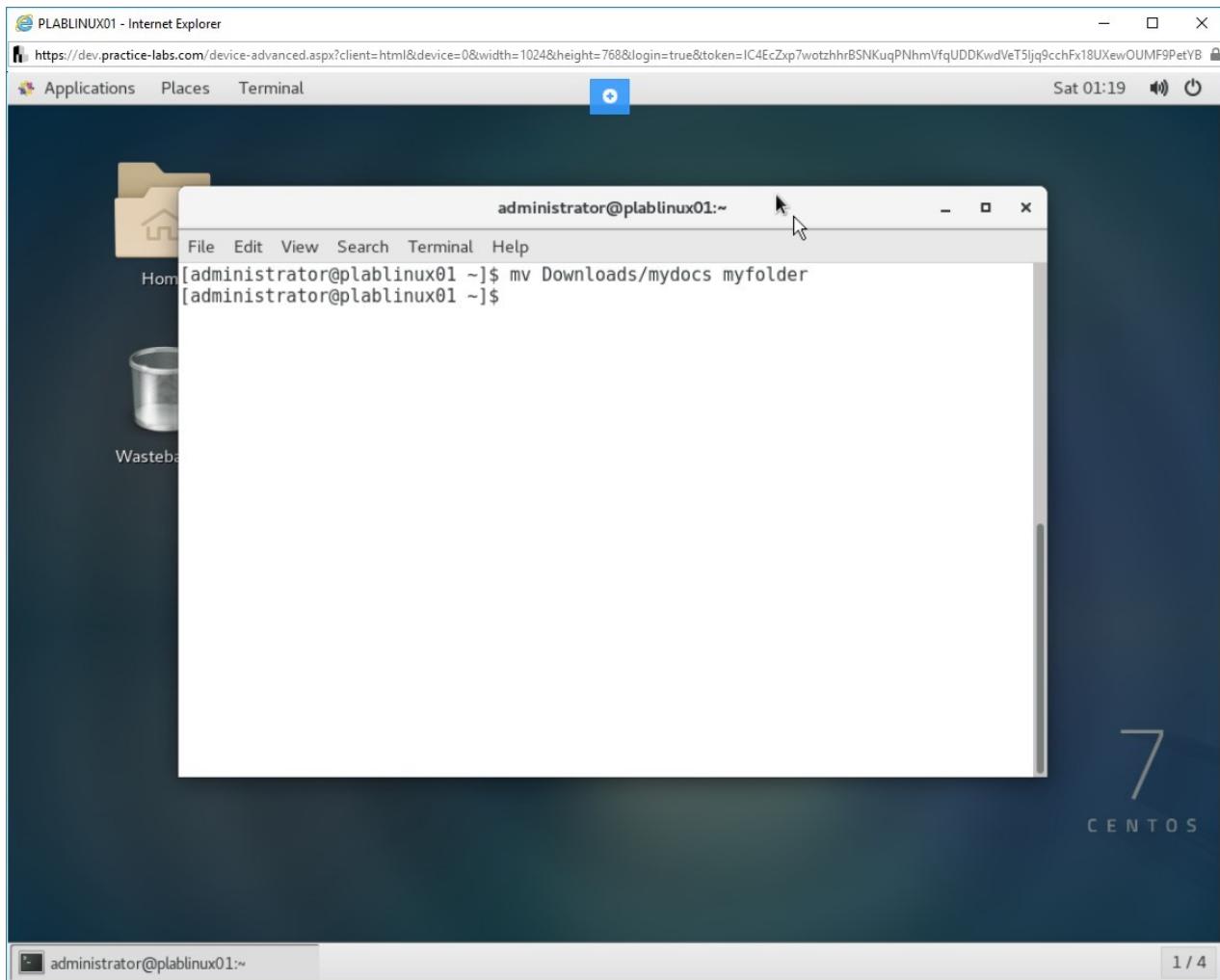


Figure 1.17 Screenshot of PLABLINUX01: Moving the Download/mydocs subdirectory to the myfolder directory.

Step 19

You can also use the **rmdir** command to delete a directory. For example, to delete **mydocs** from **myfolder**, enter the following command:

```
rmdir myfolder/mydocs
```

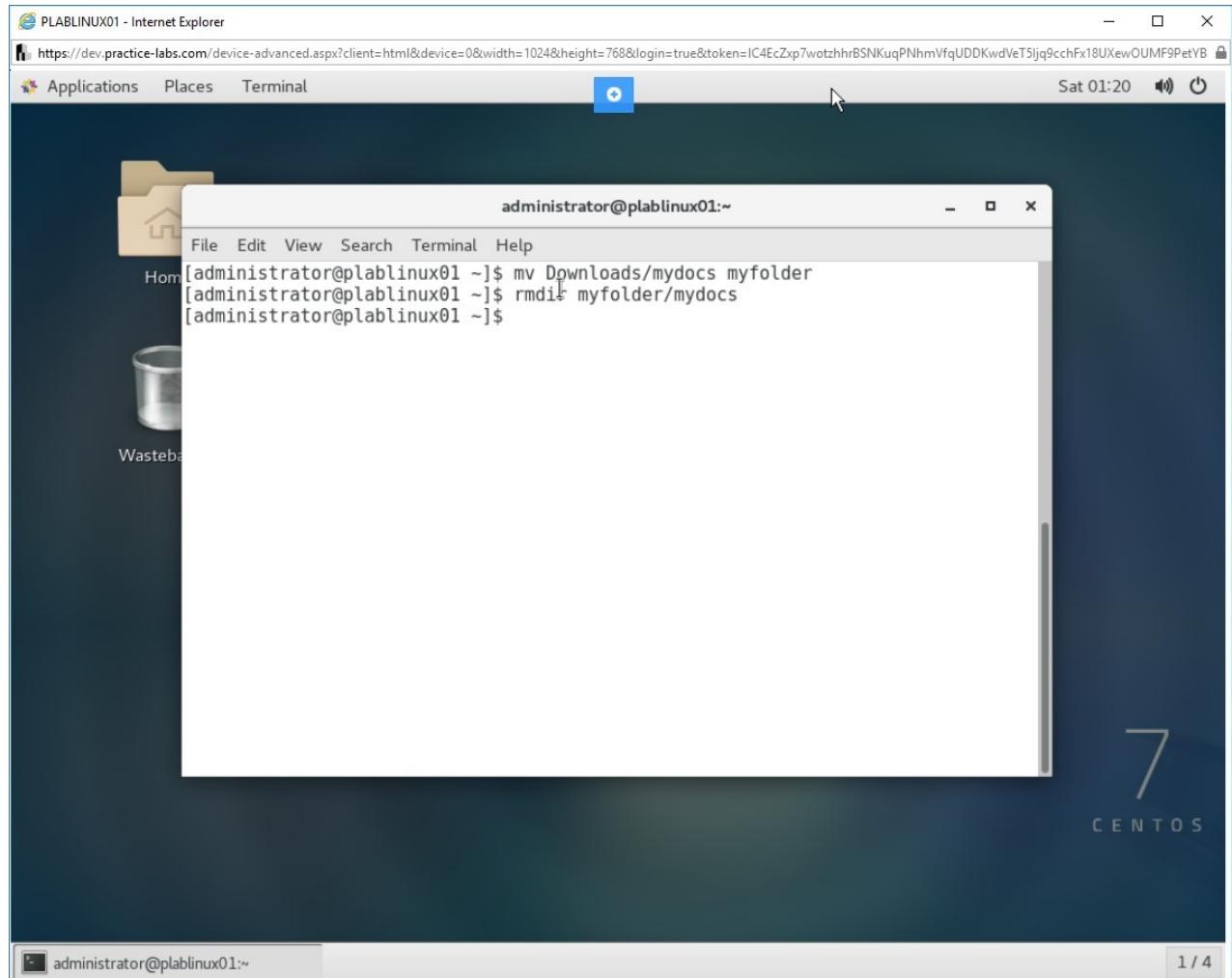


Figure 1.18 Screenshot of PLABLINUX01: Removing the myfolder/mydocs subdirectory.

Step 20

Type the following command to verify that the directory is now removed:

```
ls myfolder/
```

Press **Enter**.

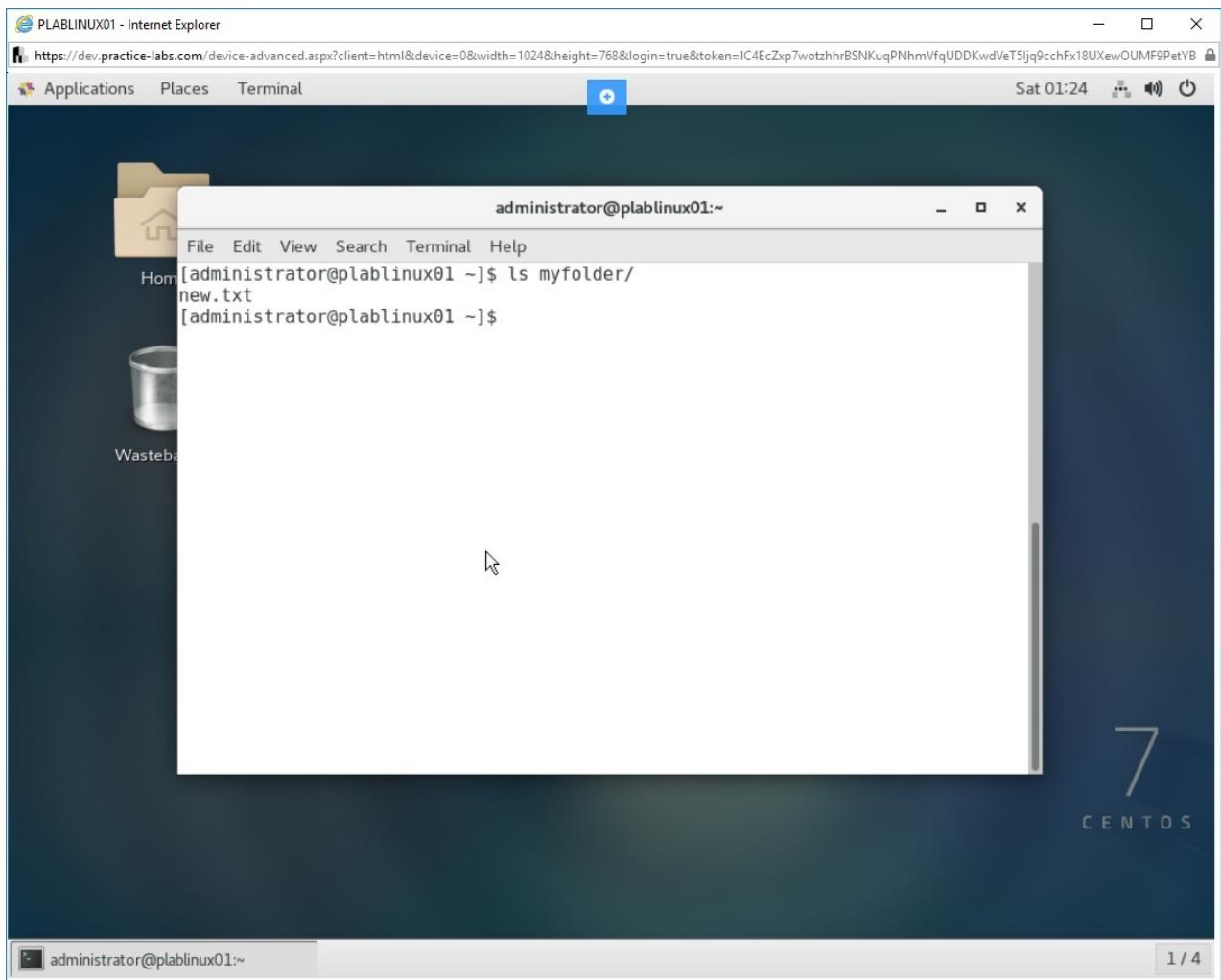


Figure 1.19 Screenshot of PLABLINUX01: Listing the contents of the myfolder directory.

Task 2 - Use Wildcards for Advanced File Operations

Linux uses many special characters, known as wildcards that help perform advanced file operations. Examples of such wildcards include special characters such as “*”, “?”, “[]”, “~”, and many more. Advanced file operations can be copying a directory and the contained files, removing a directory and the contained files, and other such operations. Normally, these operations would need recursive commands, using the wildcards, you can perform these operations with a single command.

To use simple and advanced wildcards in commands, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

To create a directory named test, type the following command:

```
mkdir test
```

Press **Enter**.

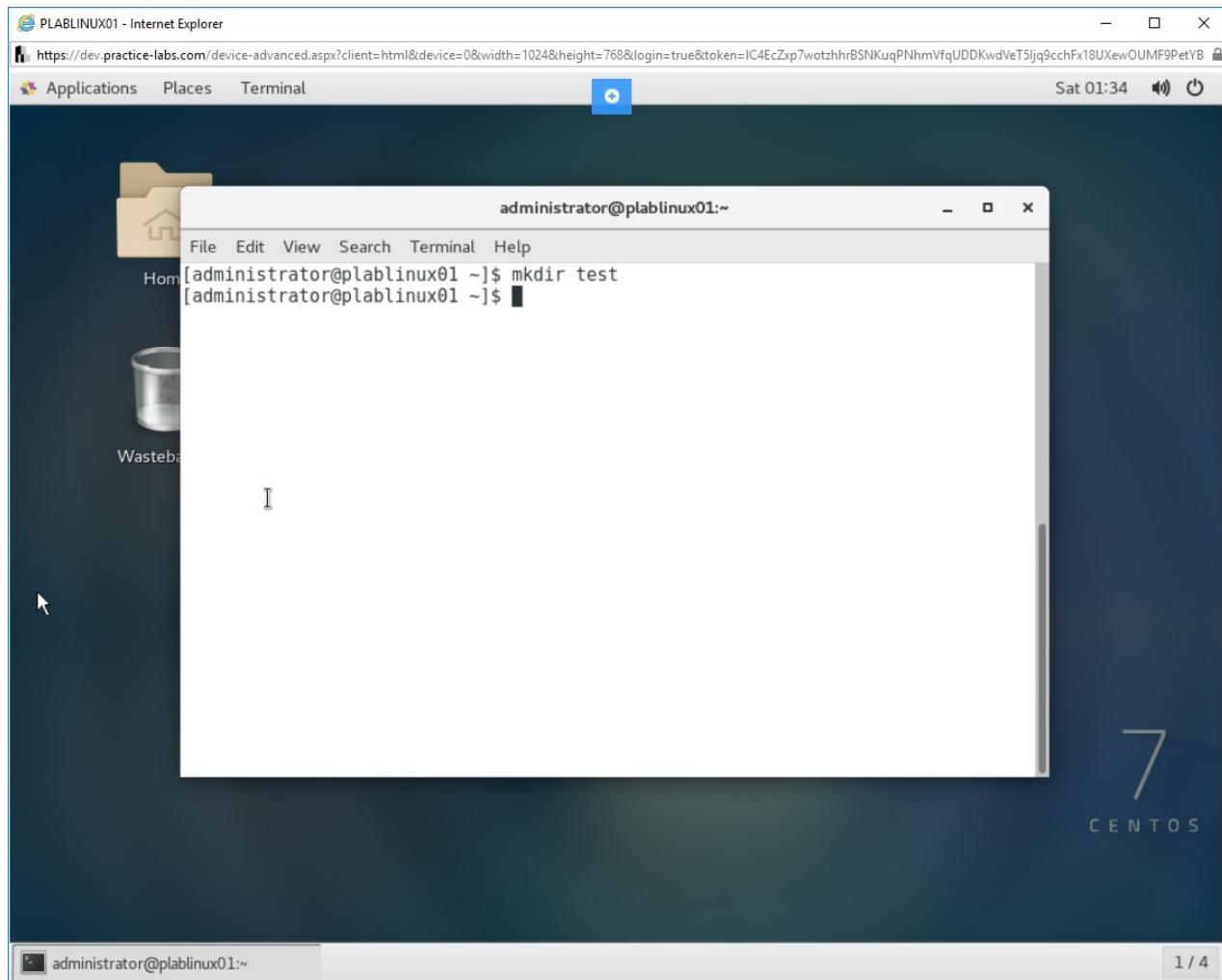


Figure 1.20 Screenshot of PLABLINUX01: Creating a new directory named test.

Step 2

Create two files with the names **1.txt** and **2.txt**. Type the following commands:

```
touch 1.txt  
touch 2.txt
```

Press **Enter**.

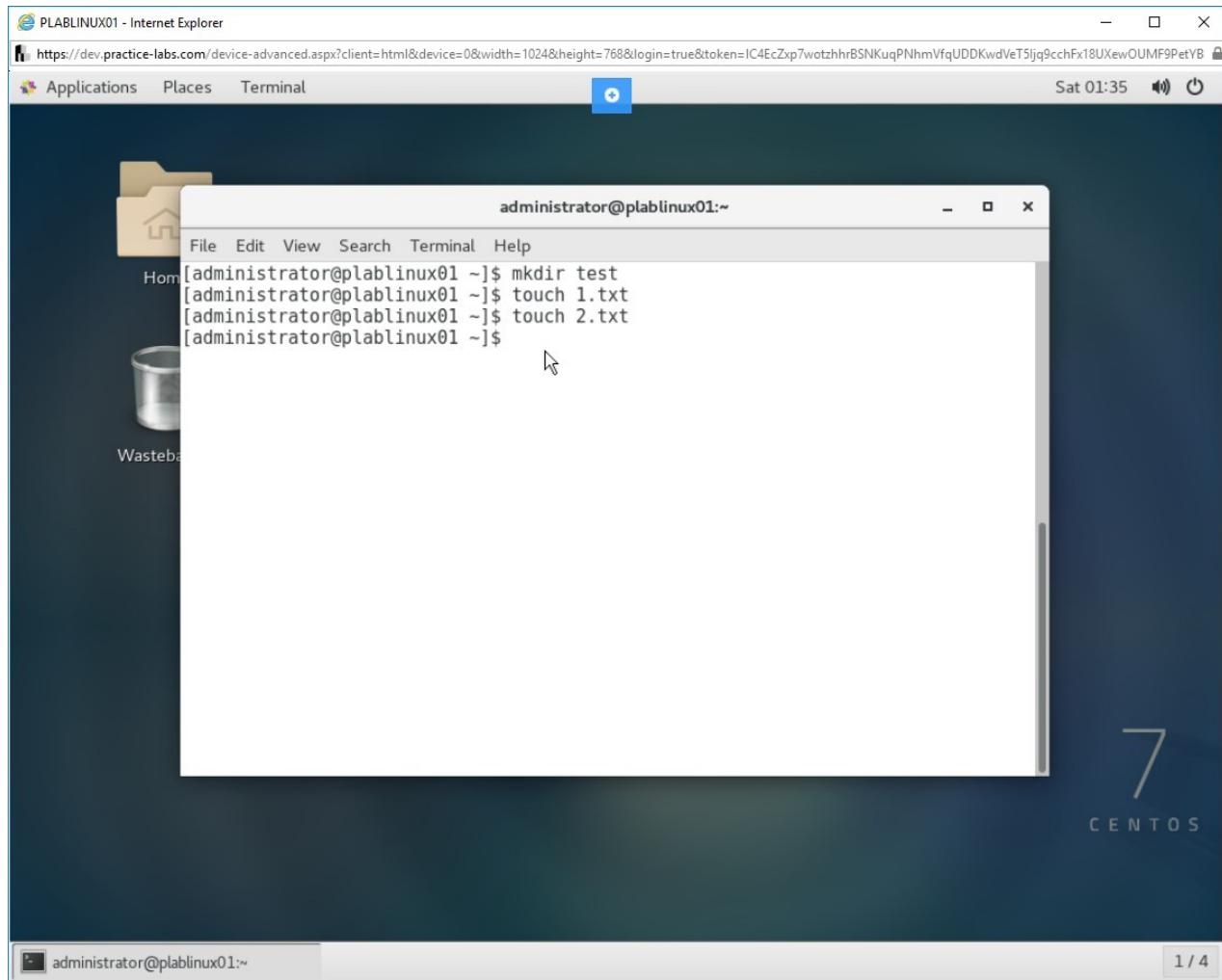


Figure 1.21 Screenshot of PLABLINUX01: Creating two text files with the touch command.

Step 3

To verify that the directory and both files have been created, type the following command:

```
ls
```

Press **Enter**.

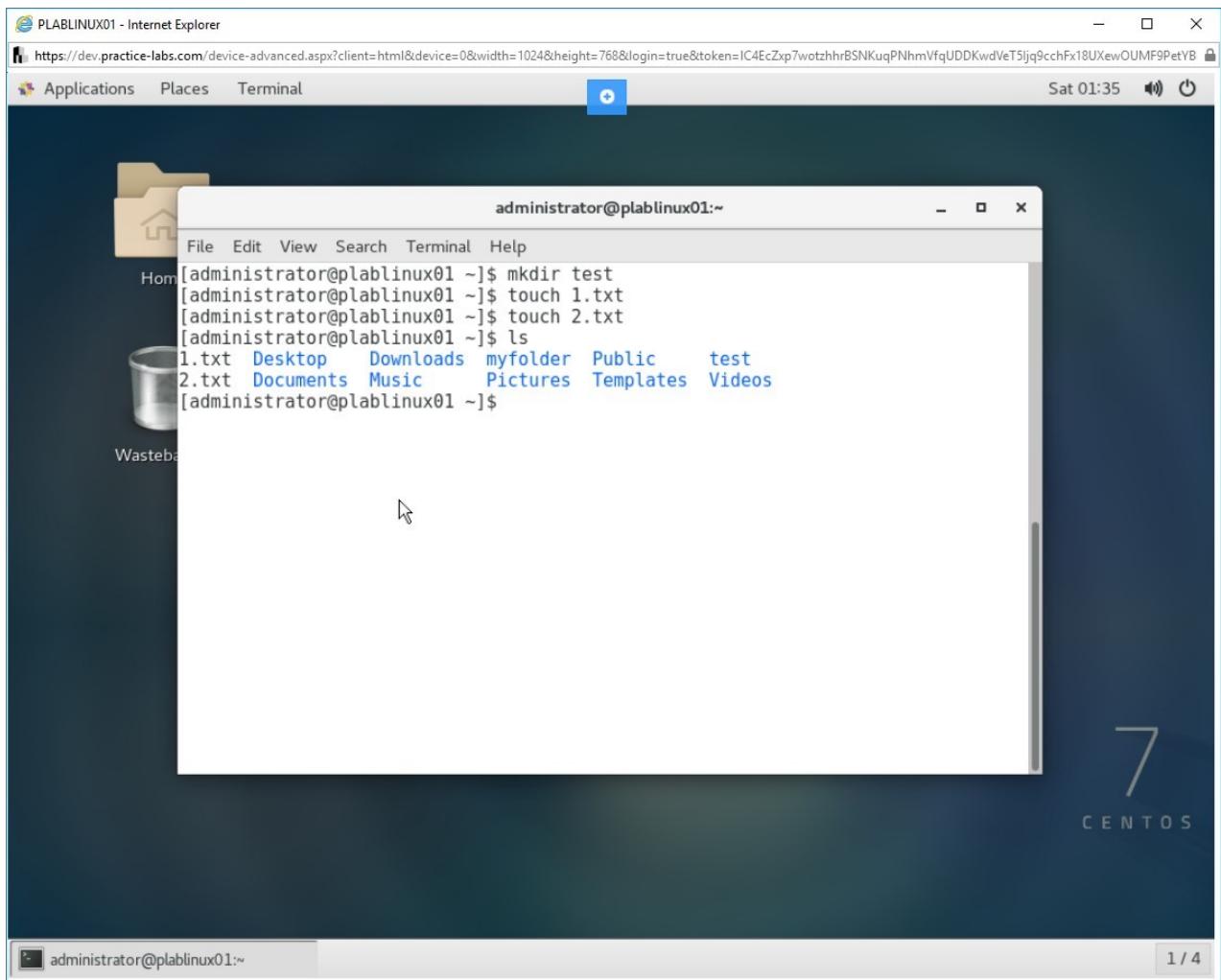


Figure 1.22 Screenshot of PLABLINUX01: Listing the contents of the directory.

Step 4

Move both the text files to the **test** directory. Type the following commands:

```
mv 1.txt test/  
mv 2.txt test/
```

Press **Enter**.

To verify that both the files have been moved from the parent directory, type the following command:

```
ls
```

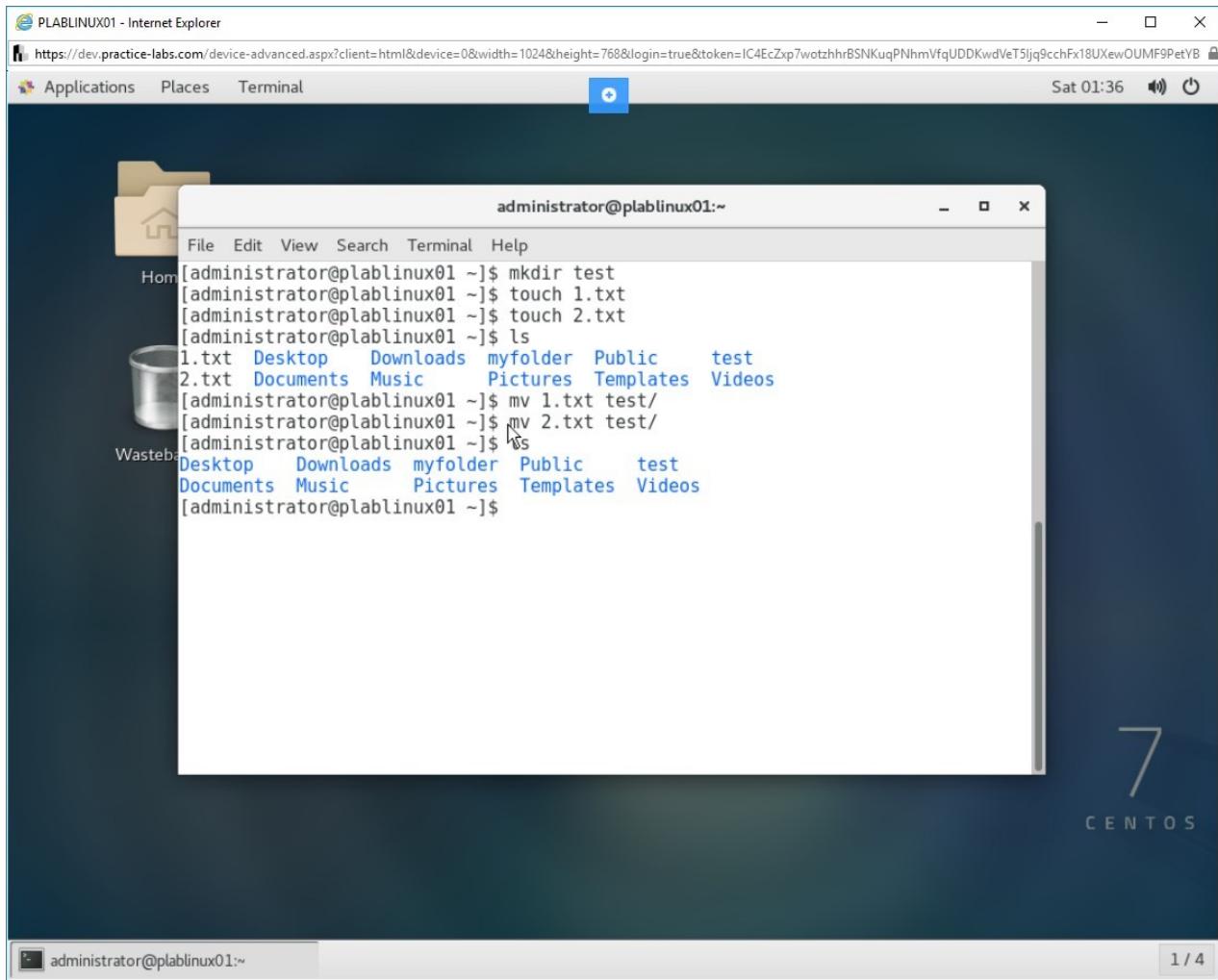


Figure 1.23 Screenshot of PLABLINUX01: Moving the text files to the test directory.

Step 5

Clear the screen by entering the following command:

```
clear
```

You can create a copy of the test directory with both the files. To do this, you need to use the **cp** command with the source and destination directory. Type the following command:

```
cp test newtest
```

Press Enter.

Notice that the command fails.

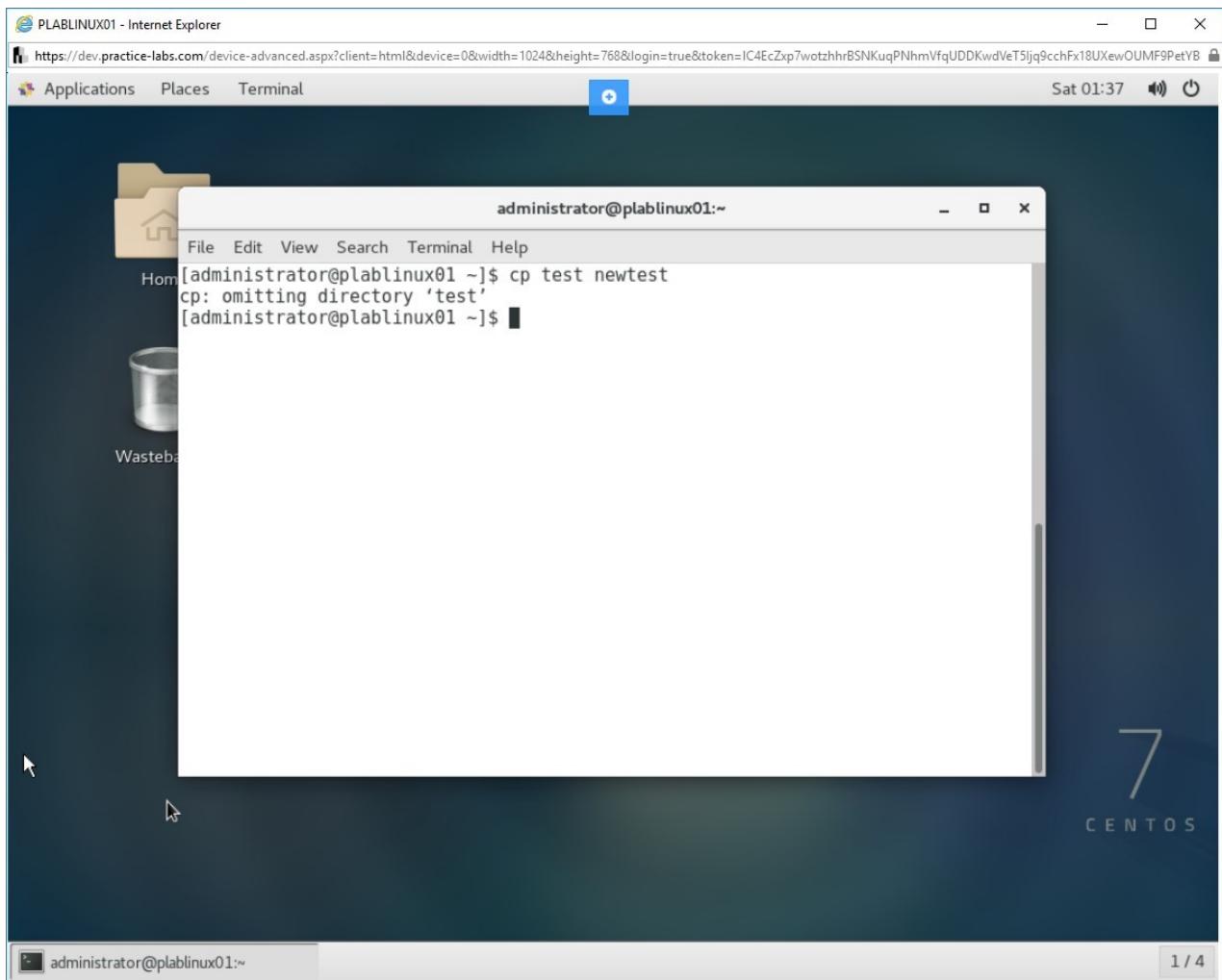


Figure 1.24 Screenshot of PLABLINUX01: Copying the test directory and its contents to the newtest directory.

Step 6

To copy a directory and the files contained in it to another directory, use the **-r** switch along with the **cp** command. Type the following command:

```
cp -r test newtest
```

Press Enter.

Notice that **-r** here is the wildcard. The **-r** switch enables the advanced file operation of copying a directory, along with the contained files, using a single command.

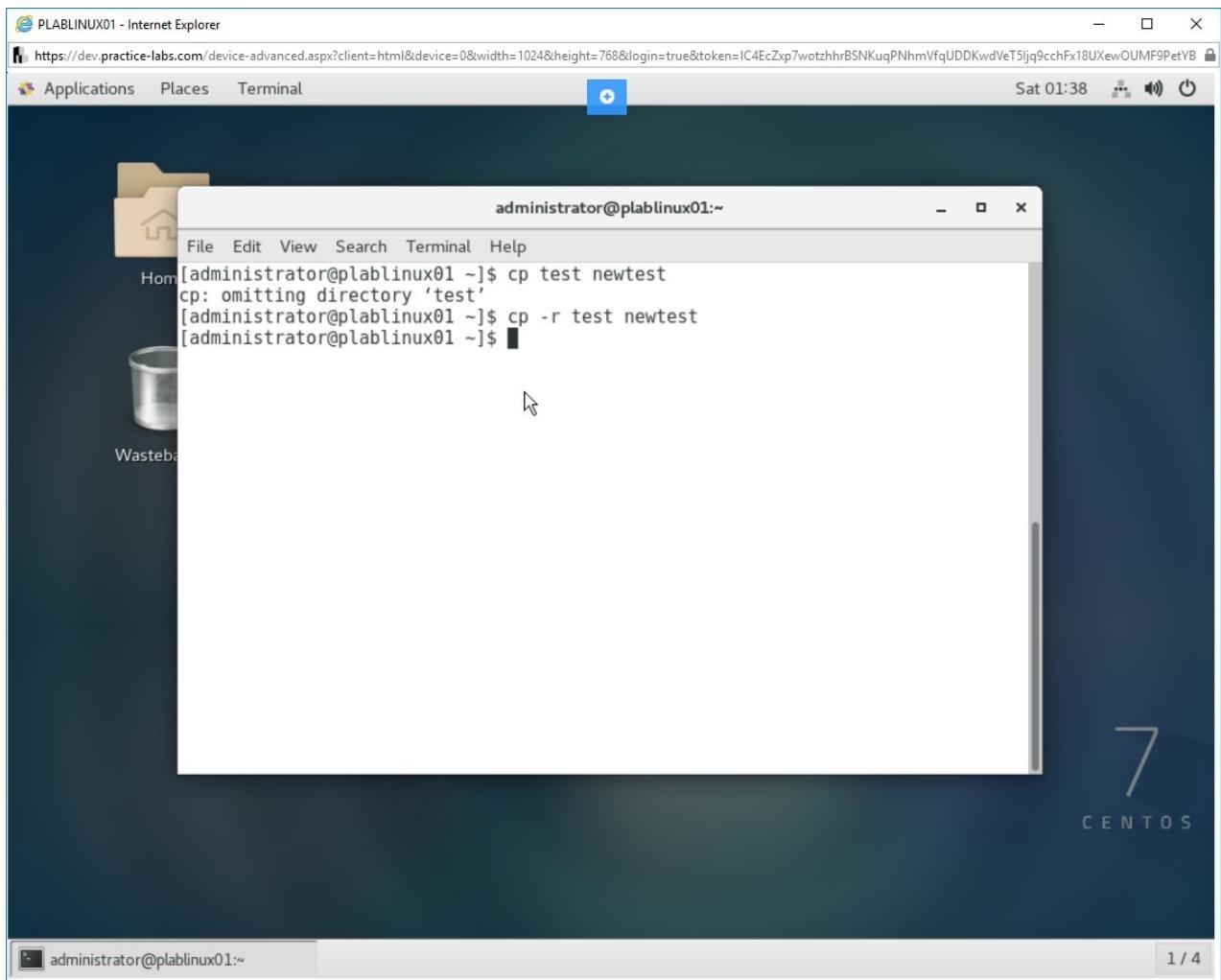


Figure 1.25 Screenshot of PLABLINUX01: Copying the test directory and its contents to the newtest director with the -r switch.

Step 7

Use the following command to verify that the directory is now copied:

```
ls
```

Press **Enter**.

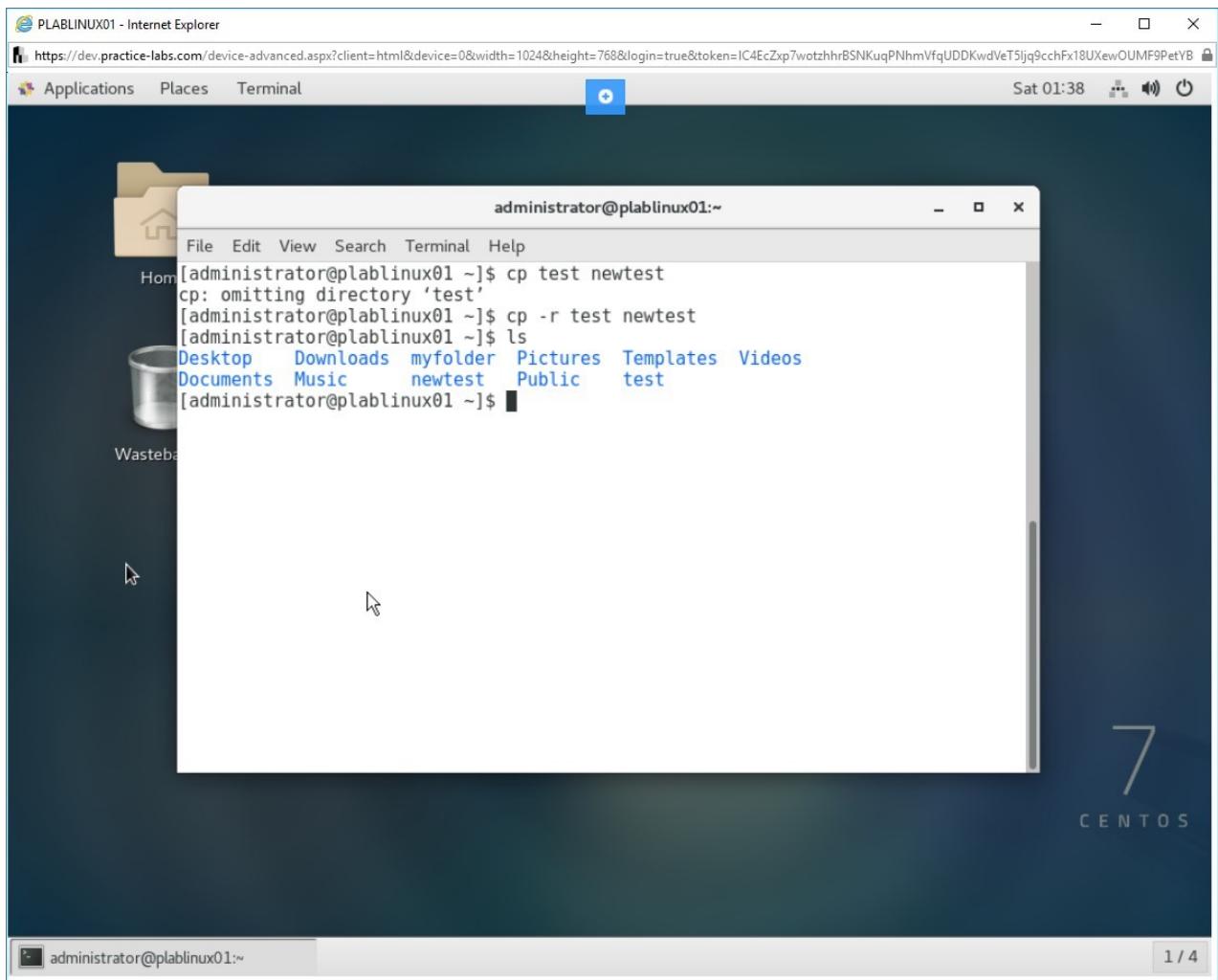


Figure 1.26 Screenshot of PLABLINUX01: Listing the contents of the directory.

Step 8

Verify both the files are also in the new directory, **newtest**. Type the following command:

```
ls newtest/
```

Press **Enter**.

Notice that both the files are present in the new directory as well.

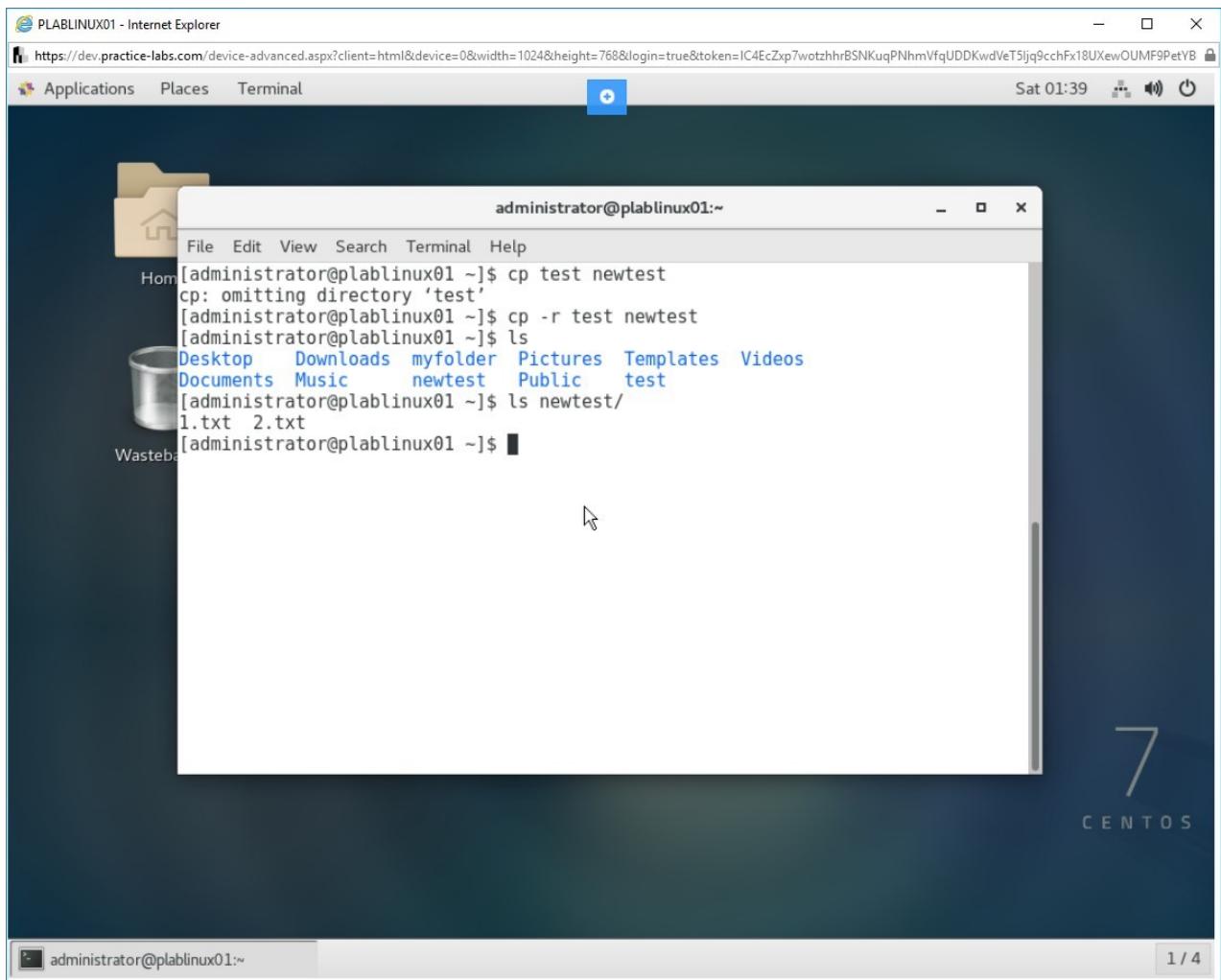


Figure 1.27 Screenshot of PLABLINUX01: Listing the contents of the newtest directory.

Step 9

Clear the screen by entering the following command:

```
clear
```

To remove all the files from a directory, type the following command:

```
rm -rf /test/*
```

Press **Enter**.

Notice that the “*” is a wildcard here that removes all the files with one command, saving the effort and time of repeating the command for each file.

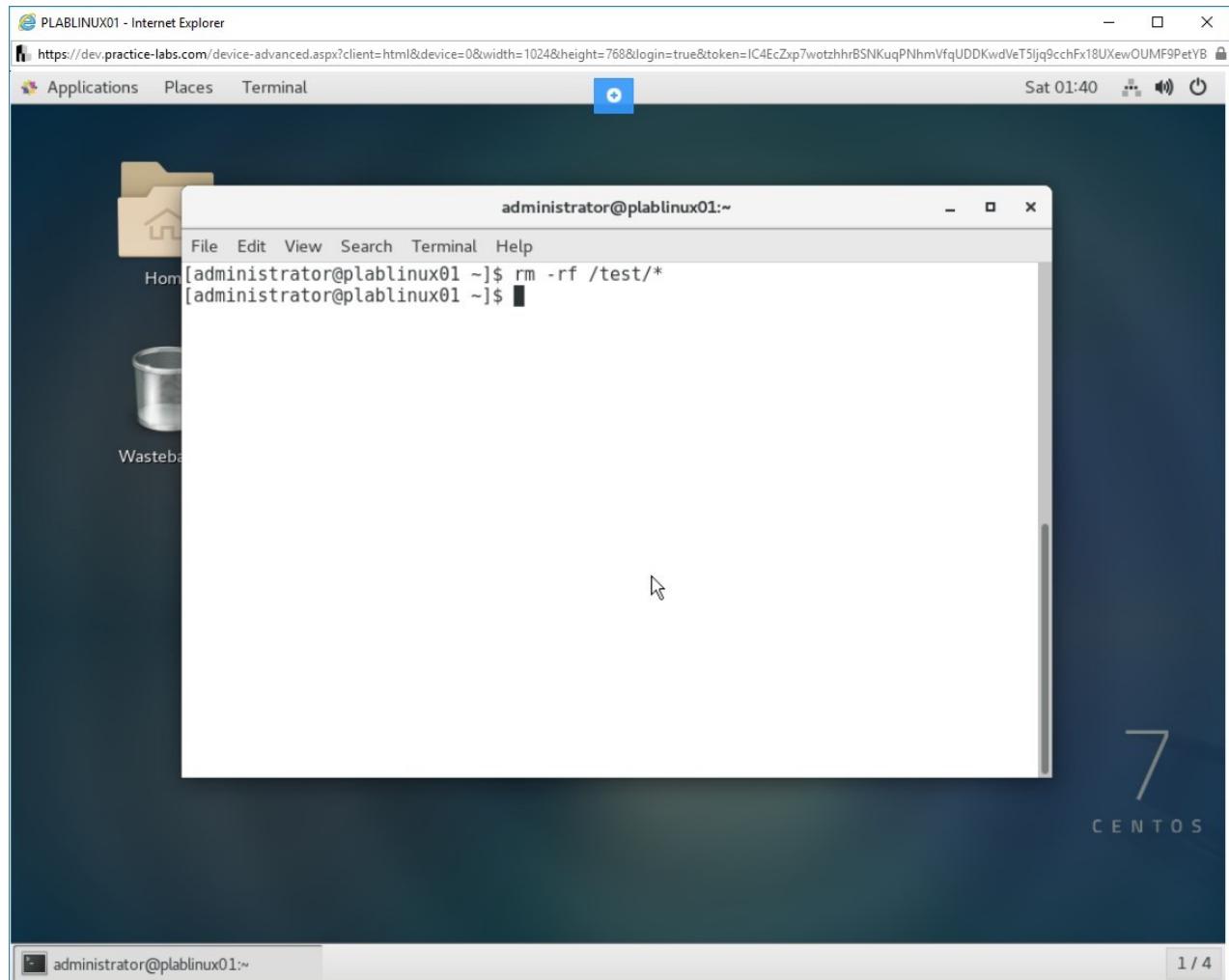


Figure 1.28 Screenshot of PLABLINUX01: Removing all files from the test directory.

Step 10

To remove a directory including the files, type the following command:

```
rm -r newtest
```

Press **Enter**.

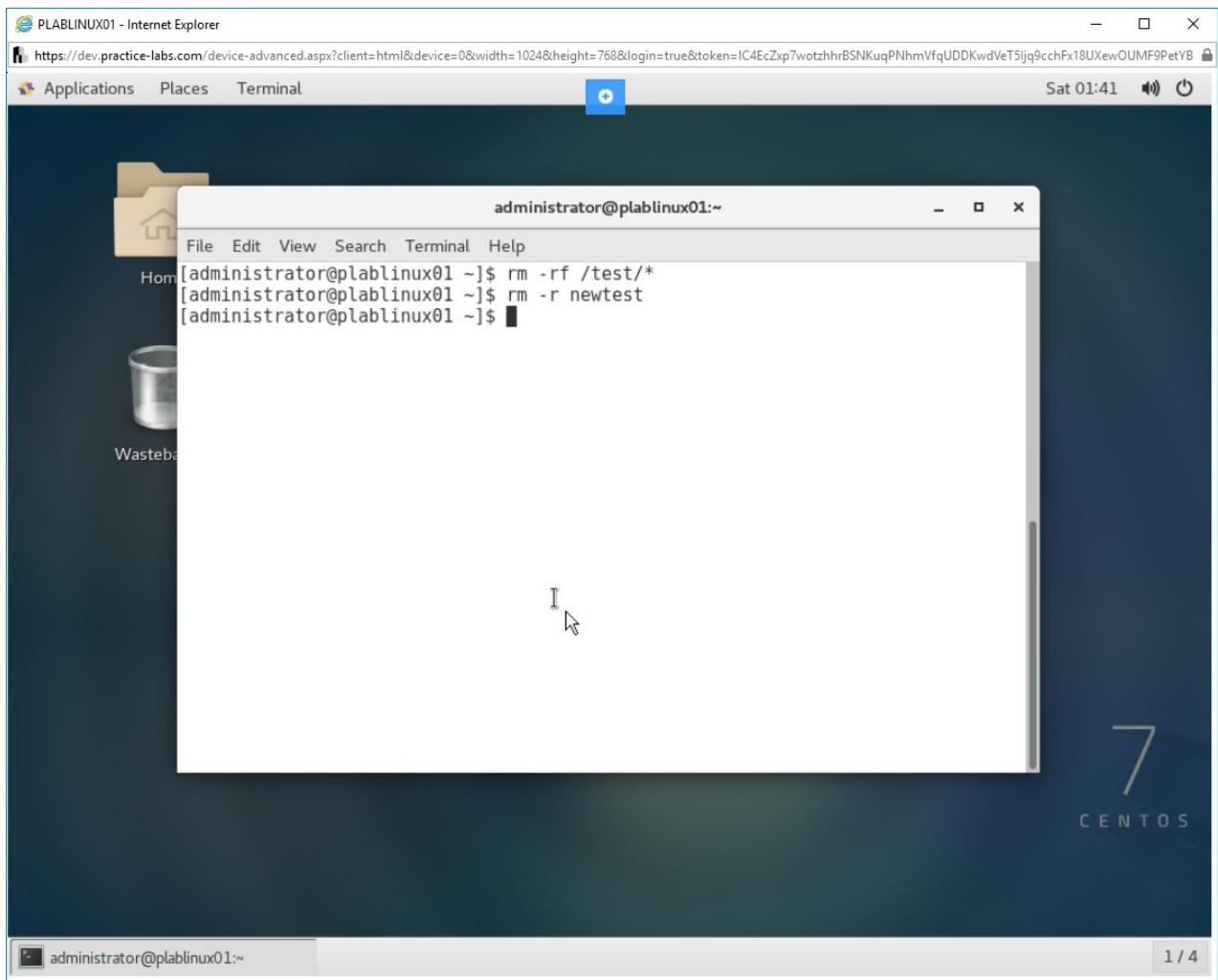


Figure 1.29 Screenshot of PLABLINUX01: Removing a directory with the files with the -r switch.

Task 3 - Use Wildcards to Manipulate Data in a File

You can use different wildcards to access and manage multiple files at a time. In this task, you will use the “*”, the “?”, and the “[]” wildcards to manipulate data.

To use wildcards to manipulate data in a file, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

To replace any number or combination of characters, you use the * wildcard. For example, to list all the files in directories with names starting with b, type the following

command:

```
ls -l /dev/b*
```

Press **Enter**.

Notice that all the file in directories with names starting with the alphabet “b” are displayed using a single command and without the need to specify the individual names.

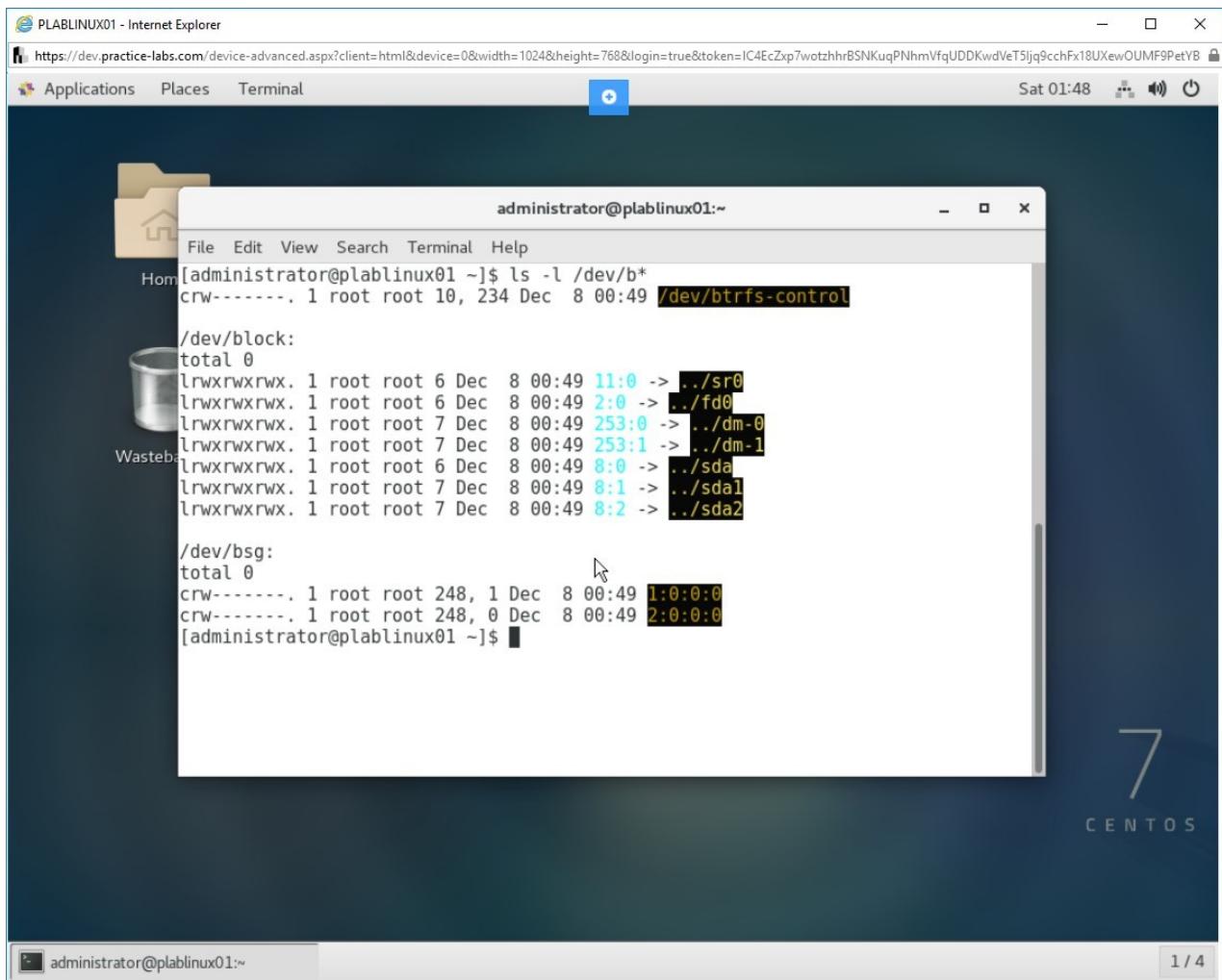


Figure 1.30 Screenshot of PLABLINUX01: Listing all files in directories with names starting with b.

Step 2

Clear the screen by entering the following command:

clear

To replace only one character, use ?

For example, to list the files, from the **dev** directory, that have names starting with r, type the following command:

```
ls -l /dev/r?*
```

Press **Enter**.

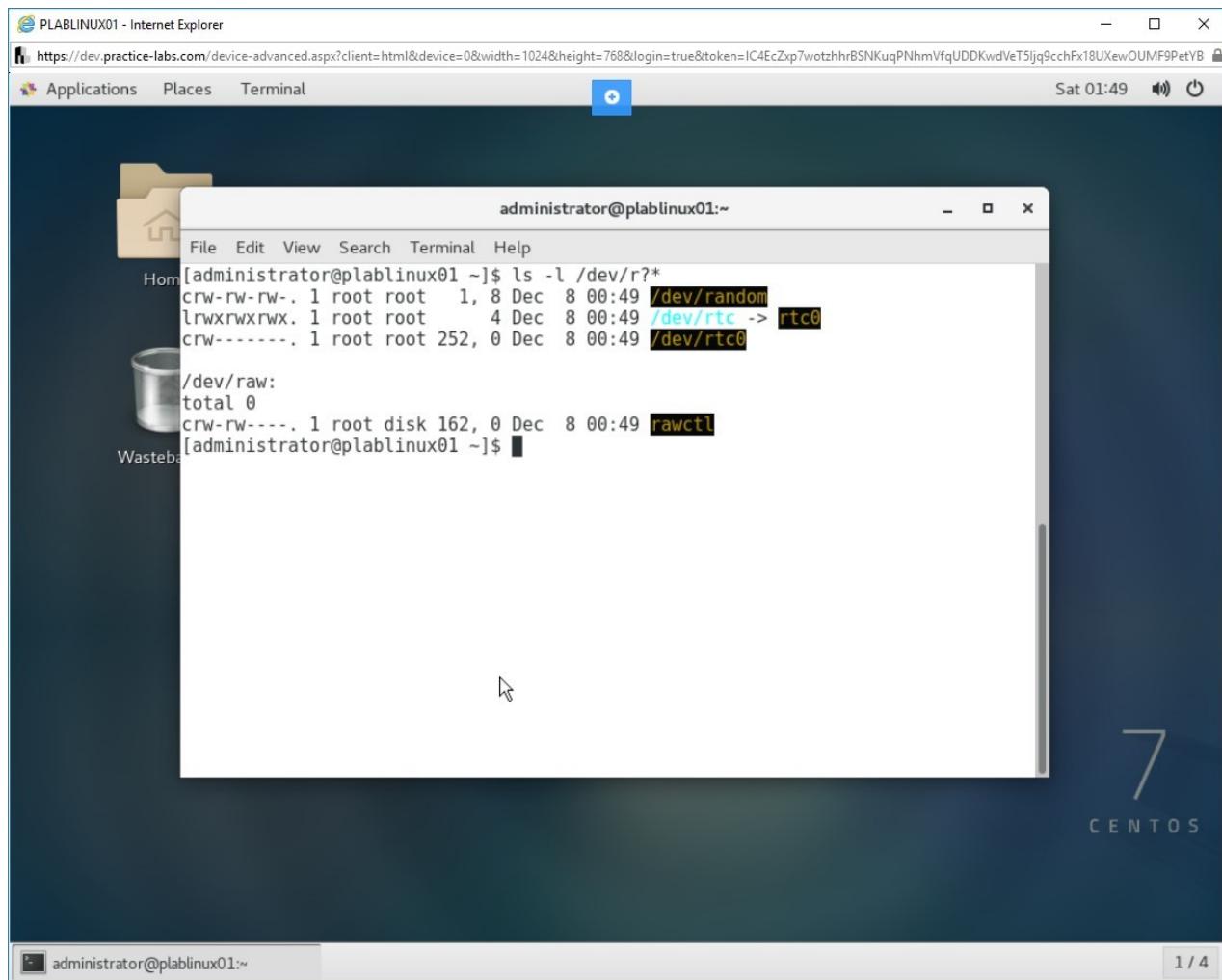


Figure 1.31 Screenshot of PLABLINUX01: List all files, from the dev directory that have names starting with r..

Step 3

Clear the screen by entering the following command:

```
clear
```

To find a range of values, use []. Examples, where the range needs to be determined, include:

- To list all files starting with an 'a' and have a digit in second position.
- To list all files that don't start with an 'a' or an 'A'
- To list the files in directory names starting with 'b'

In this task, let us list all files that don't start with an 'a' or an 'A', type the following command:

```
ls [ !Aa ]*
```

Press **Enter**.

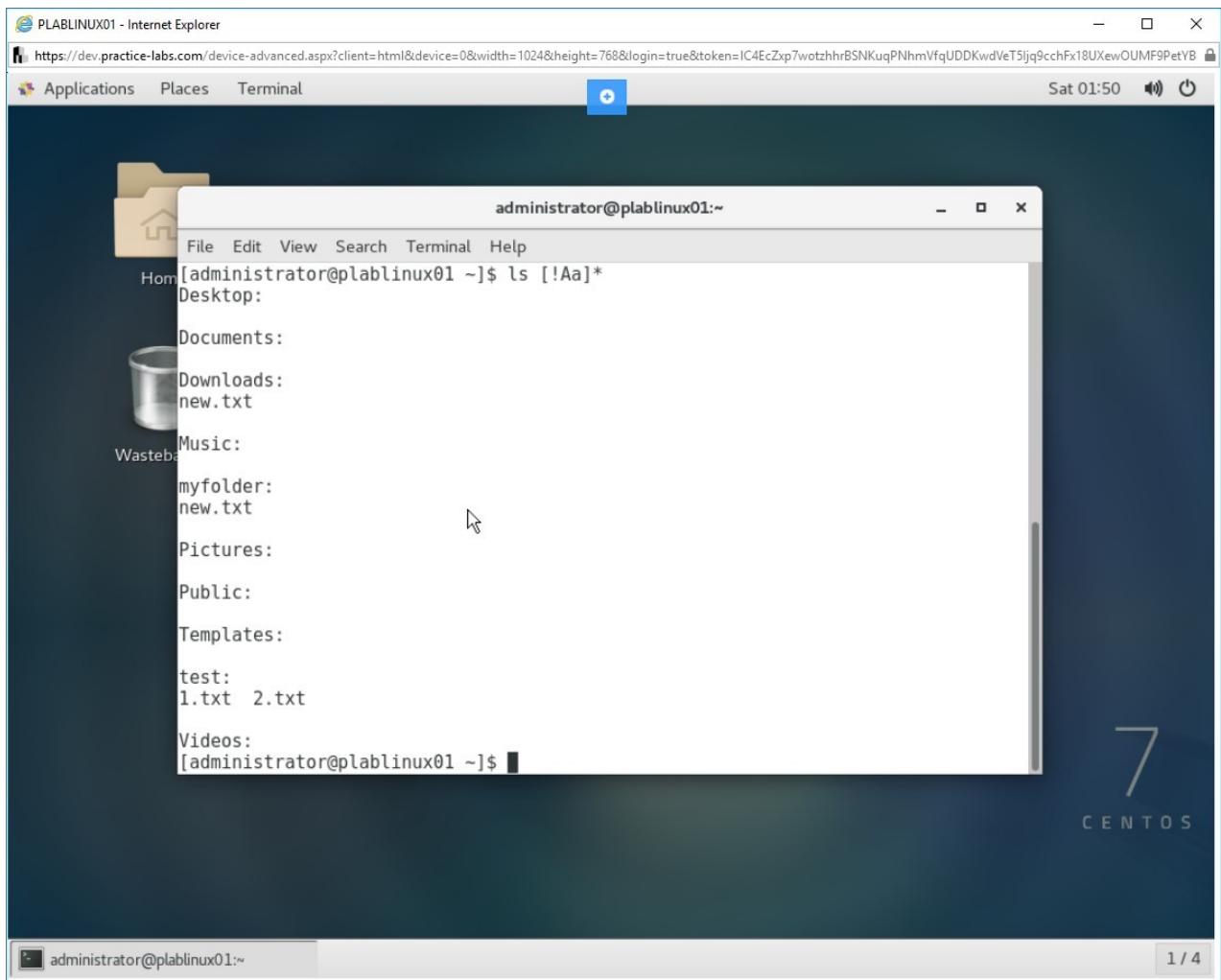


Figure 1.32 Screenshot of PLABLINUX01: Listing all files that don't start with an 'a' or an 'A'.

Step 4

Clear the screen by entering the following command:

```
clear
```

To find directories with a specific name, you can provide the range between the []
Type the following command:

```
ls D[eo]*
```

Press **Enter**.

Notice that the output lists all the files that have names starting with “De” or “Do”.

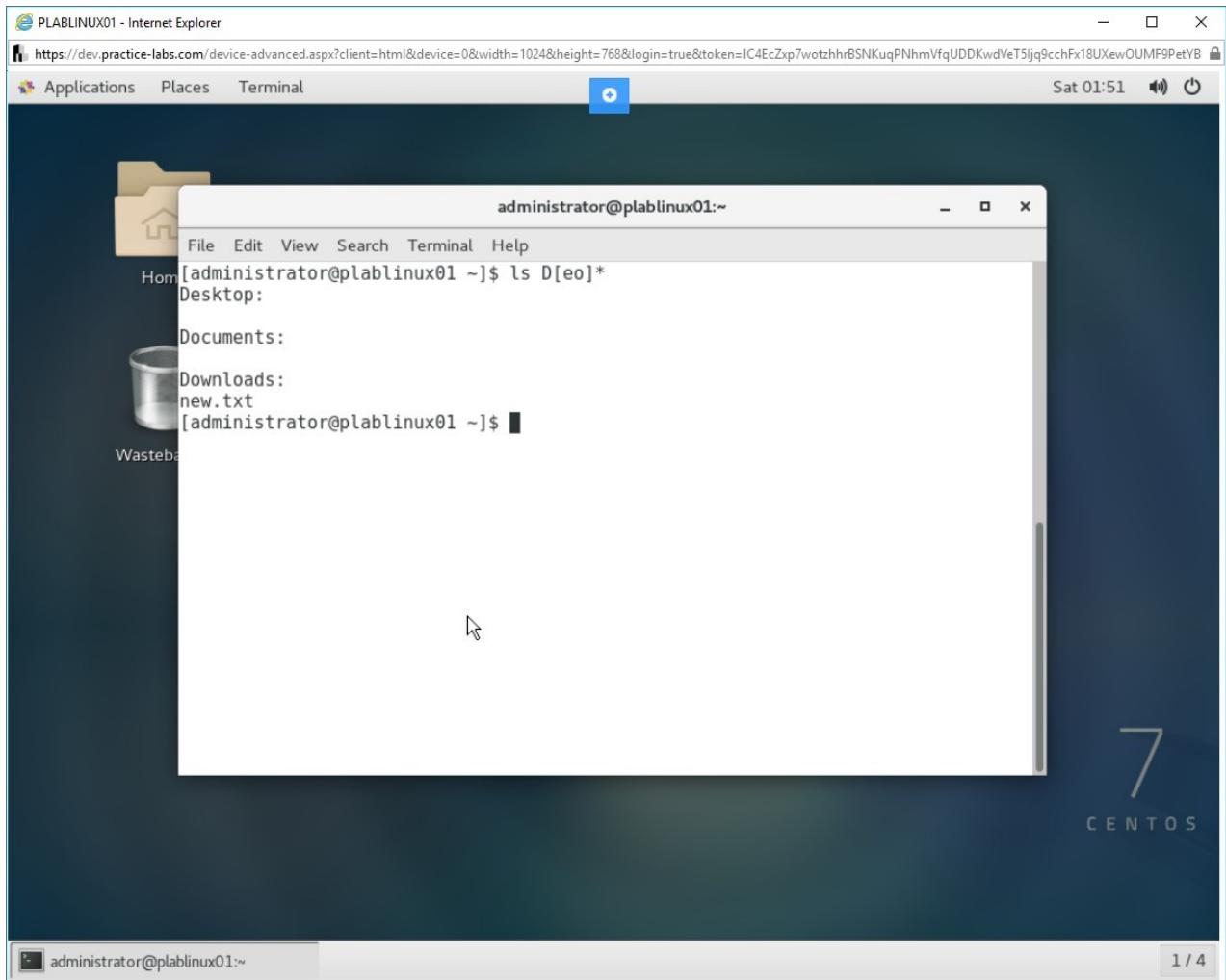


Figure 1.33 Screenshot of PLABLINUX01: Finding directories that have names starting with De or Do.

Task 4 - Use the Find Command

Linux provides a **find** command that you can use to locate and manipulate multiple files supporting common values for criteria such as name, type, size, or timestamp. In this task, you will use the find command to locate files based on specified criteria for name, type, size, and time.

To use the **find** command, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

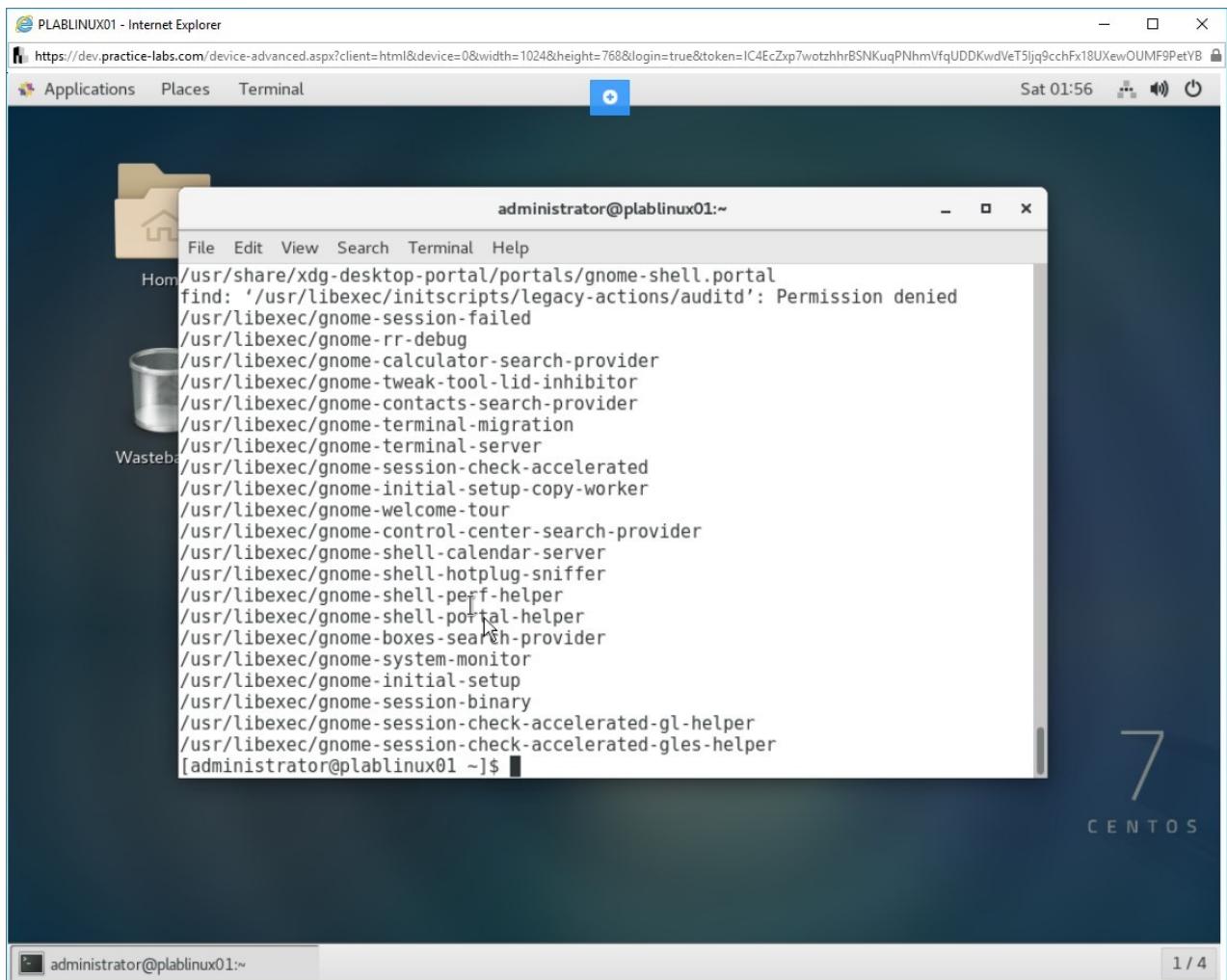
You can use the **find** command to find files based on specific criteria. Some of these criteria are listed below:

- **-type** specify the type of file
- **-name** name of the file (can include wildcards)
- **-user** user owner
- **-atime, ctime, mtime** access, creation and modified times (multiples of 24 hrs)
- **-amin, cmin, mmin** access, creation and modified times (multiples of 1 min)
- **-newer FILE** files newer than FILE

In the command below, you will find files starting with **gnome** for a user named **root**. To find these files, type the following command:

```
find / -user root -name "gnome*"
```

Press **Enter**.



The screenshot shows a Linux desktop environment with a dark blue theme. A terminal window is open in the foreground, displaying the output of a 'find' command. The command is: 'find / -user root -name "gnome*"'.

```
administrator@plablinux01:~$ find / -user root -name "gnome*"
Hon/ /usr/share/xdg-desktop-portal/portals/gnome-shell.portal
Hon/ /usr/libexec/initscripts/legacy-actions/auditd': Permission denied
Hon/ /usr/libexec/gnome-session-failed
Hon/ /usr/libexec/gnome-rr-debug
Hon/ /usr/libexec/gnome-calculator-search-provider
Hon/ /usr/libexec/gnome-tweak-tool-lid-inhibitor
Hon/ /usr/libexec/gnome-contacts-search-provider
Hon/ /usr/libexec/gnome-terminal-migration
Hon/ /usr/libexec/gnome-terminal-server
Wasteba/ /usr/libexec/gnome-session-check-accelerated
Hon/ /usr/libexec/gnome-initial-setup-copy-worker
Hon/ /usr/libexec/gnome-welcome-tour
Hon/ /usr/libexec/gnome-control-center-search-provider
Hon/ /usr/libexec/gnome-shell-calendar-server
Hon/ /usr/libexec/gnome-shell-hotplug-sniffer
Hon/ /usr/libexec/gnome-shell-perf-helper
Hon/ /usr/libexec/gnome-shell-porcelain-helper
Hon/ /usr/libexec/gnome-boxes-search-provider
Hon/ /usr/libexec/gnome-system-monitor
Hon/ /usr/libexec/gnome-initial-setup
Hon/ /usr/libexec/gnome-session-binary
Hon/ /usr/libexec/gnome-session-check-accelerated-gl-helper
Hon/ /usr/libexec/gnome-session-check-accelerated-gles-helper
[administrator@plablinux01 ~]$
```

The terminal window has a title bar 'administrator@plablinux01:~'. The desktop background features a large number '7' and the word 'CENTOS'.

Figure 1.34 Screenshot of PLABLINUX01: Finding files starting with gnome for a user named root.

Step 2

Clear the screen by entering the following command:

```
clear
```

To find a specific type of file for a user, type the following command:

```
find / -user root -type f
```

Press **Enter**.

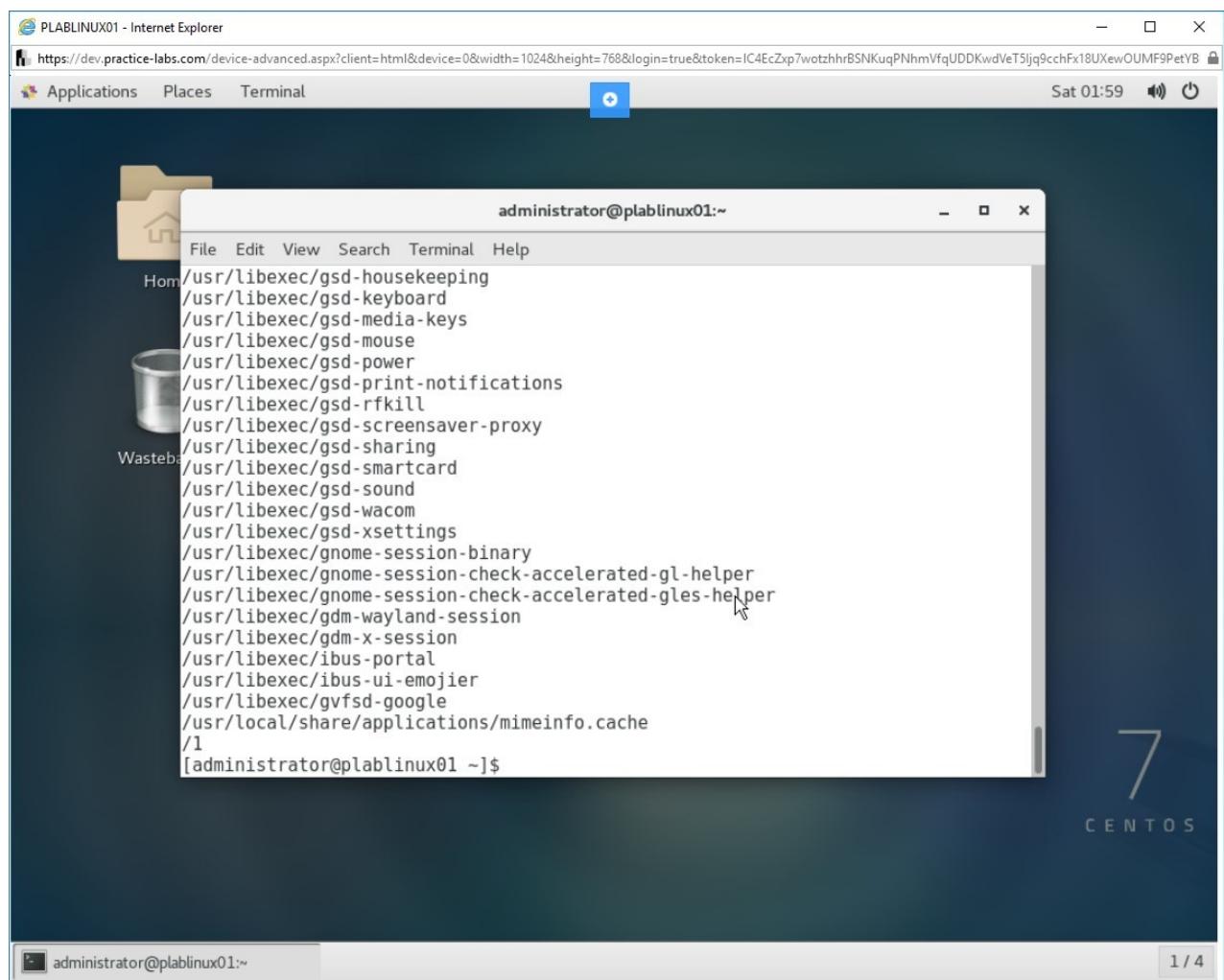


Figure 1.35 Screenshot of PLABLINUX01: Finding a specific type of file for a user.

Step 3

Clear the screen by entering the following command:

```
clear
```

To find files that were modified a number of days ago, type the following command:

```
find . -mtime +60
```

Press **Enter**.

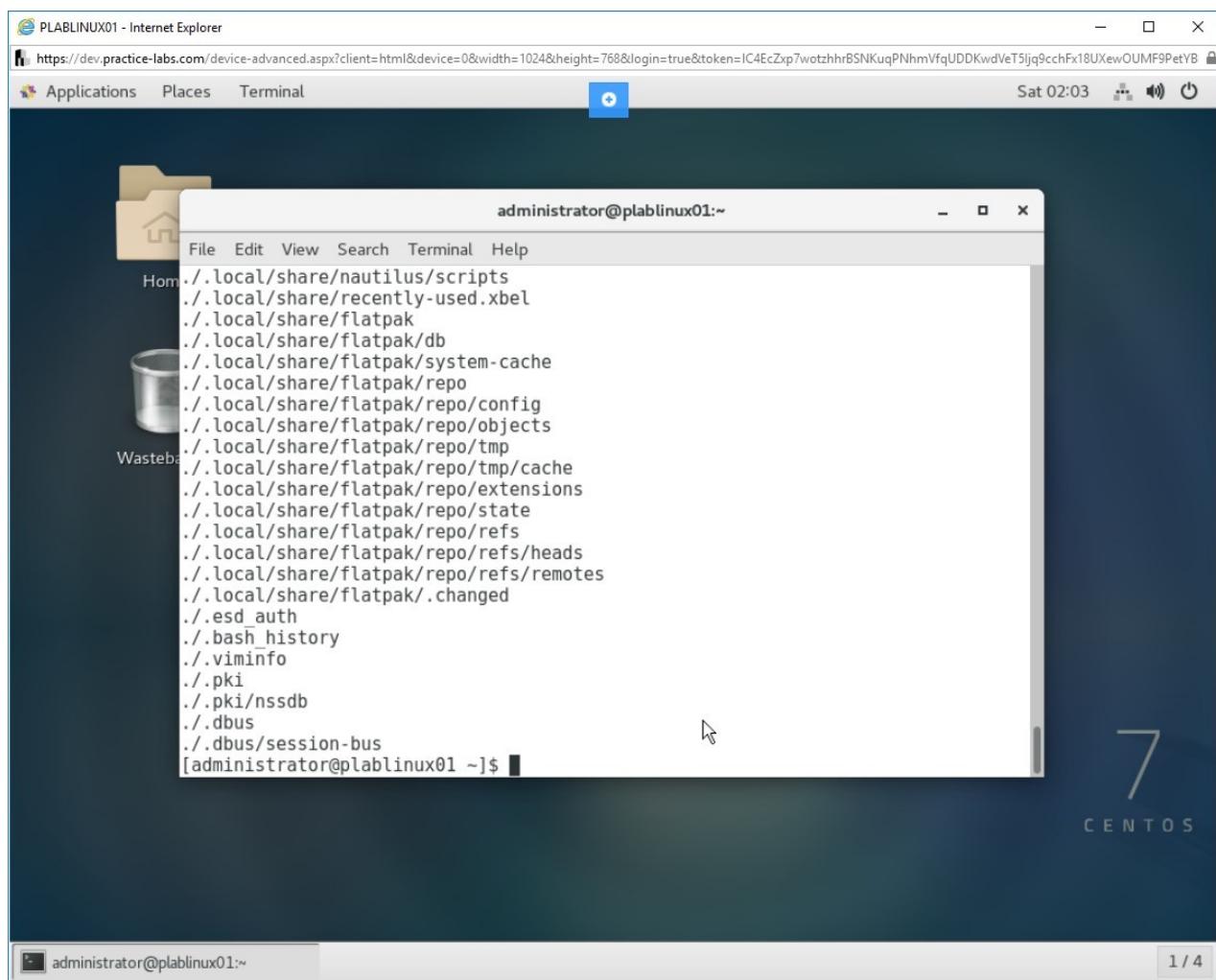


Figure 1.36 Screenshot of PLABLINUX01: Finding files that were modified a number of days ago.

Step 4

Clear the screen by entering the following command:

```
clear
```

To list all files over 2MB in the current directory and subdirectories, , type the following command:

```
find . -size +2M
```

Press **Enter**.

The screenshot shows a Linux desktop environment with a dark blue theme. A terminal window is open in the foreground, displaying the command output. The terminal window title is "administrator@plablinux01:~". The command entered is "find . -size +2M". The output shows several file paths, mostly related to Mozilla Firefox cache files, indicating they are over 2MB in size. In the background, there's a desktop interface with icons for Applications, Places, and Terminal. The top bar shows the URL "https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&ttoken=IC4EcZxp7wotzhhrBSNKuqPNhmVfqUDDKwdVeT5ljq9cchFx18UXewOUMF9PetYB" and the system status "Sat 02:31". The bottom right corner of the desktop has the "CENTOS 7" logo.

```
administrator@plablinux01:~$ find . -size +2M
./mozilla/firefox/jqka2vsv.default/places.sqlite
./mozilla/firefox/jqka2vsv.default/storage/about+newtab/idb/3312185054s
bndi_pspte.files/1
./mozilla/firefox/jqka2vsv.default/favicons.sqlite
./cache/mozilla/firefox/jqka2vsv.default/startupCache/startupCache.8.little
./cache/mozilla/firefox/jqka2vsv.default/startupCache/scriptCache-current.bin
./cache/mozilla/firefox/jqka2vsv.default/startupCache/scriptCache.bin
./cache/mozilla/firefox/jqka2vsv.default/safebrowsing/google4/goog-phish-proto.
Wastebin/pset
[administrator@plablinux01 ~]$
```

Figure 1.37 Screenshot of PLABLINUX01: Listing all files over 2MB in the current directory and subdirectories.

Task 5 - Use the tar and cpio Commands

Linux offers tools to help you manage your files and data. tar, cpio, and dd are examples of such tools. You can use these tools to create archives, to extract the files from an archive, or create an iso image from a CDROM.

To use tar, cpio and dd commands, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Create multiple txt files using the touch command. For the demonstration purpose, three files are created: **output.txt**, **1.txt**, and **2.txt**. Type the following command to create **1.txt**:

```
touch 1.txt
```

Press **Enter**.

Similarly, create **2.txt** and **output.txt**.

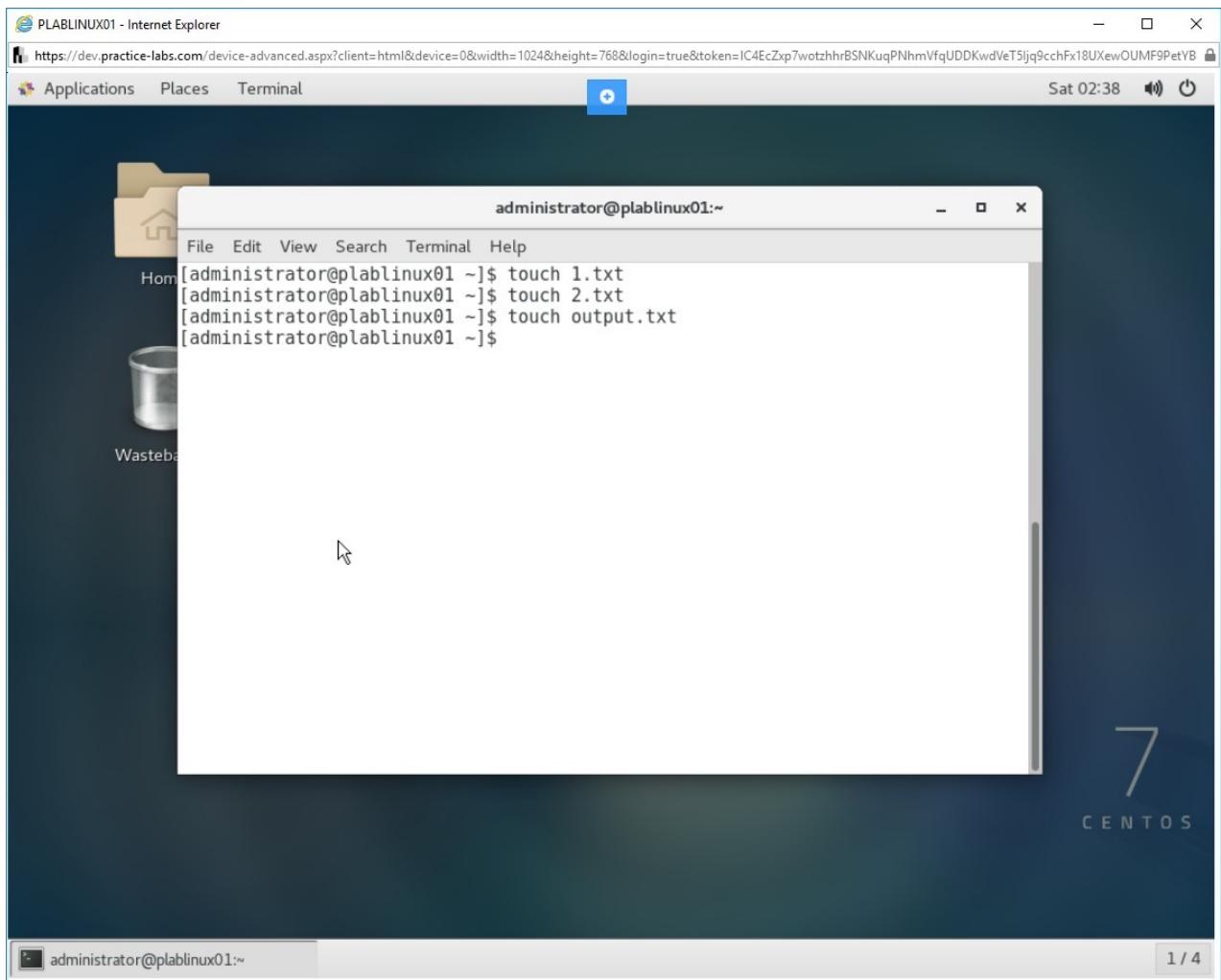


Figure 1.38 Screenshot of PLABLINUX01: Creating text files with the touch command.

Further, create an archive file using the tar command. Enter the following command:

```
tar -cvjf test.tar.bz *.txt
```

The switches used with the **tar** command:

- **c** - to create the archive
- **v** - to display the verbose output during archive creation
- **j** - to compress the archive with **bzip** compression. You can use the '**z**' switch to use **gzip** compression
- **f** - to name the file that is being created

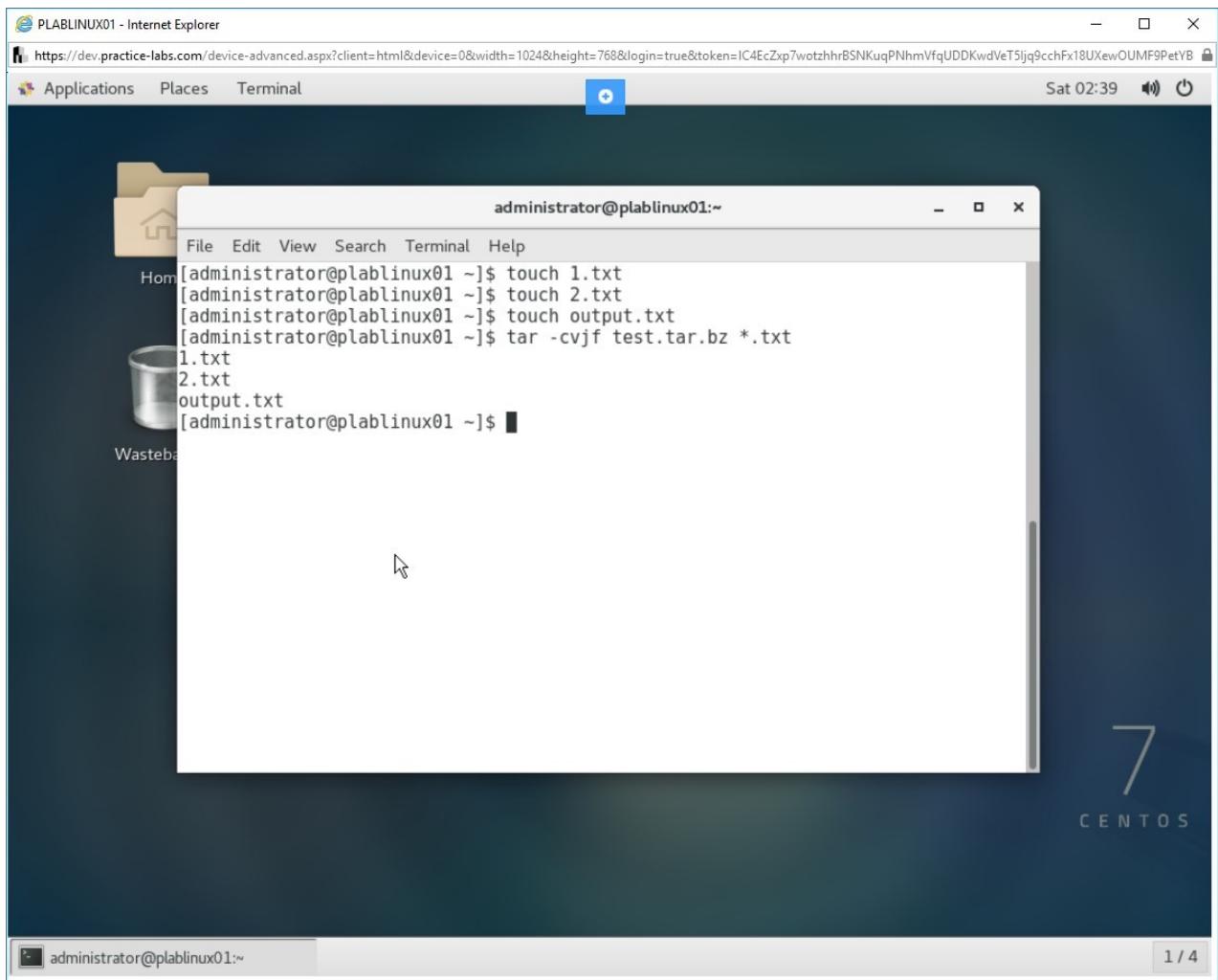


Figure 1.39 Screenshot of PLABLINUX01: Creating an archive file using the tar command.

Step 2

Type the following command to verify that the archive file now exists:

```
ls
```

Press **Enter**.

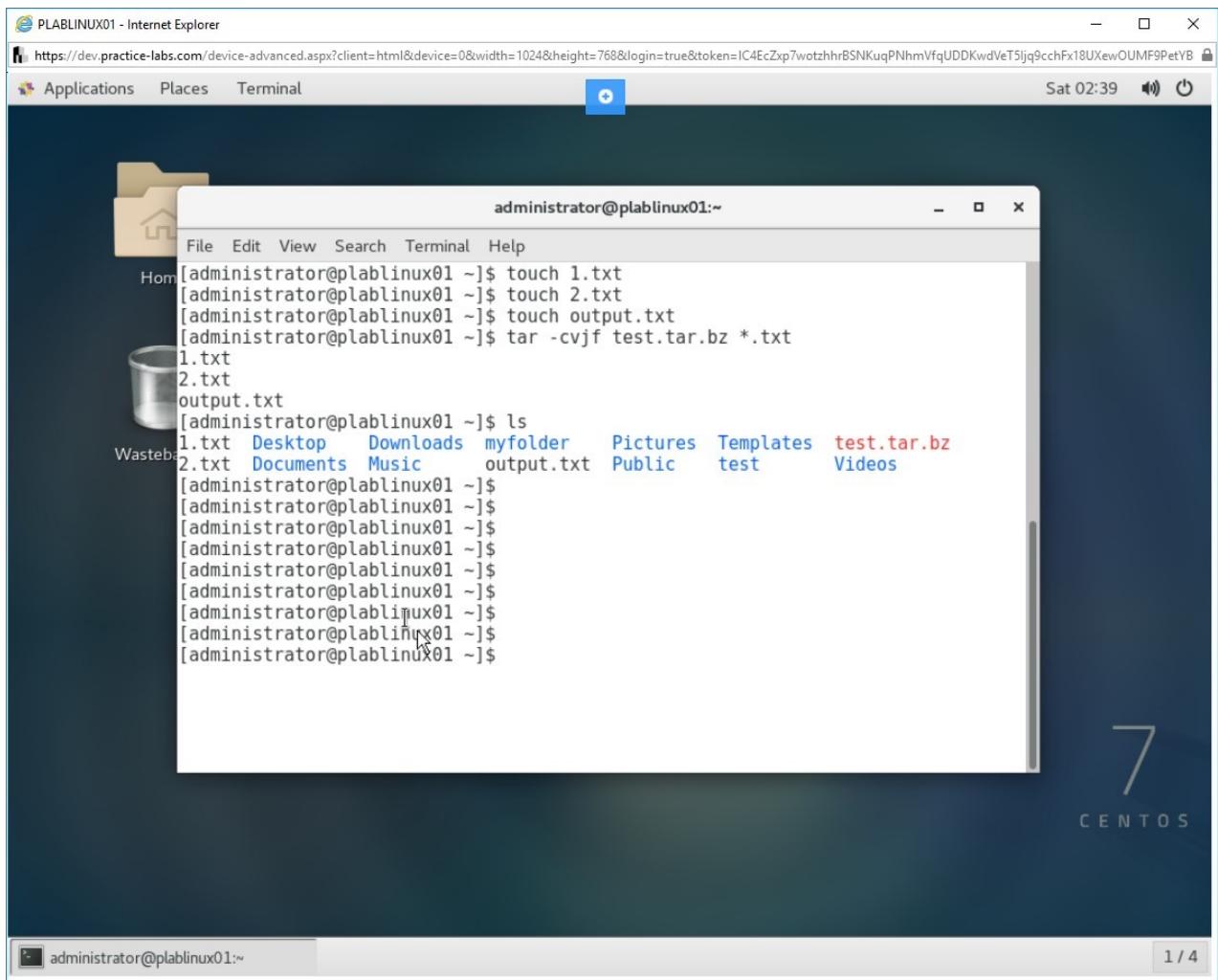


Figure 1.40 Screenshot of PLABLINUX01: Listing the contents of the directory.

Step 3

After you have created the file, you can extract it as well using the tar command. Let's first copy the archive file into a different directory. Type the following command:

```
cp test.tar.bz Downloads
```

Press **Enter**.

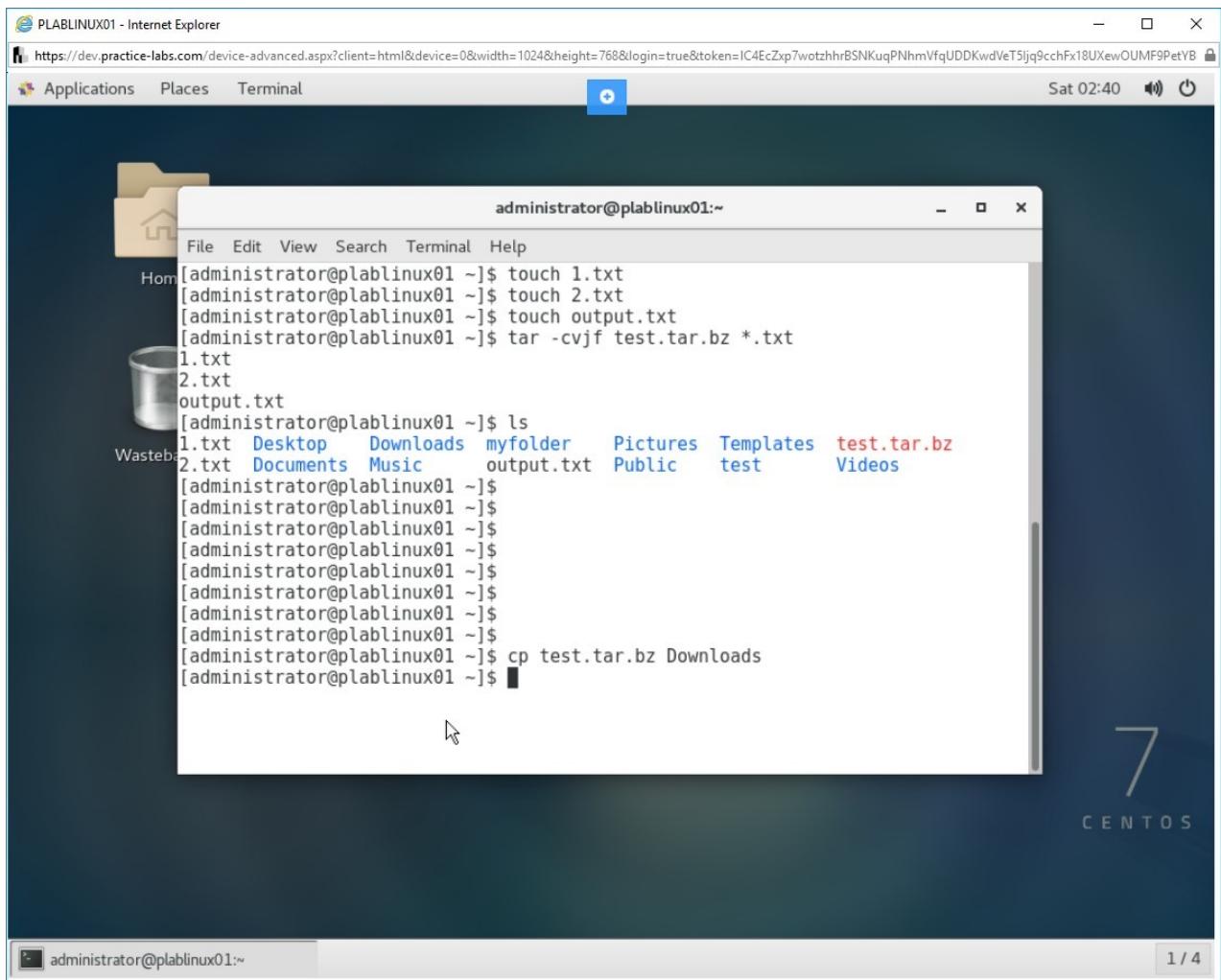


Figure 1.41 Screenshot of PLABLINUX01: Copying the archive file into the Downloads directory.

Step 4

Clear the screen by entering the following command:

```
clear
```

Verify that the **test.tar.bz** file exists in the **Downloads** directory. Type the following command:

```
ls Downloads/
```

Press **Enter**.

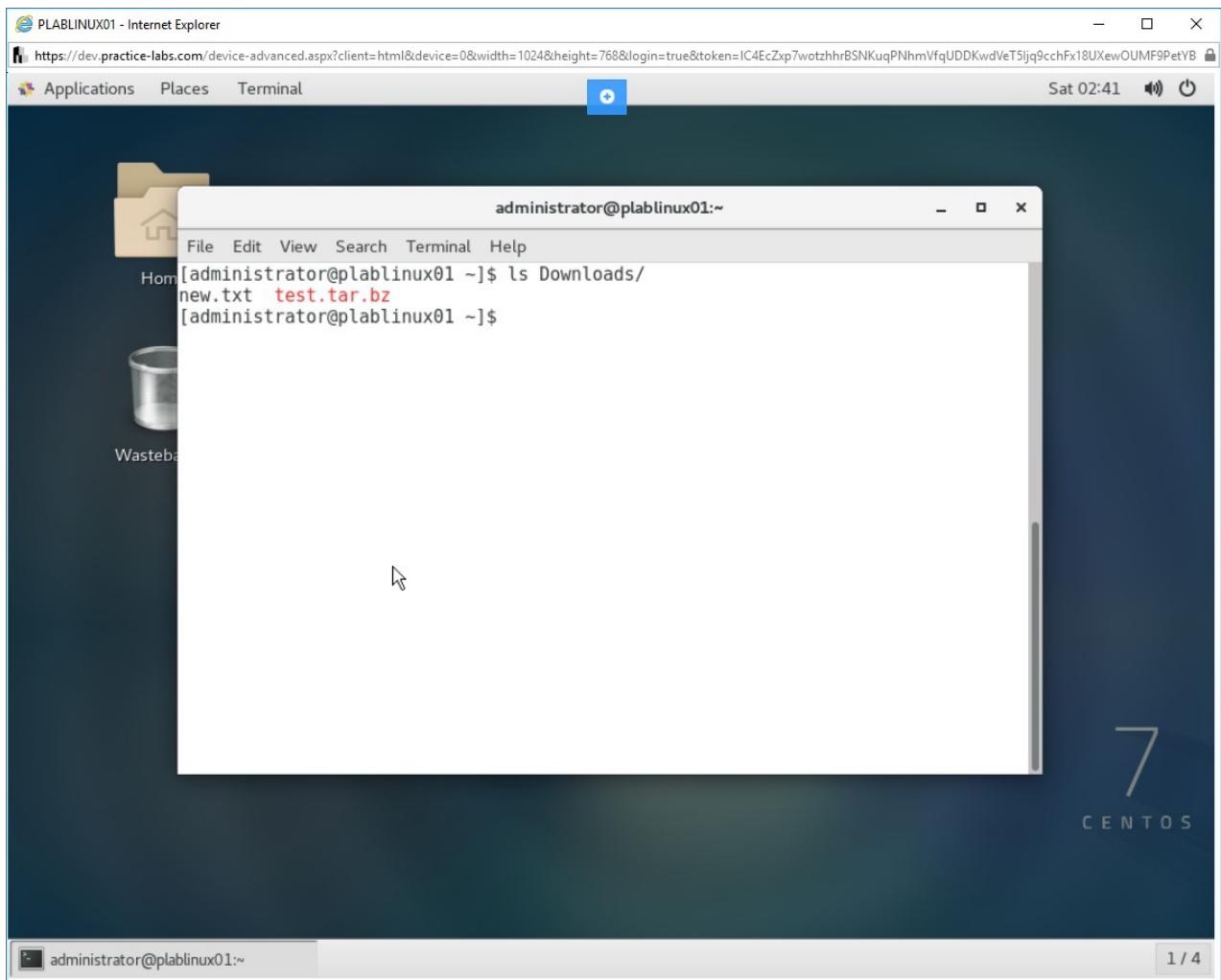


Figure 1.42 Screenshot of PLABLINUX01: Listing the contents of the Downloads directory.

Step 5

Navigate to the **Downloads** directory using the following command:

```
cd Downloads
```

To extract the archive file, type the following command:

```
tar -xvf test.tar.bz
```

Press **Enter**.

Notice that the three files tarred in the earlier step are now extracted into the specified directory.

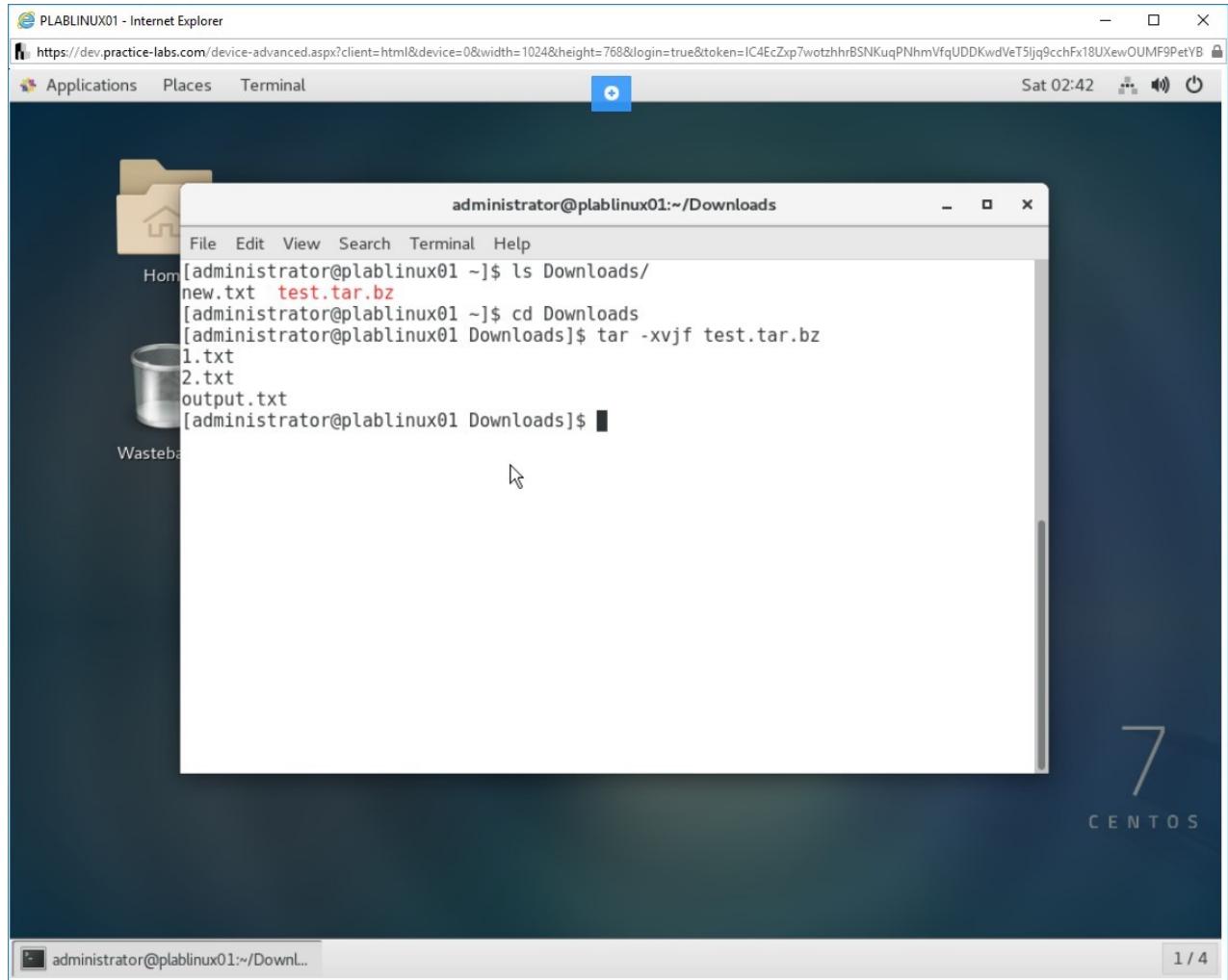


Figure 1.43 Screenshot of PLABLINUX01: Extracting the archive file with the tar command.

Step 6

To list the files in the **Downloads** directory to verify that the files have been extracted, type the following command:

```
ls
```

Press **Enter**.

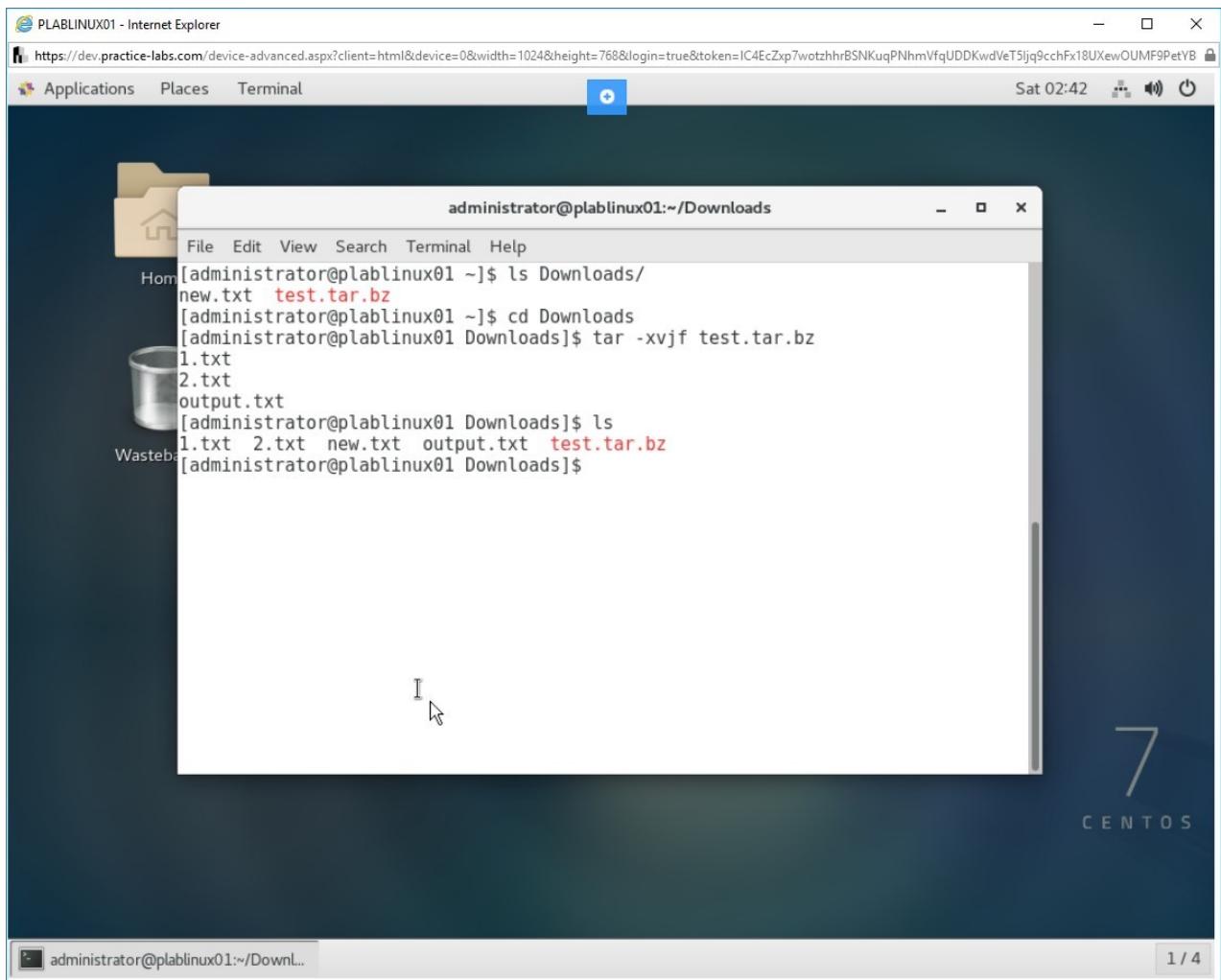


Figure 1.44 Screenshot of PLABLINUX01: Listing the contents of the directory.

Step 7

Clear the screen by entering the following command:

```
clear
```

You can also list the contents of the archive file without extracting it. To list the contents, type the following command:

```
tar -tf test.tar.bz
```

Press **Enter**.

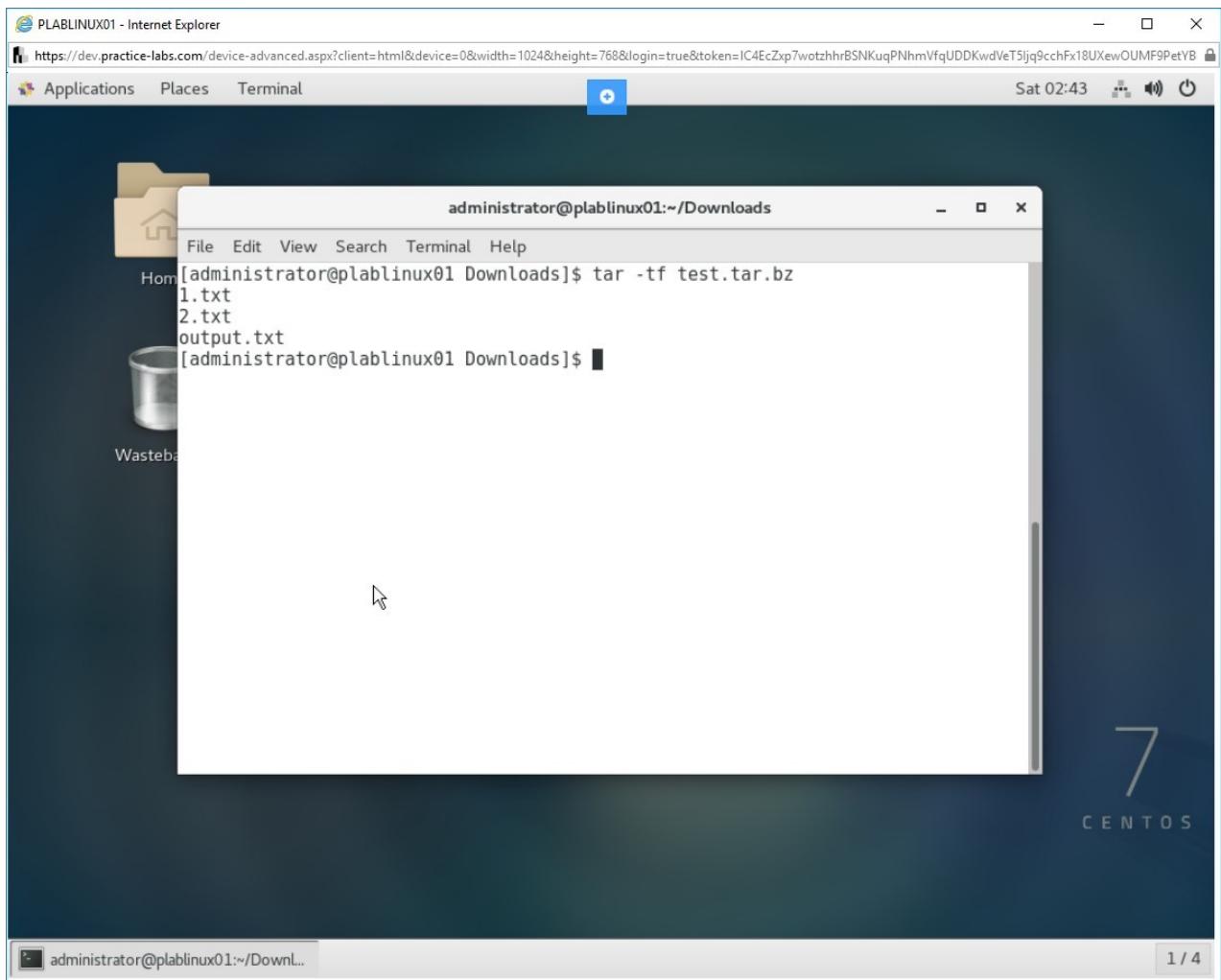


Figure 1.45 Screenshot of PLABLINUX01: Viewing the contents of the archive file without extracting it.

Step 8

Clear the screen by entering the following command:

```
clear
```

You can now create an archive file using the cpio command. Although, in the current scenario, the cpio command has been superseded by the tar command.

Type the following command:

```
ls | cpio -ov > text.cpio
```

Press **Enter**.

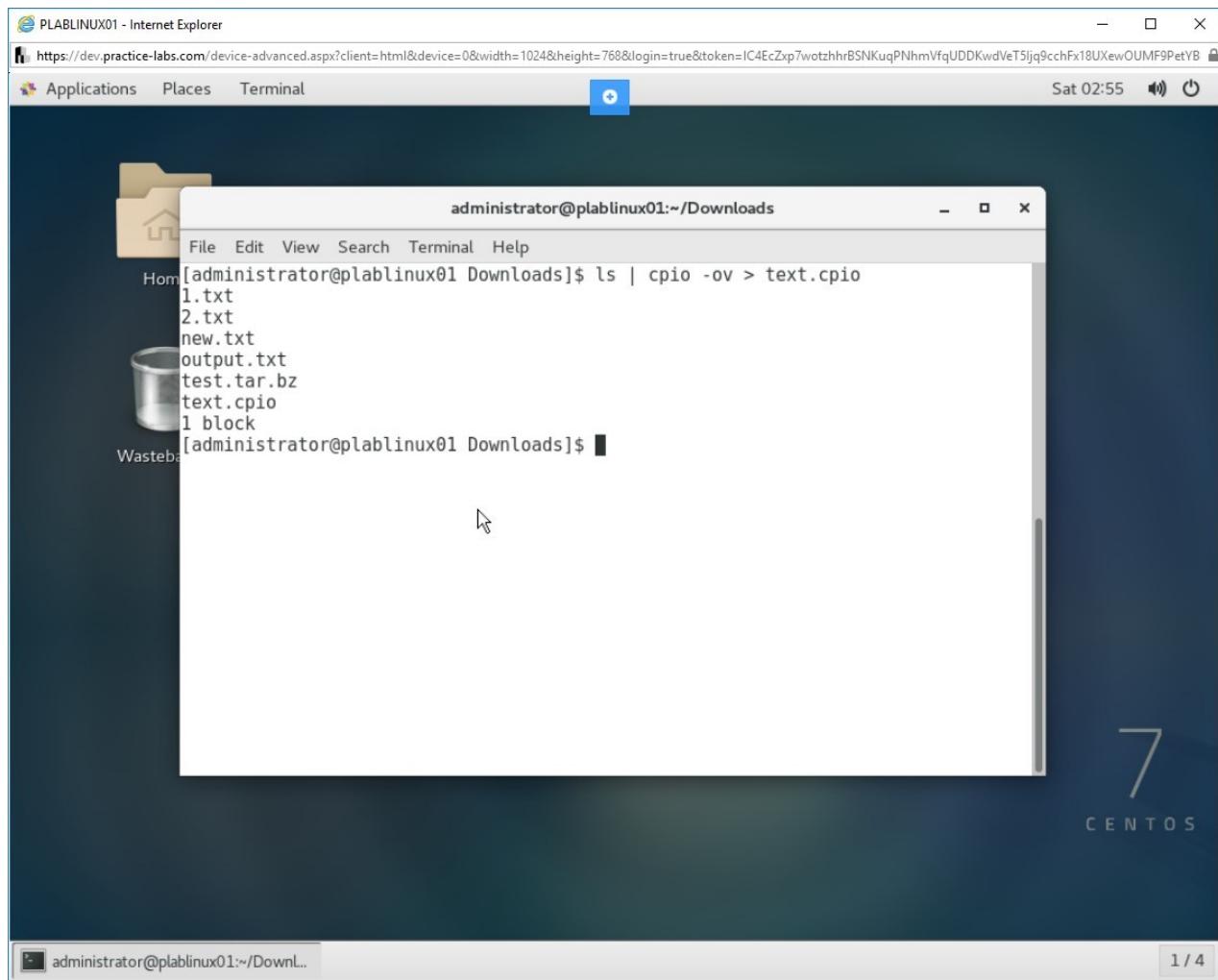


Figure 1.46 Screenshot of PLABLINUX01: Creating an archive file with the cpio command.

Step 9

Create a new directory named **test**. Type the following command:

```
mkdir test
```

Press **Enter**.

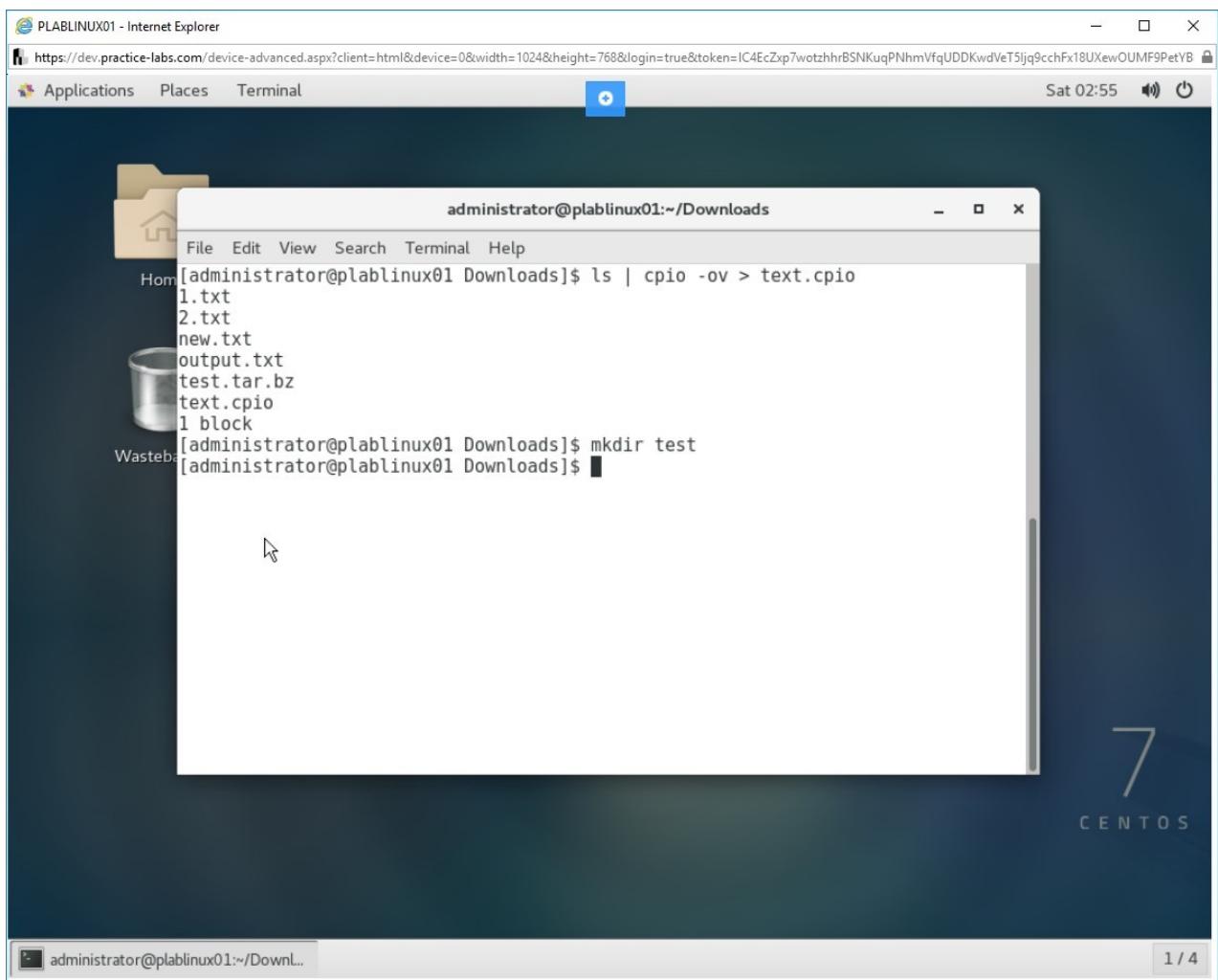


Figure 1.47 Screenshot of PLABLINUX01: Creating a directory named test.

Step 10

Move the **text.cpio** file to the test directory using the following command:

```
mv text.cpio test/
```

To verify that the file has now moved to the **test** directory, type the following command:

```
ls test/
```

Press **Enter**.

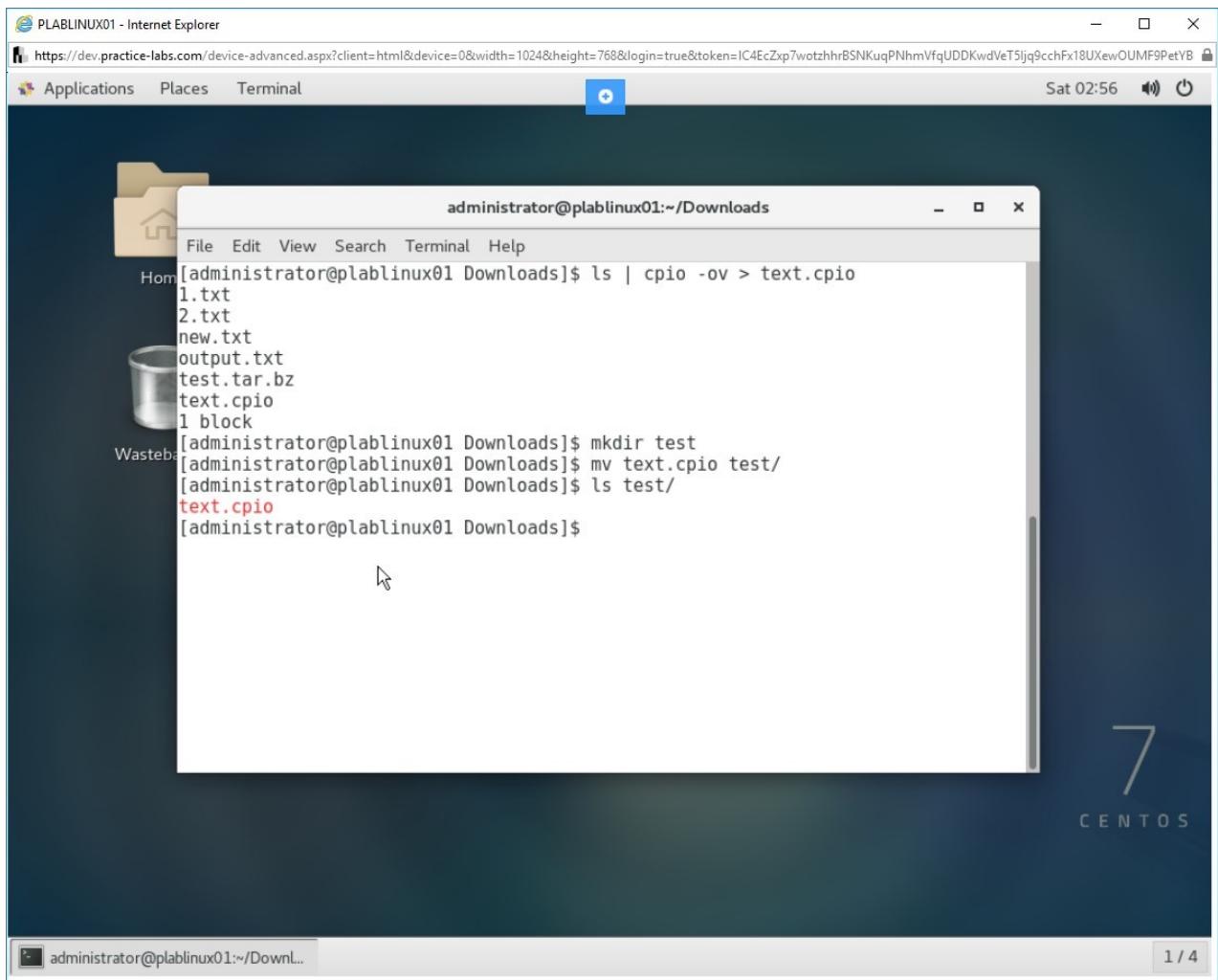


Figure 1.48 Screenshot of PLABLINUX01: Moving the archive file into the test directory and then listing its content.

Step 11

To navigate to the **test** directory, type the following command:

```
cd test
```

Press **Enter**.

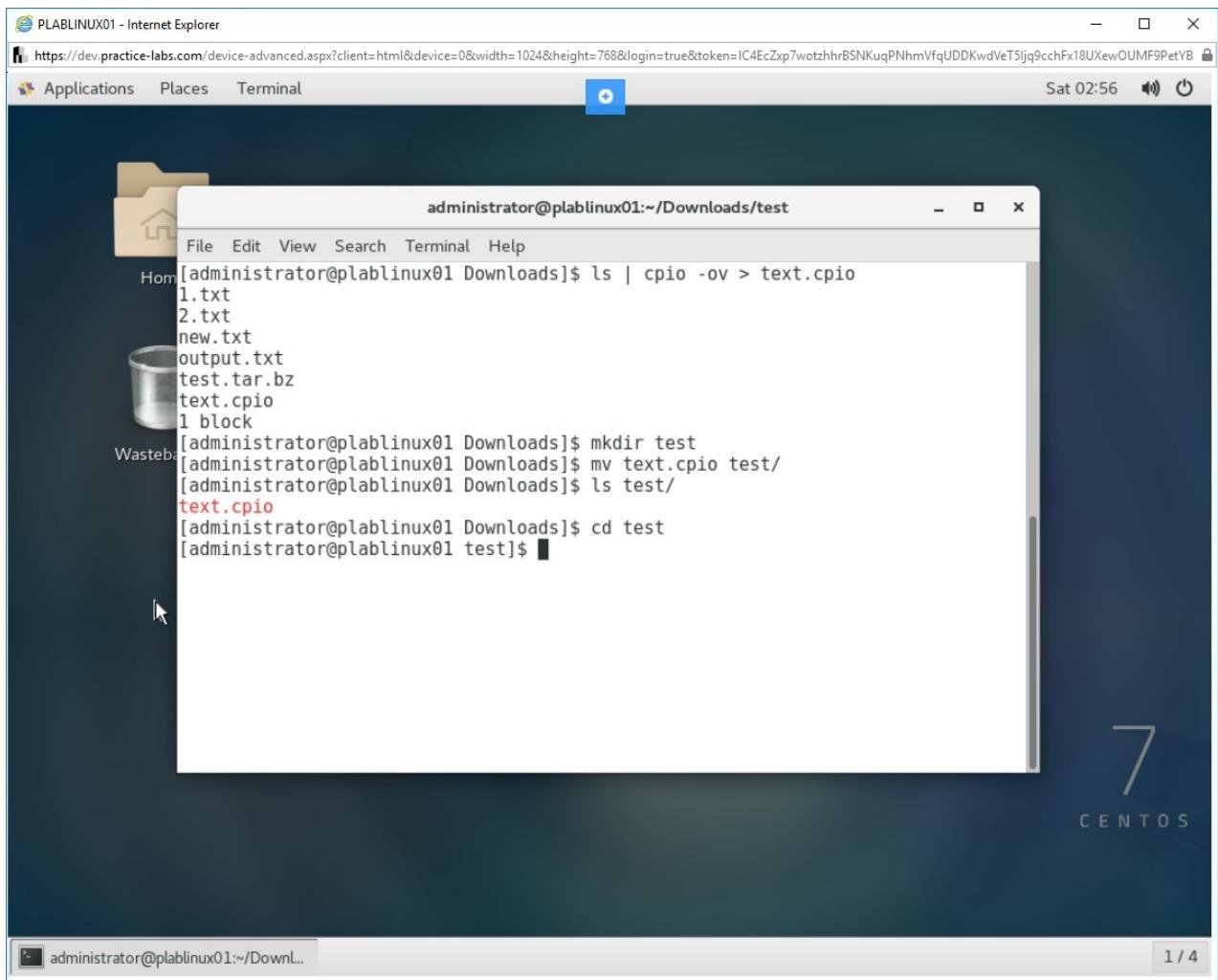


Figure 1.49 Screenshot of PLABLINUX01: Navigating to the test directory.

Step 12

To extract, you need to use the **-iv** switches in place of the **-ov** switches used for creating the archive. The forward director (**>**) is replaced with a backward director (**<**).

To extract the files from a cpio archive, type the following command:

```
cpio -iv < text.cpio
```

Press **Enter**.

Note that if the directory to which you are extracting the cpio archive contains files with the same name as the files within the cpio archive, the files will not be extracted.

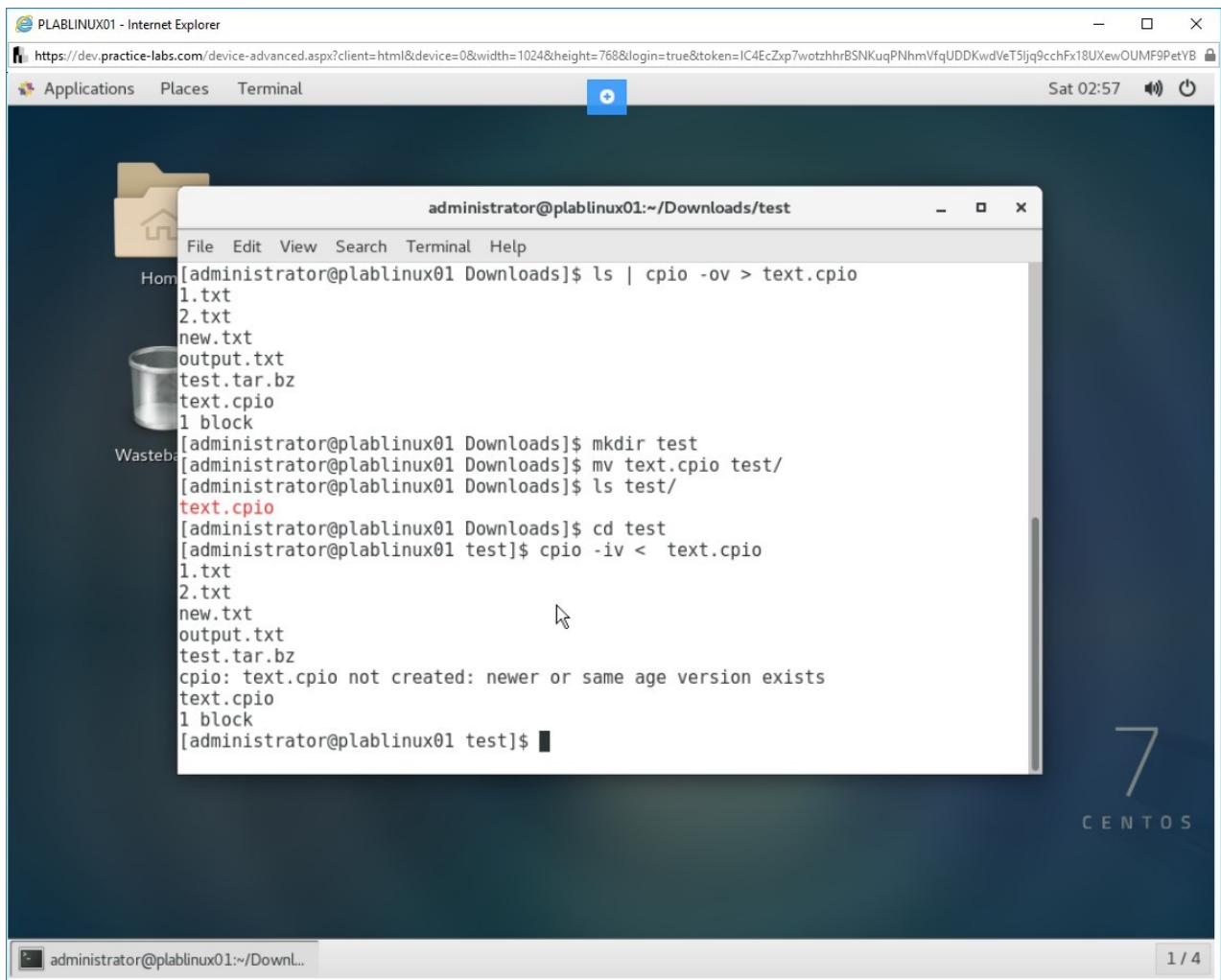


Figure 1.50 Screenshot of PLABLINUX01: Extracting the files from the archive using the cpio command.

Step 13

Clear the screen by entering the following command:

```
clear
```

To list the contents of the directory, type the following command:

```
ls
```

Press **Enter**.

Note that all files have been extracted.

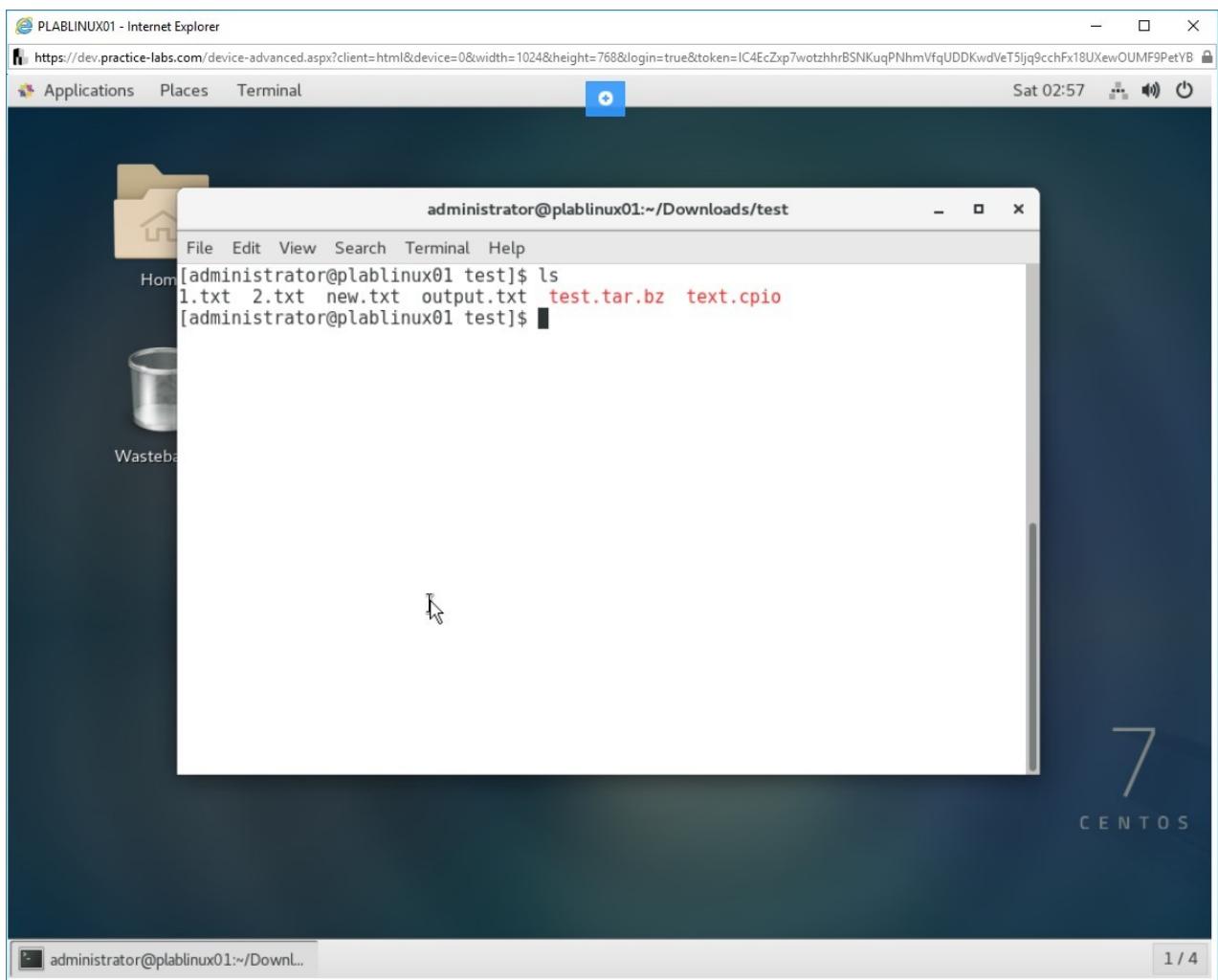


Figure 1.51 Screenshot of PLABLINUX01: Listing the contents of the directory.

Note: The 'cp' and the 'dd' tool can both be used to copy portions of a device. Both these commands preserve the underlying filesystem. However, the 'cp' works only with the data and transfers it from one filesystem to another filesystem.

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

Review

Well done, you have completed the **Perform Basic File Management** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Perform Basic File Management

You should now be able to:

- Perform basic file management
- Use wildcards for advanced file operations
- Use wildcards to manipulate data in a file
- Use the find command
- Use the tar and cpio commands

Feedback

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