CompTIA Linux+

Compress Data Using Various Tools and Utilities

Introduction

Welcome to the **Compress Data Using Various Tools and Utilities** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Compressing
Data
Tools
Utilities

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Compress Data Using Various Tools and Utilities

After completing this lab, you will be able to:

- Use gzip
- Use bzip2
- Use xz
- Use tar with various compression tools

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 108.2 System logging

- **CompTIA:** 3.4 Given a scenario, implement logging services.

> ***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.

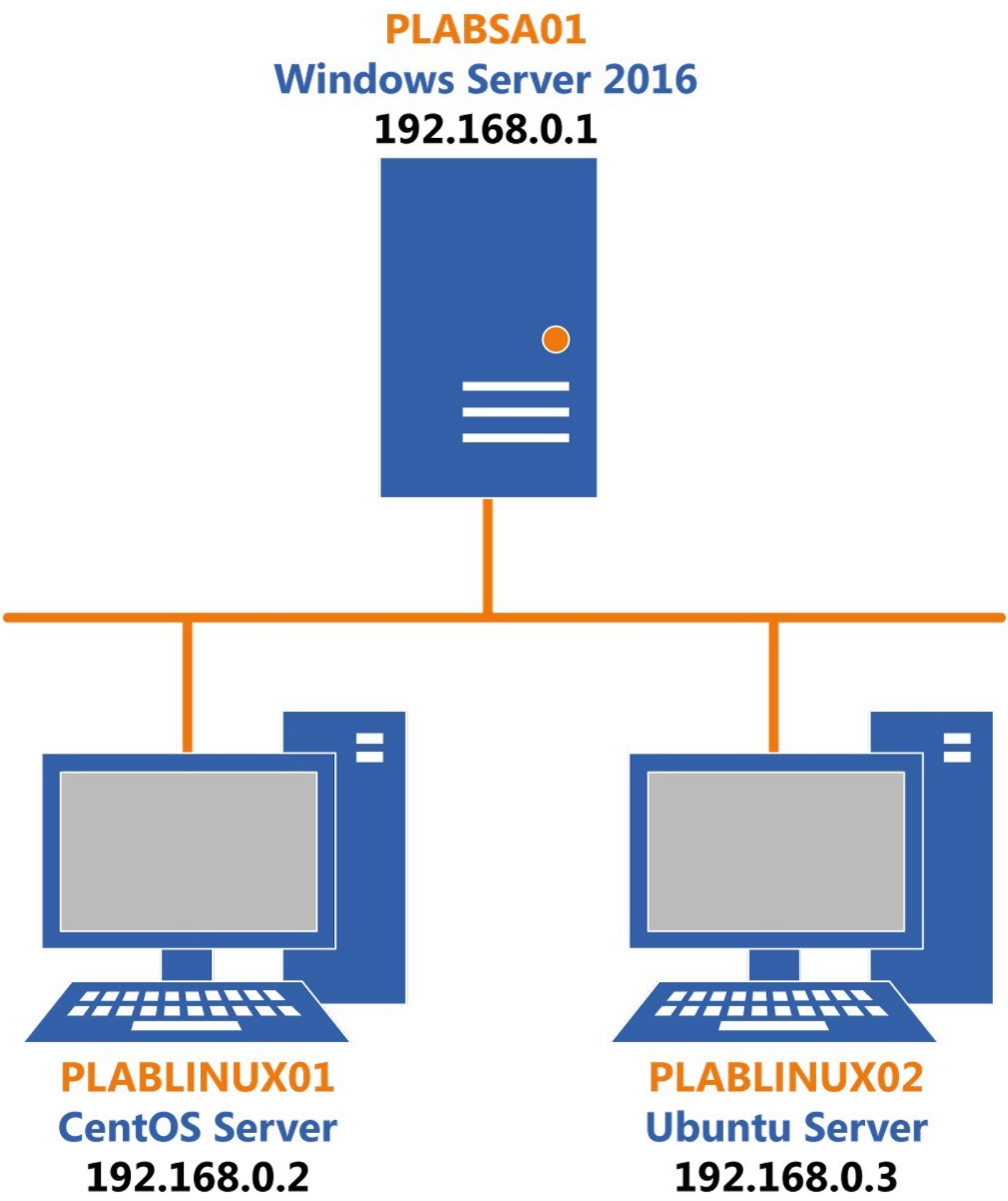
Help and Support

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 - Compress Data Using Various Tools and Utilities

Compression is a method of reducing the file size. There are different algorithms that are available that use different compression methods and mathematical algorithms.

In this exercise, you will compress data using various tools and utilities.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Use gzip
- Use bzip2
- Use xz
- Use tar with various compression tools

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 - Use gzip

The gzip tool is one of the oldest methods of compression in Linux. It uses the DEFLATE algorithm to compress data. The DEFLATE method is also used in other technologies, such as PNG, HTTP, and SSH. The gzip tool uses the .gz extension for the compressed files.

In this task, you will learn to use gzip. To use gzip, perform the following steps:

Step 1

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

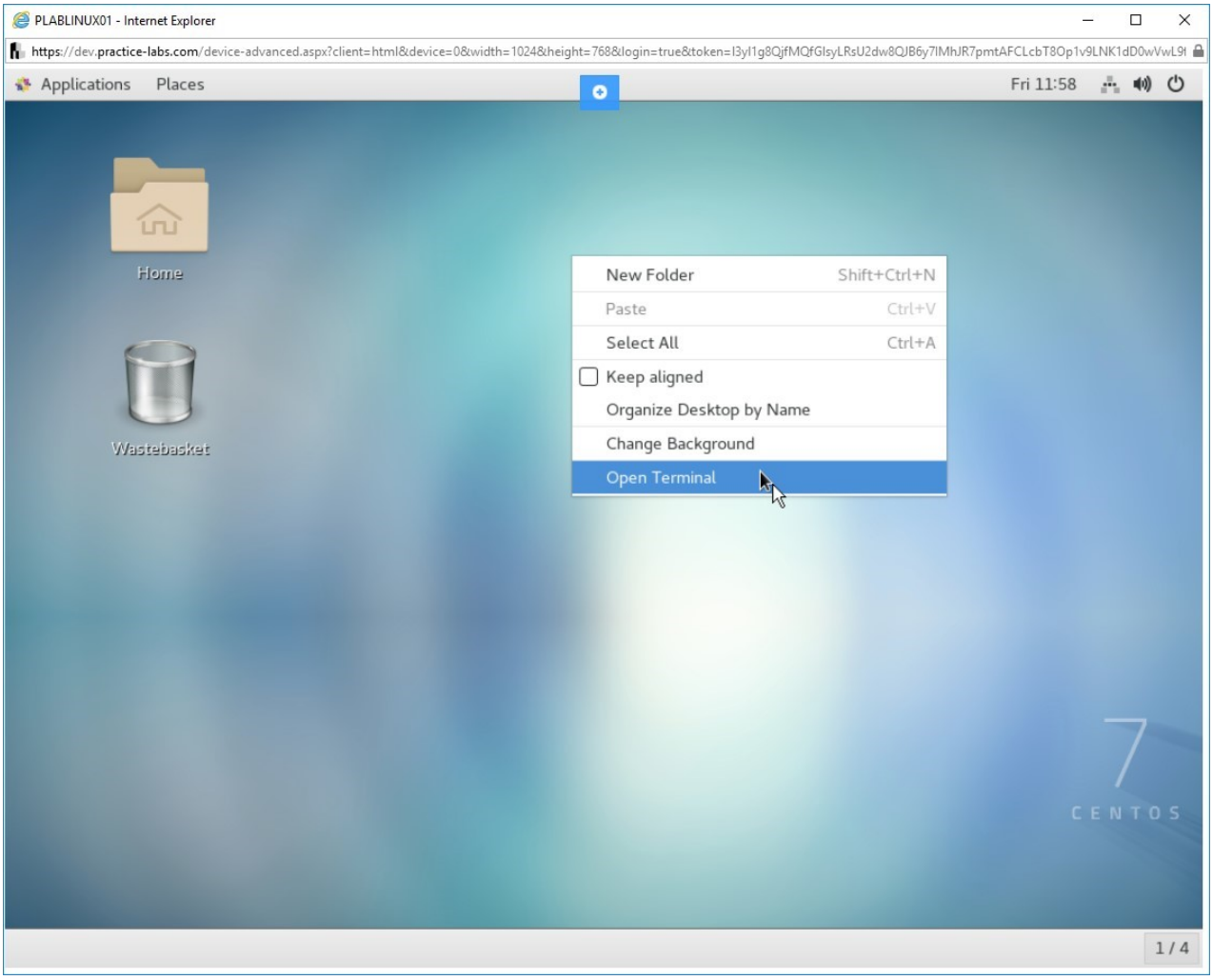


Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

The terminal window is displayed.

Let's first copy the **/etc/hosts** file to the current directory. Type the following command:

```
cp /etc/hosts .
```

Press **Enter**. Notice the **.** (dot). It denotes the current directory.

> ***Note:*** *You can use any file for compression. For the sake of demonstration, this lab uses the /etc/hosts file. You can also create*

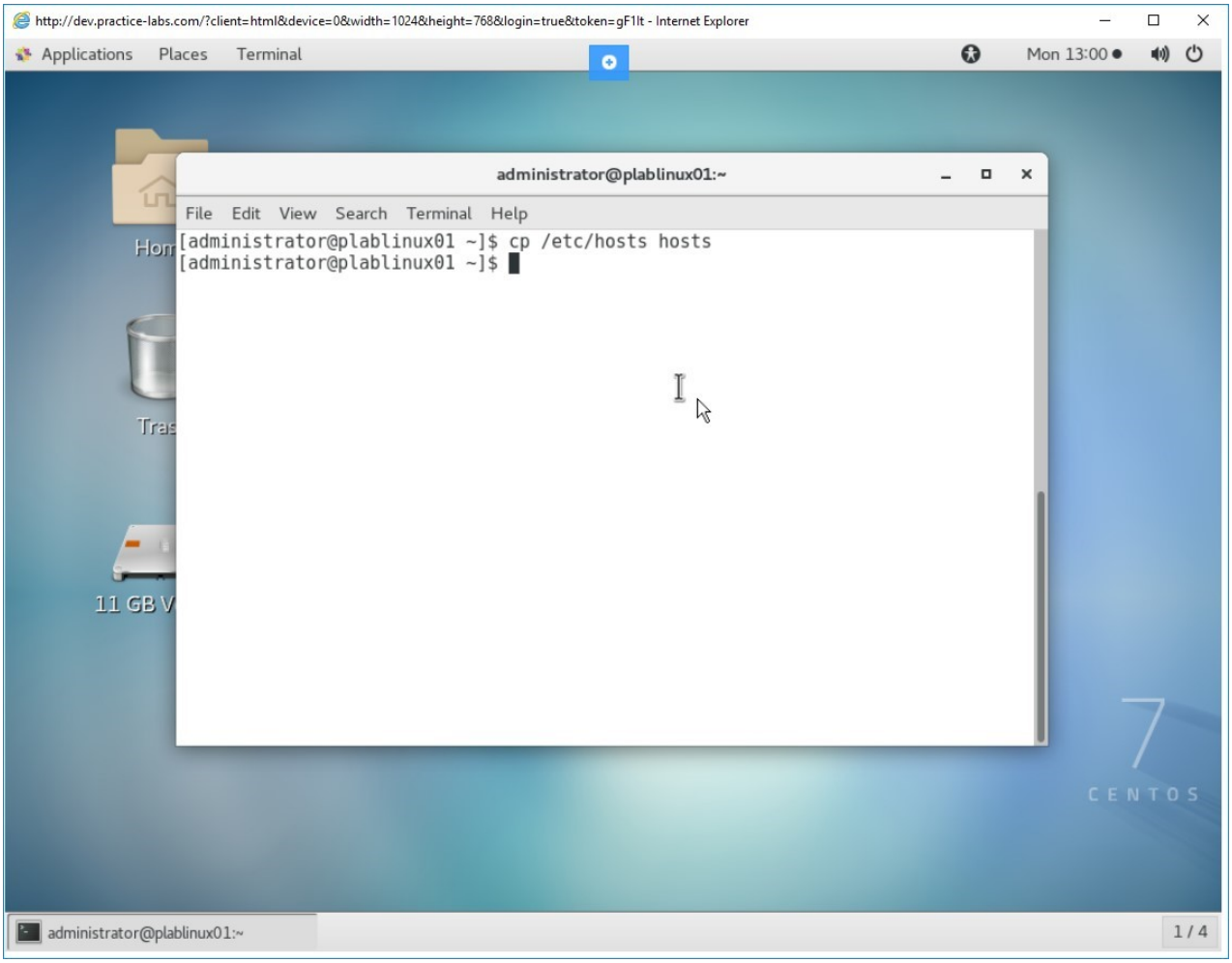


Figure 1.2 Screenshot of PLABLINUX01: Copying the hosts file to the home directory from the /etc directory.

Step 3

To compress the **hosts** file, type the following command:

```
gzip hosts
```

Press **Enter**.

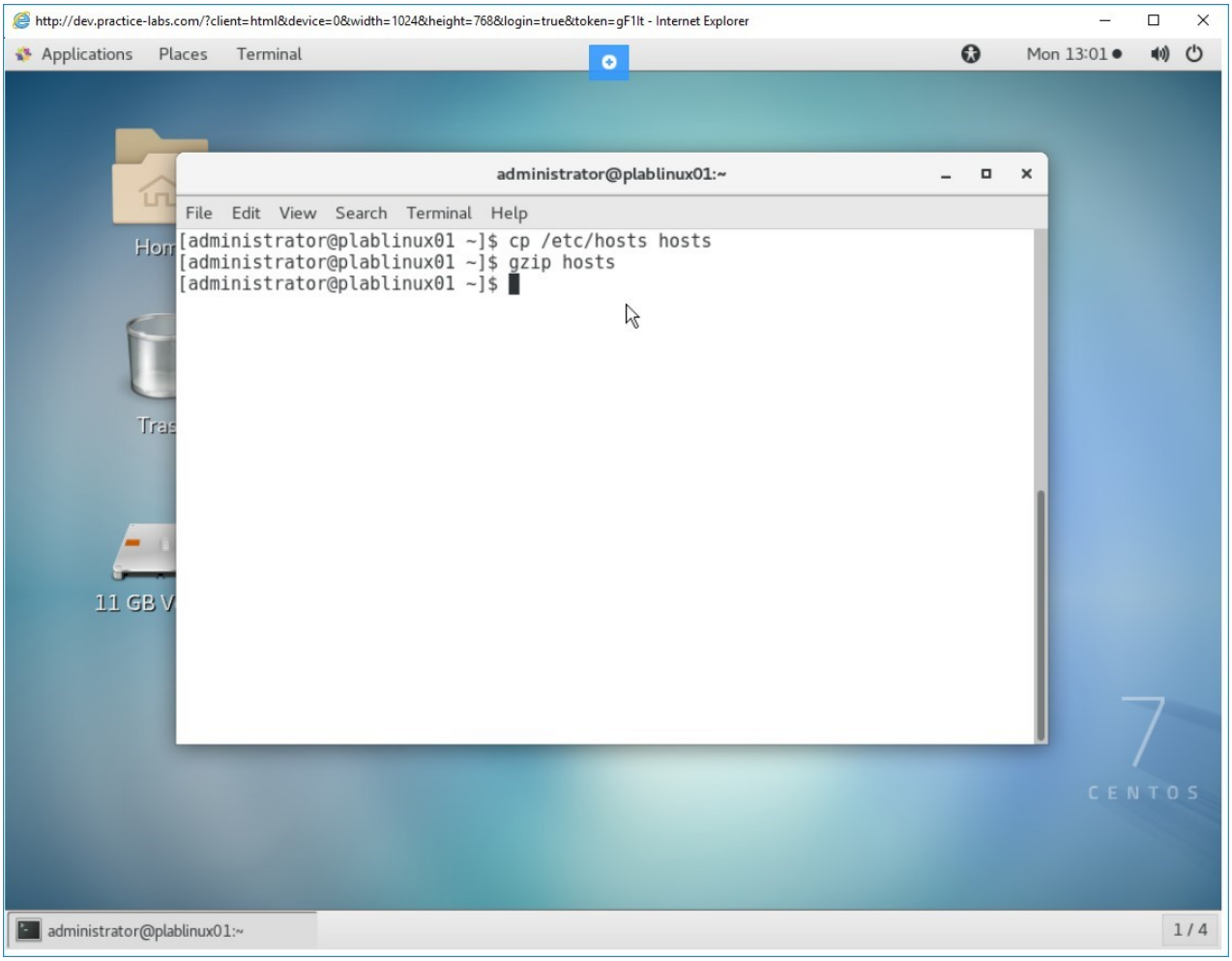


Figure 1.3 Screenshot of PLABLINUX01: Zipping the file using gzip.

Step 4

To verify if the file has been compressed, type the following command:

```
ls
```

Press **Enter**. Notice that the hosts file is no longer present. Instead, the hosts.gz file is now added.

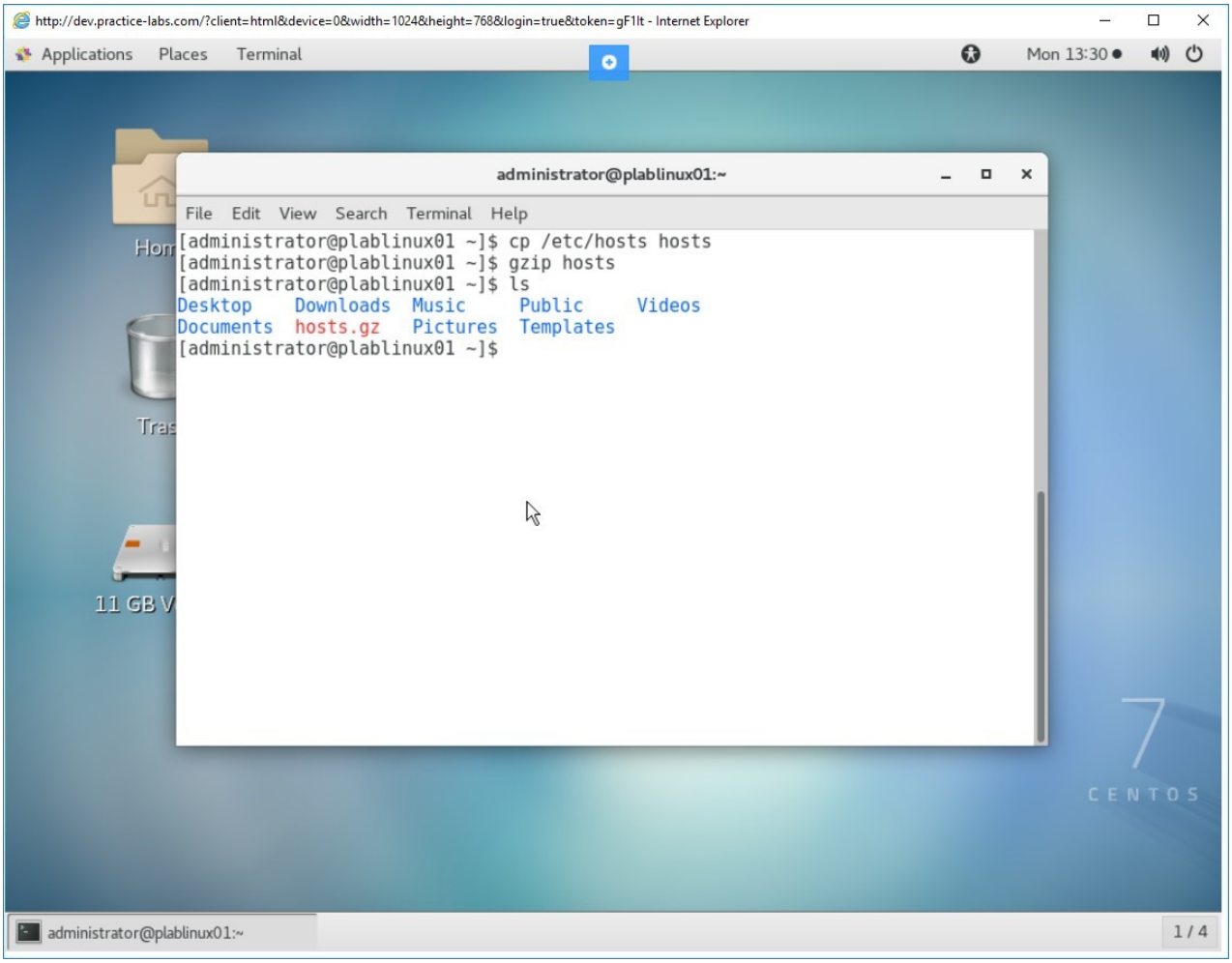


Figure 1.4 Screenshot of PLABLINUX01: Verifying the gzip file.

Step 5

Clear the screen by entering the following command:

```
clear
```

To find information about the compressed file, type the following command:

```
gzip -l hosts.gz
```

Press **Enter**.

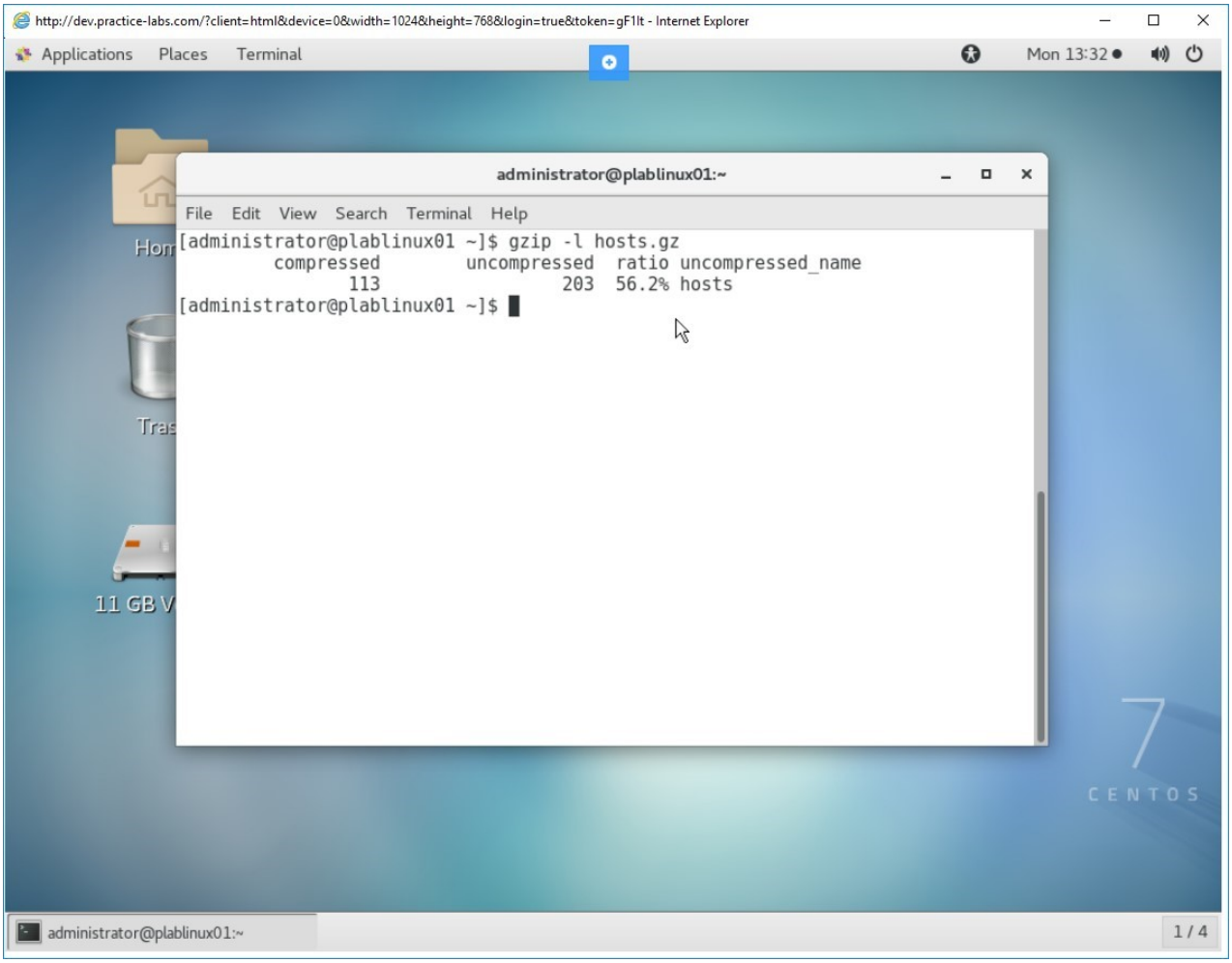


Figure 1.5 Screenshot of PLABLINUX01: Finding information about the compressed file.

Step 6

To decompress the file, type the following command:

```
gzip -d hosts.gz
```

Press **Enter**.

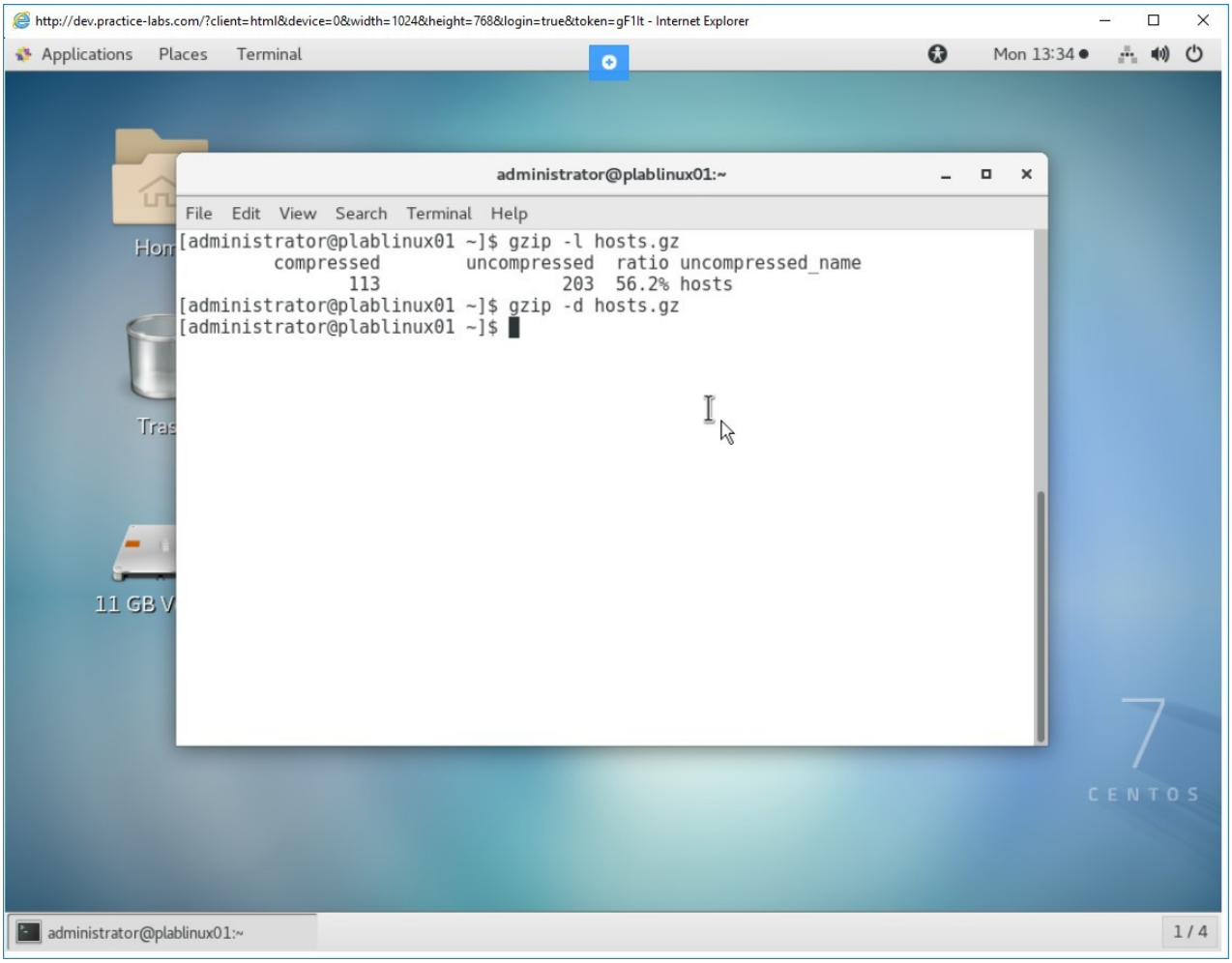


Figure 1.6 Screenshot of PLABLINUX01: Decompressing the gzip file.

Step 7

To verify if the file has been decompressed, type the following command:

```
ls
```

Press **Enter**. Notice that the **hosts.gz** file is no longer present. Instead, the **hosts** file is now added.

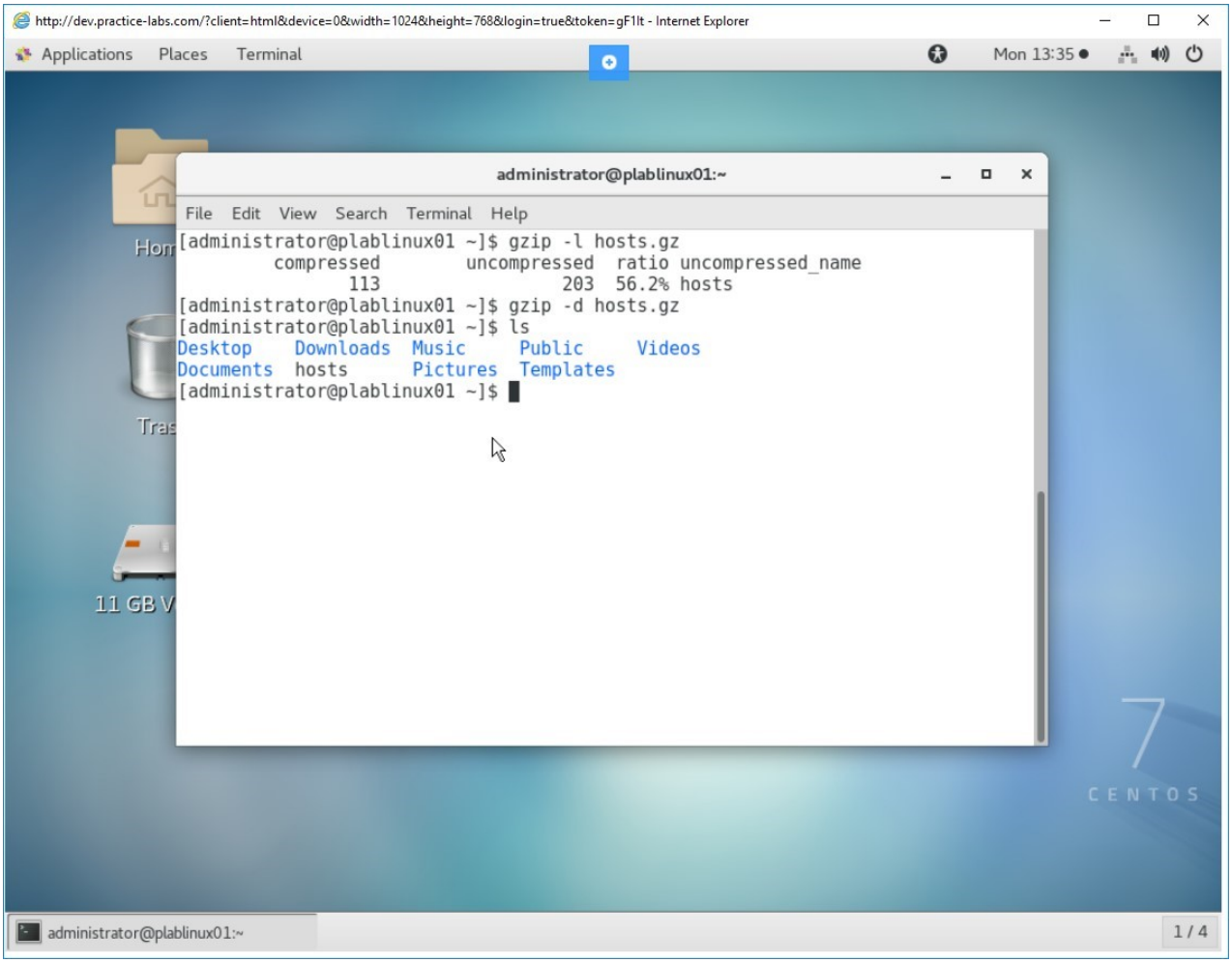


Figure 1.7 Screenshot of PLABLINUX01: Listing the files in the home directory.

Step 8

Clear the screen by entering the following command:

```
clear
```

You can also control the level of compression that you want to apply. The **-1** parameter provides the least amount of compression but is very fast. The **-9** parameter provides the highest compression but is slowest. To use the highest compression, type the following command:

```
gzip -9 hosts
```

Press **Enter**.

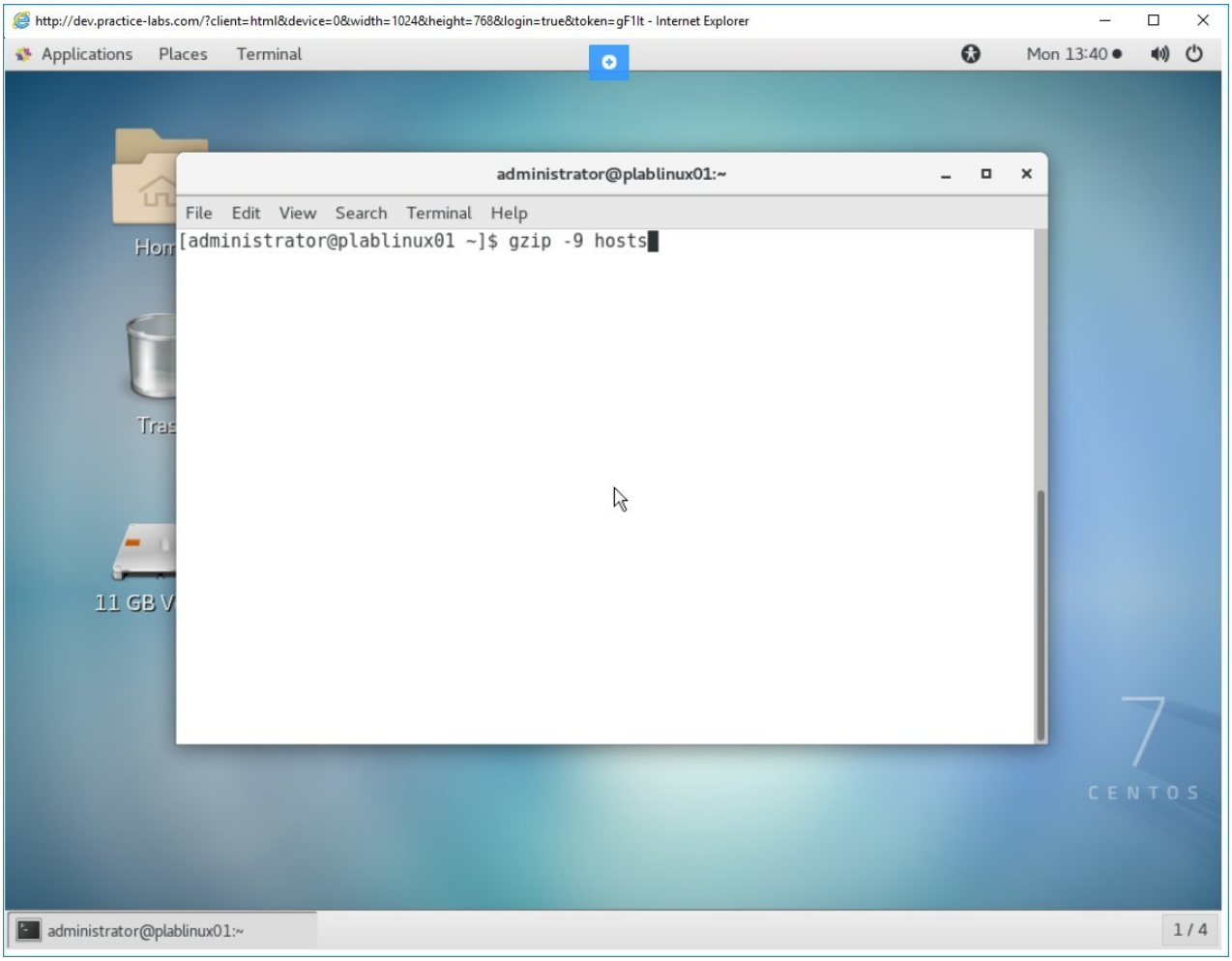


Figure 1.8 Screenshot of PLABLINUX01: Applying the highest compression using gzip.

Step 9

To find information about the compressed file, type the following command:

```
gzip -l hosts.gz
```

Press **Enter**.

> ***Note:*** *Since the hosts file does not hold a large amount of data, you will notice that the compression ratio is similar to when you did not use -9 parameter. This parameter will be good to use when you have a file or directory with a large amount of data.*

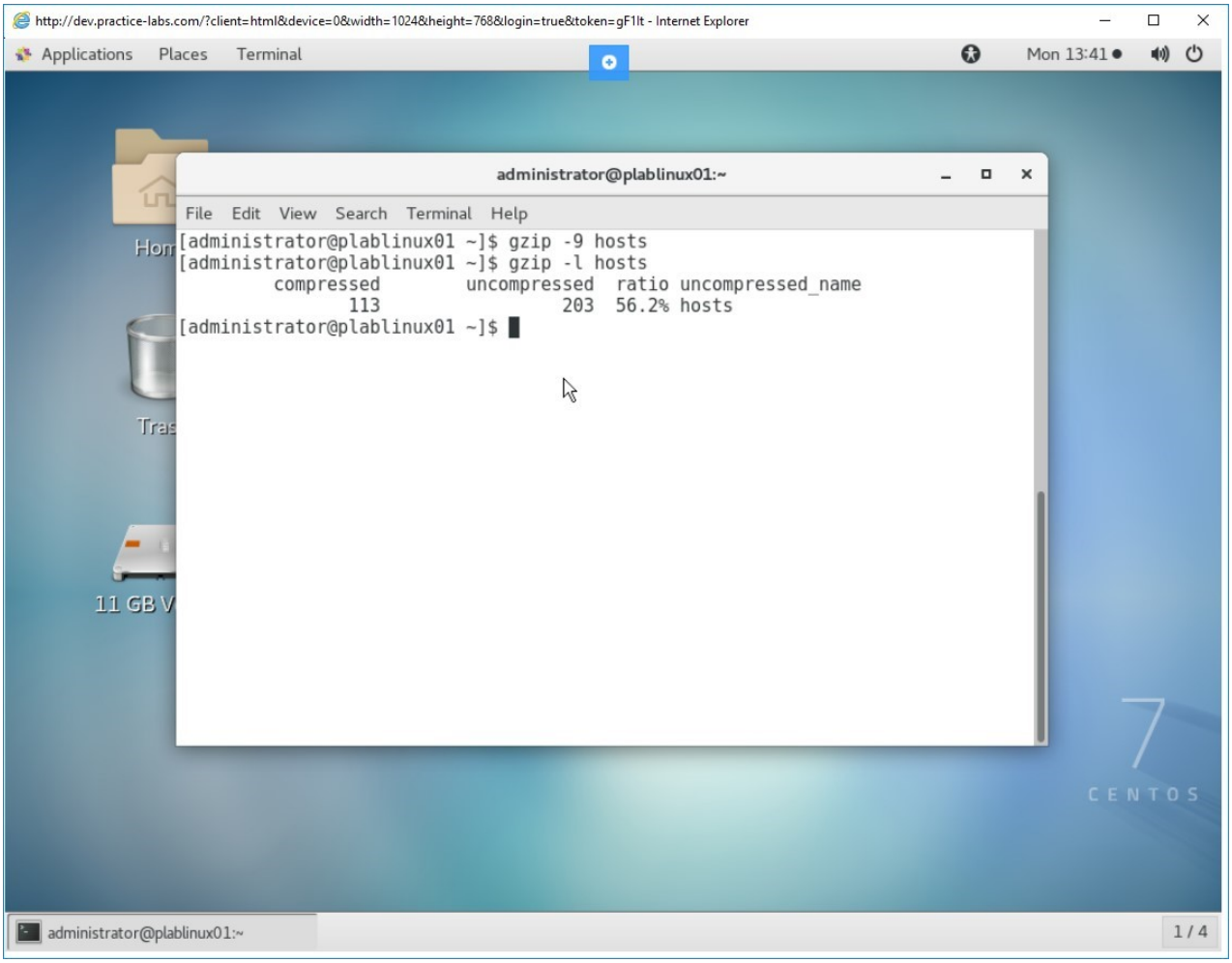


Figure 1.9 Screenshot of PLABLINUX01: Finding information about the compressed file.

Task 2 - Use bzip2

Like gzip, bzip2 is another popular tool for compressing files. It uses the Burrows-Wheeler algorithm that can create heavily compressed files.

In this task, you will use bzip2.

To use bzip2, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Before proceeding to use **bzip2**, let's first extract the hosts file from the **hosts.gz**. To do this, type the following command:

```
gzip -d hosts.gz
```

Press **Enter**.

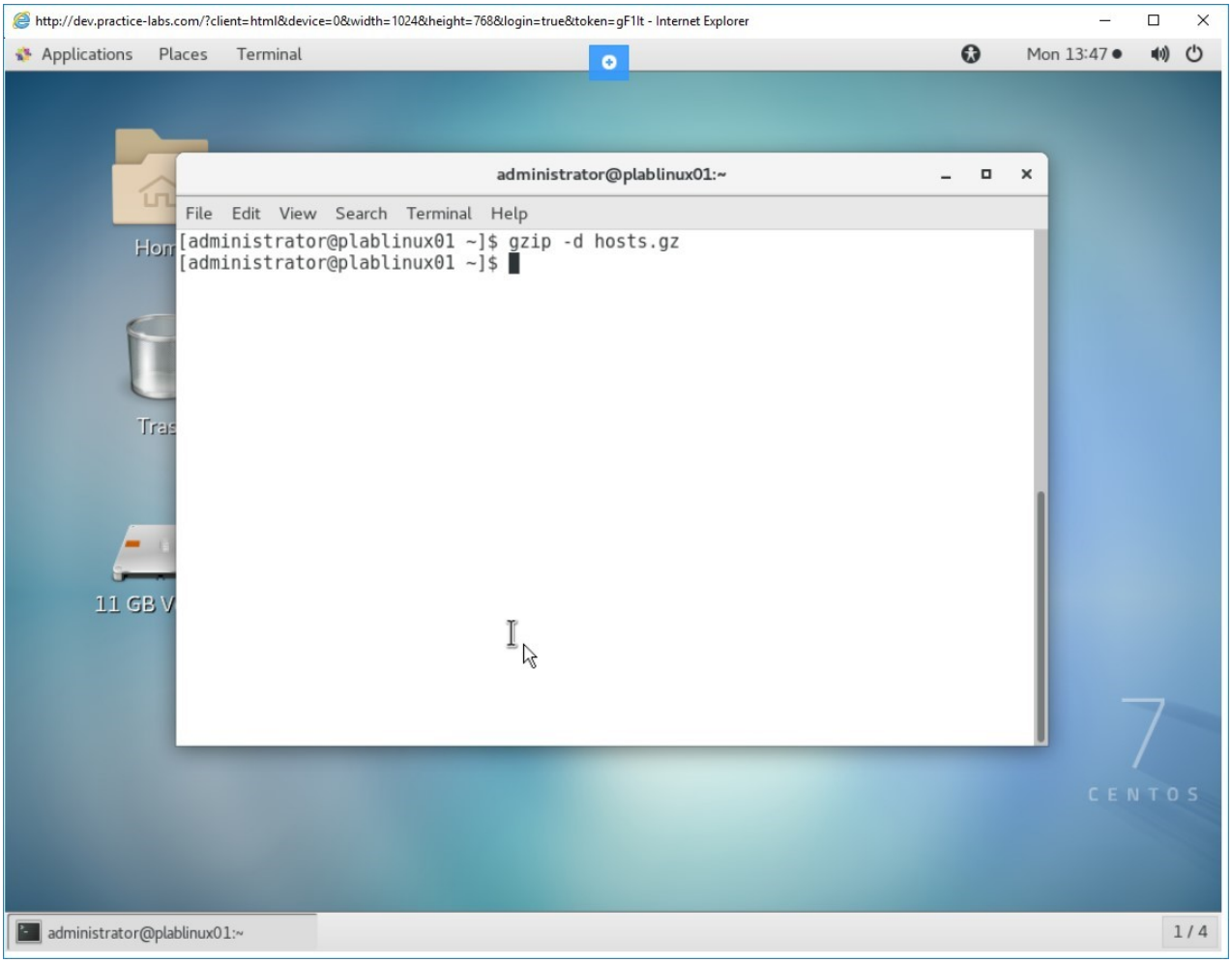


Figure 1.10 Screenshot of PLABLINUX01: Extracting the file using gzip.

Step 2

Clear the screen by entering the following command:

```
clear
```

Before proceeding to use **bzip2**, let's first extract the hosts file from the **hosts.bz2**. To do this, type the following command:

```
bzip2 hosts
```

Press **Enter**.

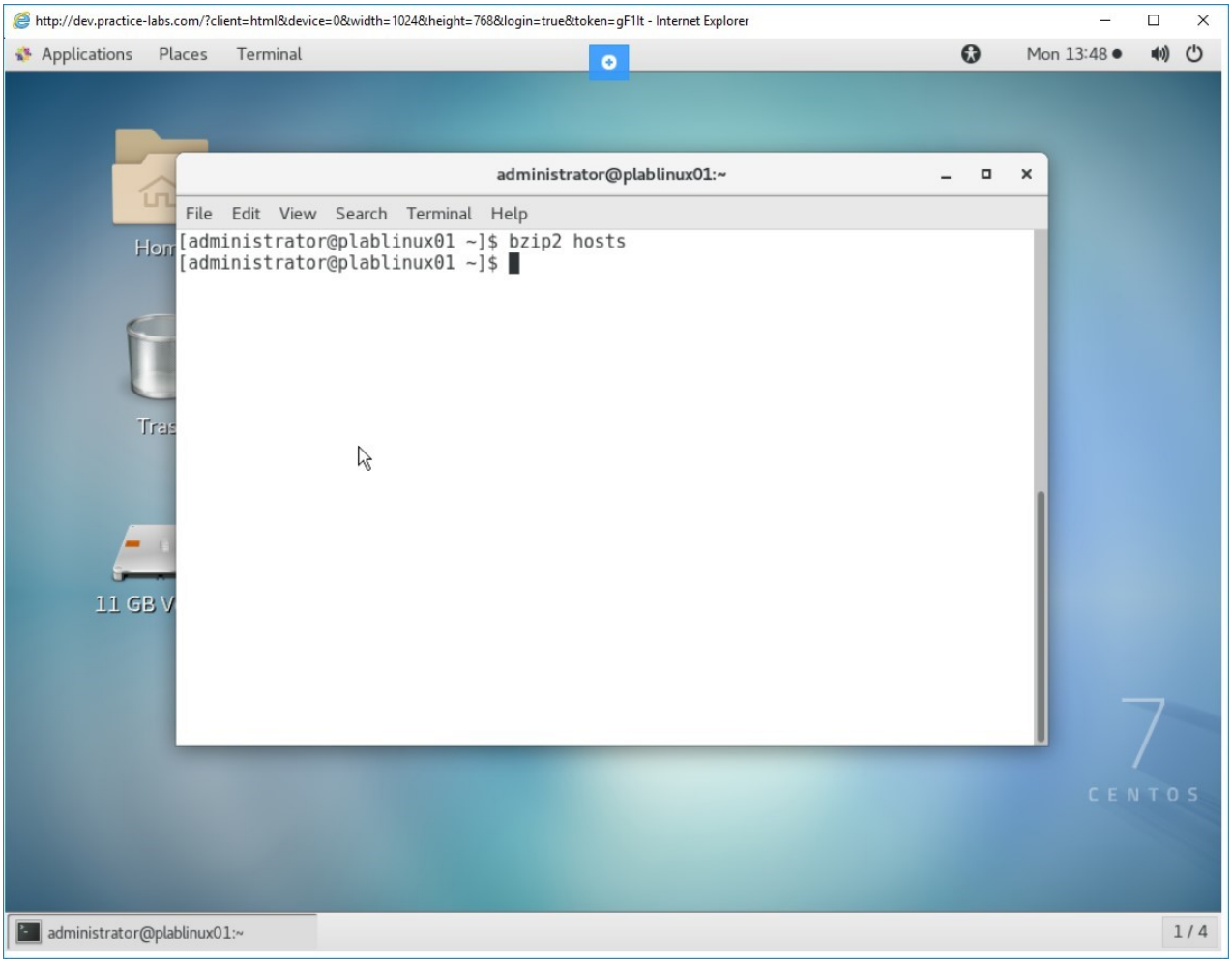


Figure 1.11 Screenshot of PLABLINUX01: Compressing the hosts file using bzip2.

Step 3

To verify if the file has been compressed, type the following command:

```
ls
```

Press **Enter**. Notice that the **hosts.bz2** file is present. Instead, the **hosts** file is no longer present.

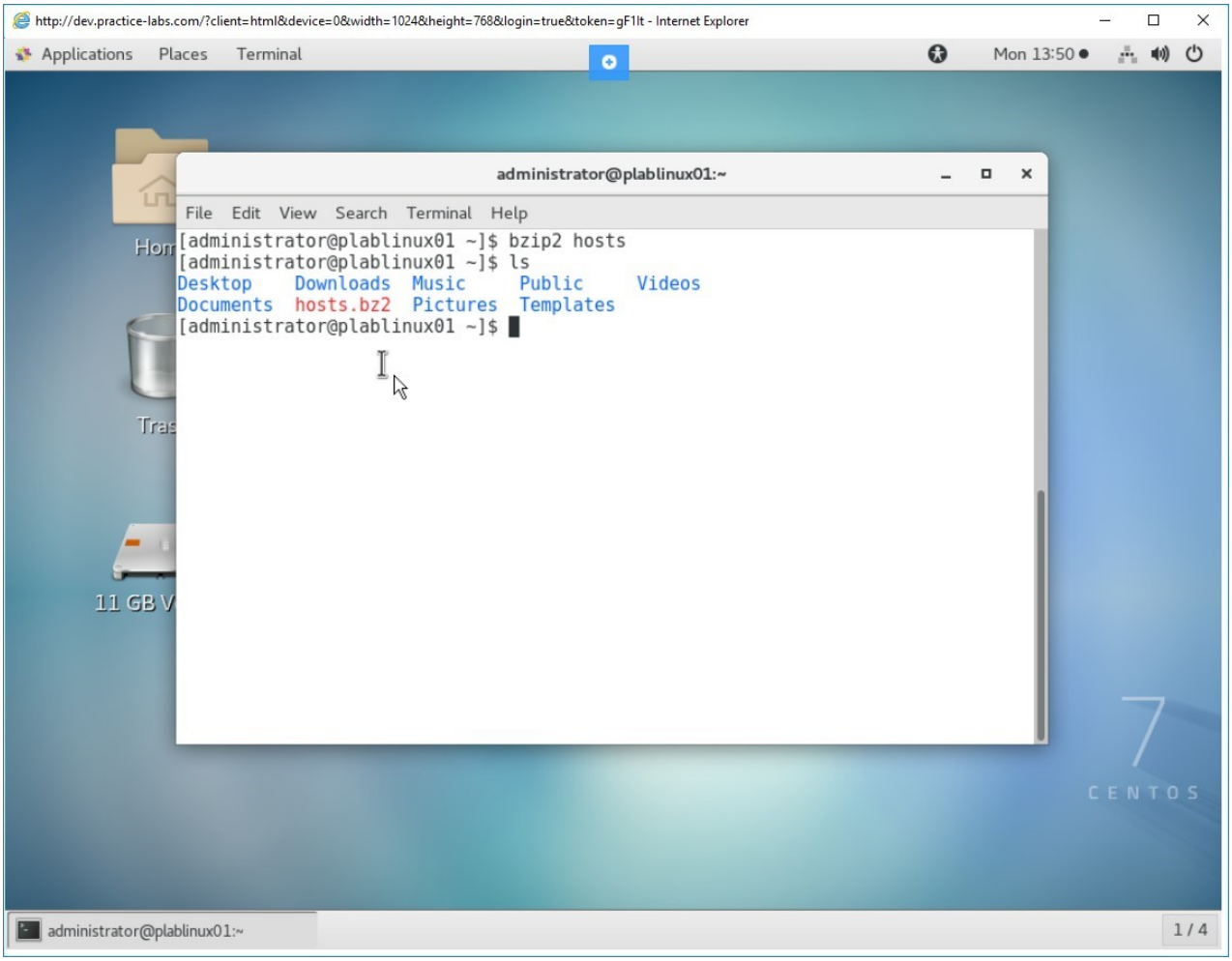


Figure 1.12 Screenshot of PLABLINUX01: Listing the files in the home directory.

Step 4

To decompress the file, type the following command:

```
bzip2 -d hosts.bz2
```

Press **Enter**.

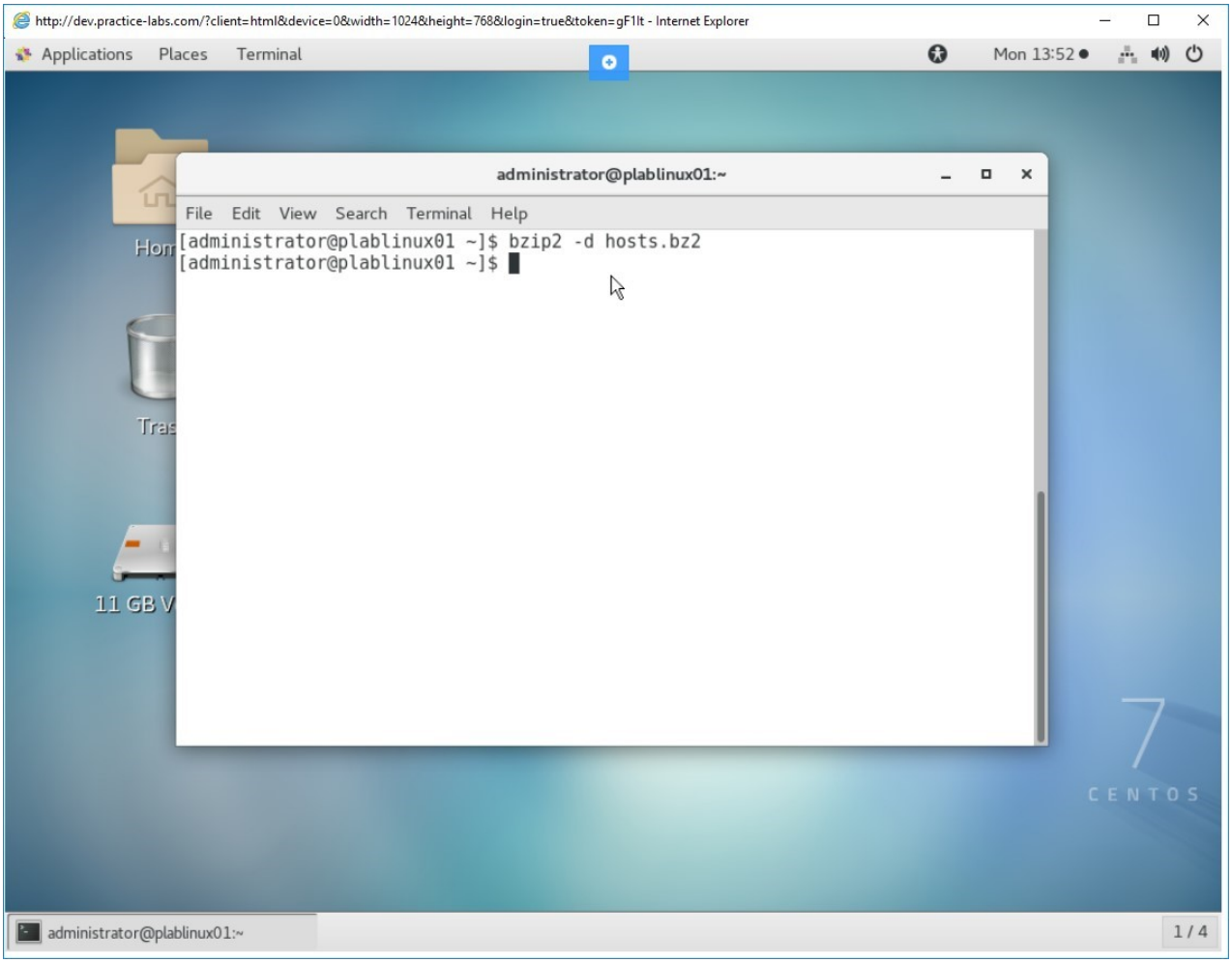


Figure 1.13 Screenshot of PLABLINUX01: Decompressing the compressed file using bzip2.

Step 5

To verify if the file has been decompressed, type the following command:

```
ls
```

Press **Enter**. Notice that the **hosts** file is present. Instead, the **hosts.bz2** file is no longer present.

Note: *Just like gzip, bzip2 can also use the -1 and -9 parameters.*

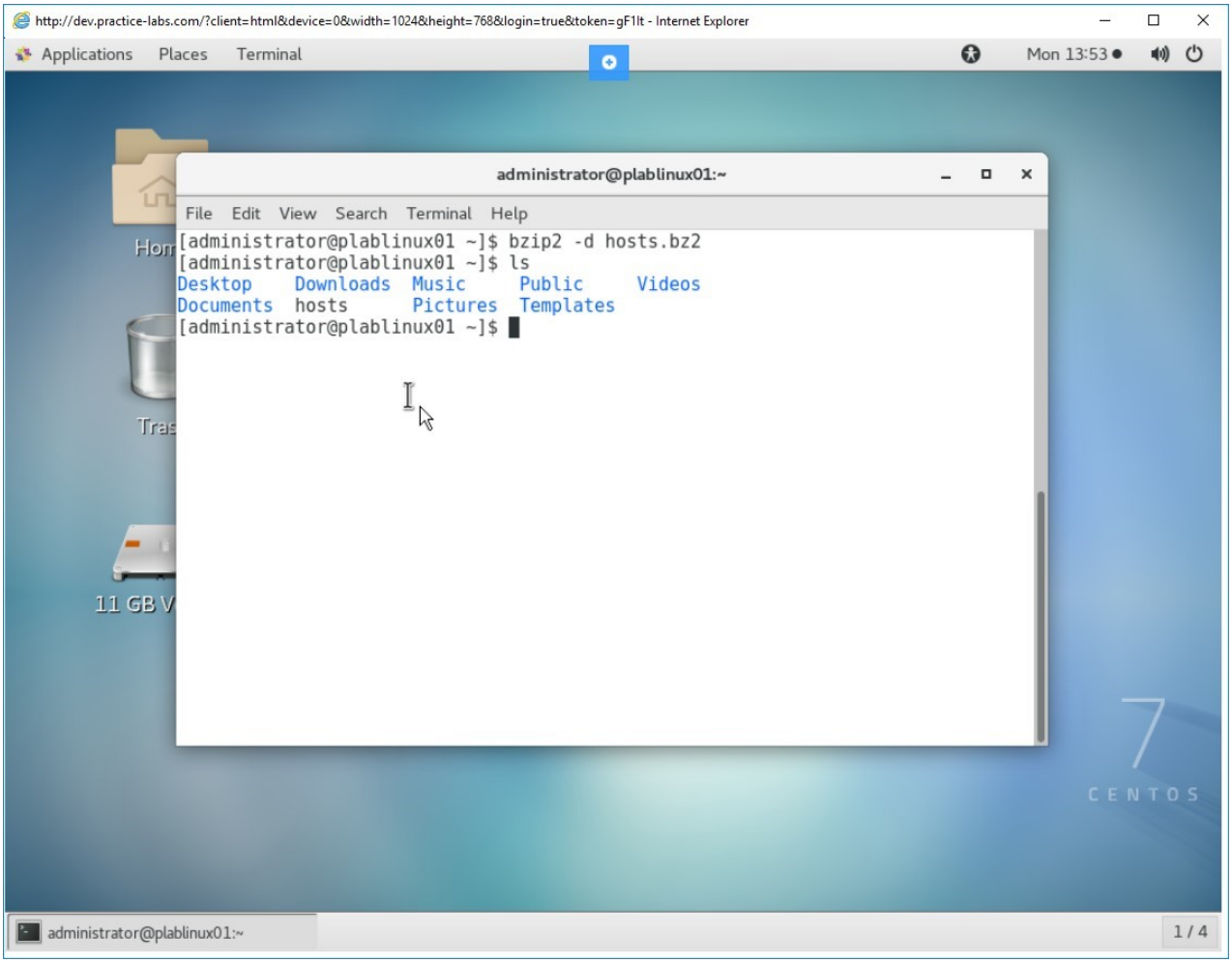


Figure 1.14 Screenshot of PLABLINUX01: Listing the files in the home directory.

Task 3 - Use xz

The xz tool uses the LZMA2 compression and provides better compression than bzip2 and gzip. Even though its compression time is longer, the decompression time is relatively less.

In this task, you will use xz.

To use xz, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

To compress the hosts file, type the following command:

```
xz hosts
```

Press **Enter**.

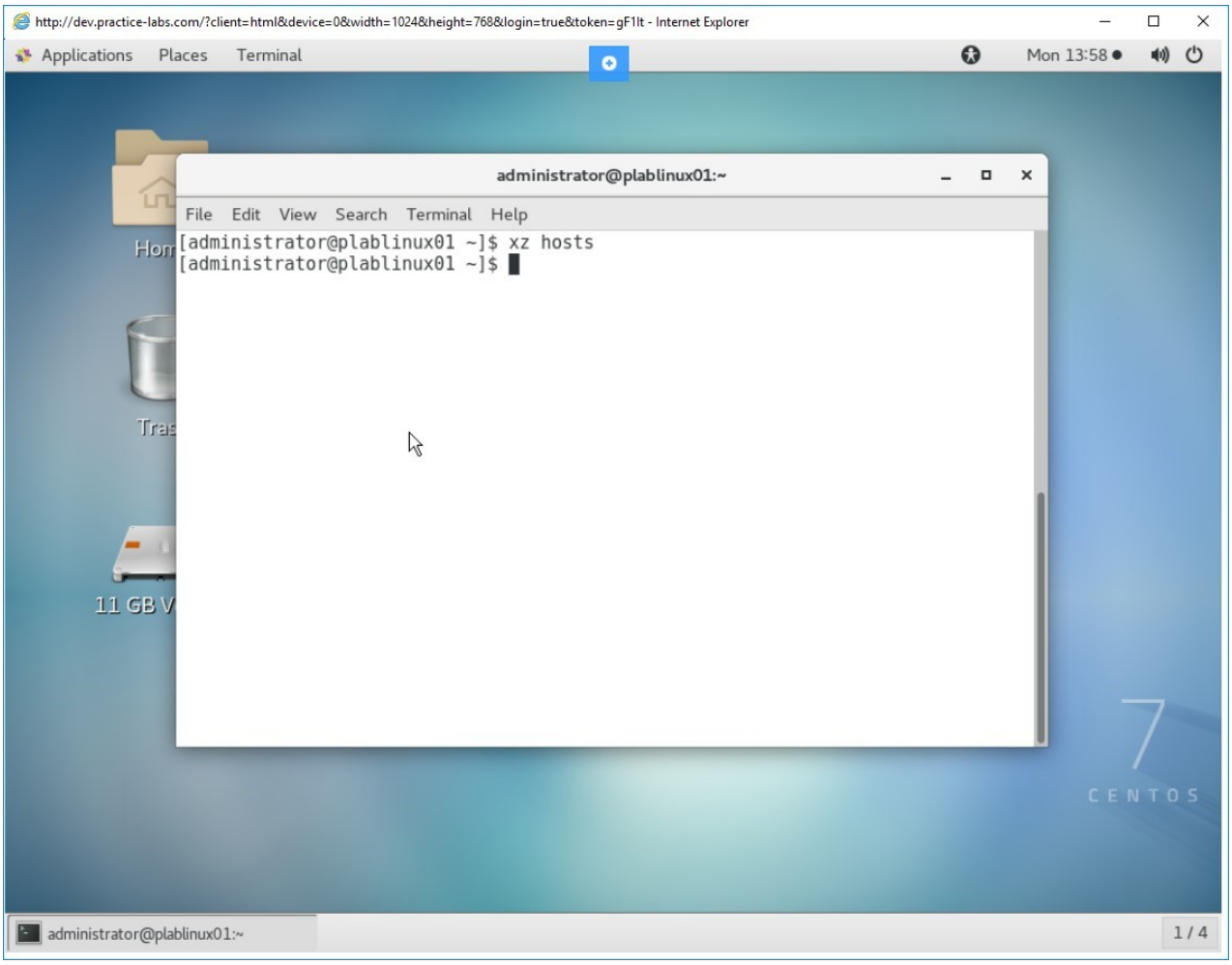


Figure 1.15 Screenshot of PLABLINUX01: Compressing the hosts file using xz.

Step 2

To verify that the hosts file is now compressed, type the following command:

```
ls
```

Press **Enter**. Notice the **hosts.xz** file is now present.

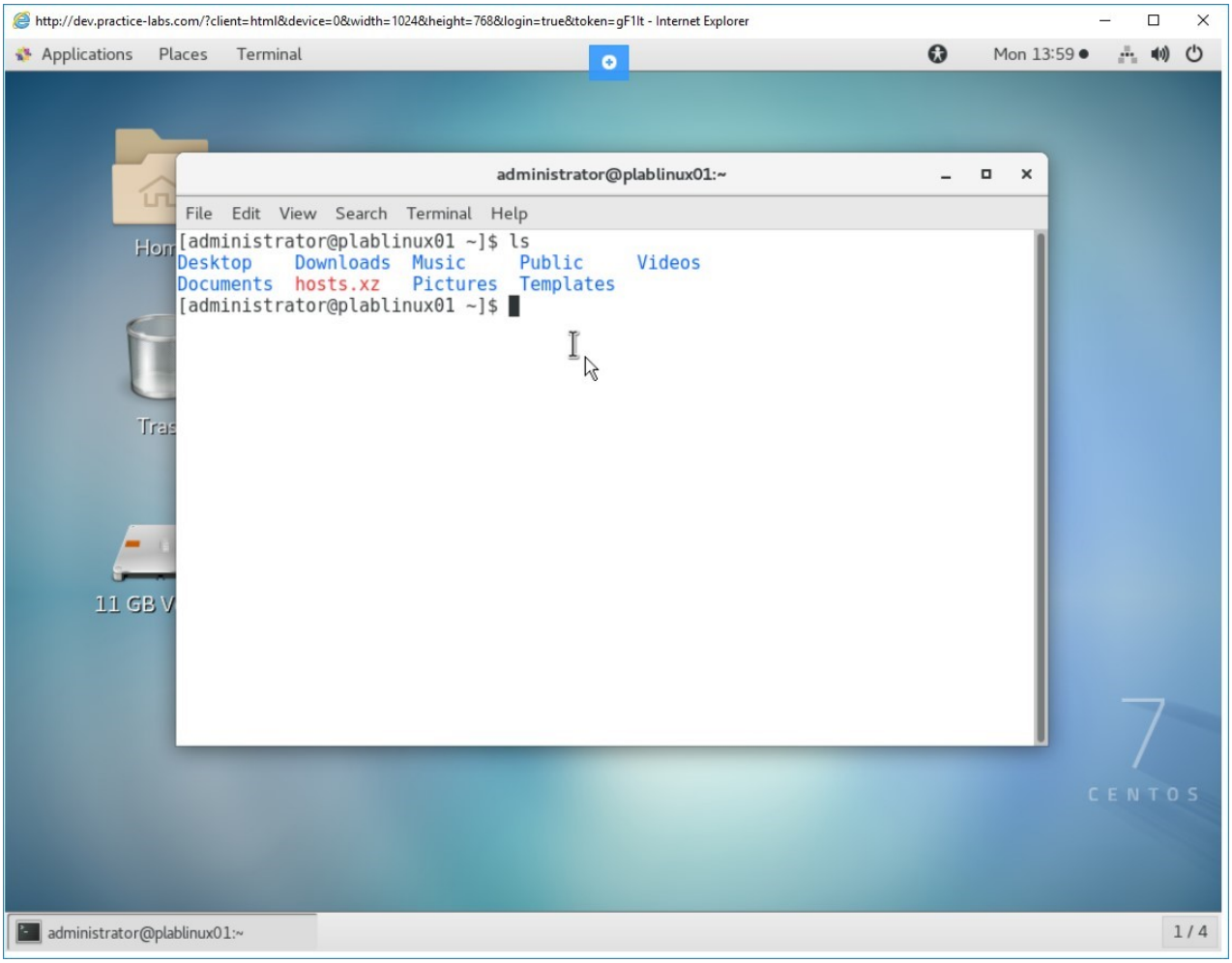


Figure 1.16 Screenshot of PLABLINUX01: Listing the files in the home directory.

Step 3

To view the statistics of the compressed file, type the following command:

```
xz -l hosts.xz
```

Press **Enter**. Notice the hosts.xz file is now present.

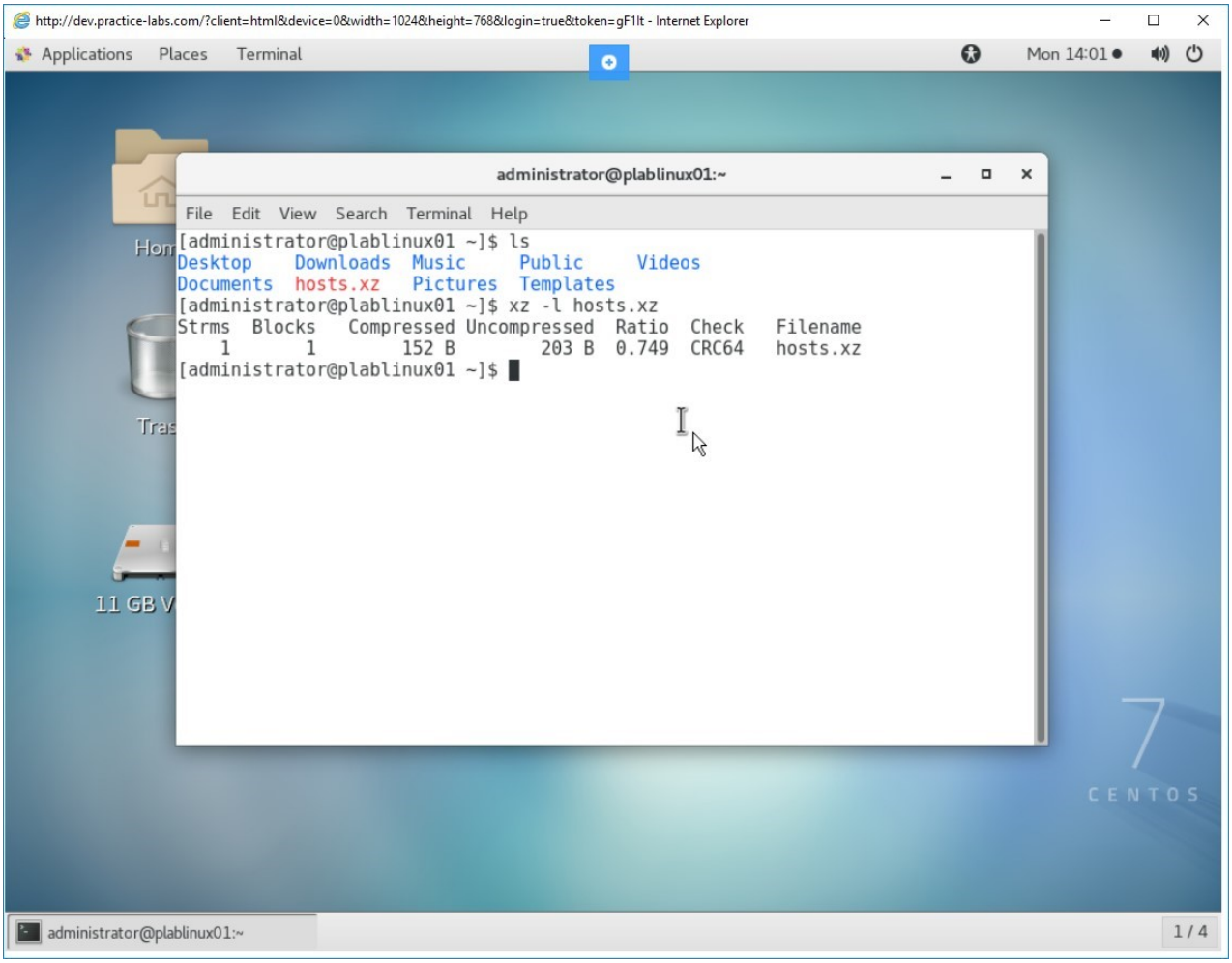


Figure 1.17 Screenshot of PLABLINUX01: Viewing the hosts.xz file statistics.

Step 4

To decompress the compressed file, type the following command:

```
xz -d hosts.xz
```

Press **Enter**.

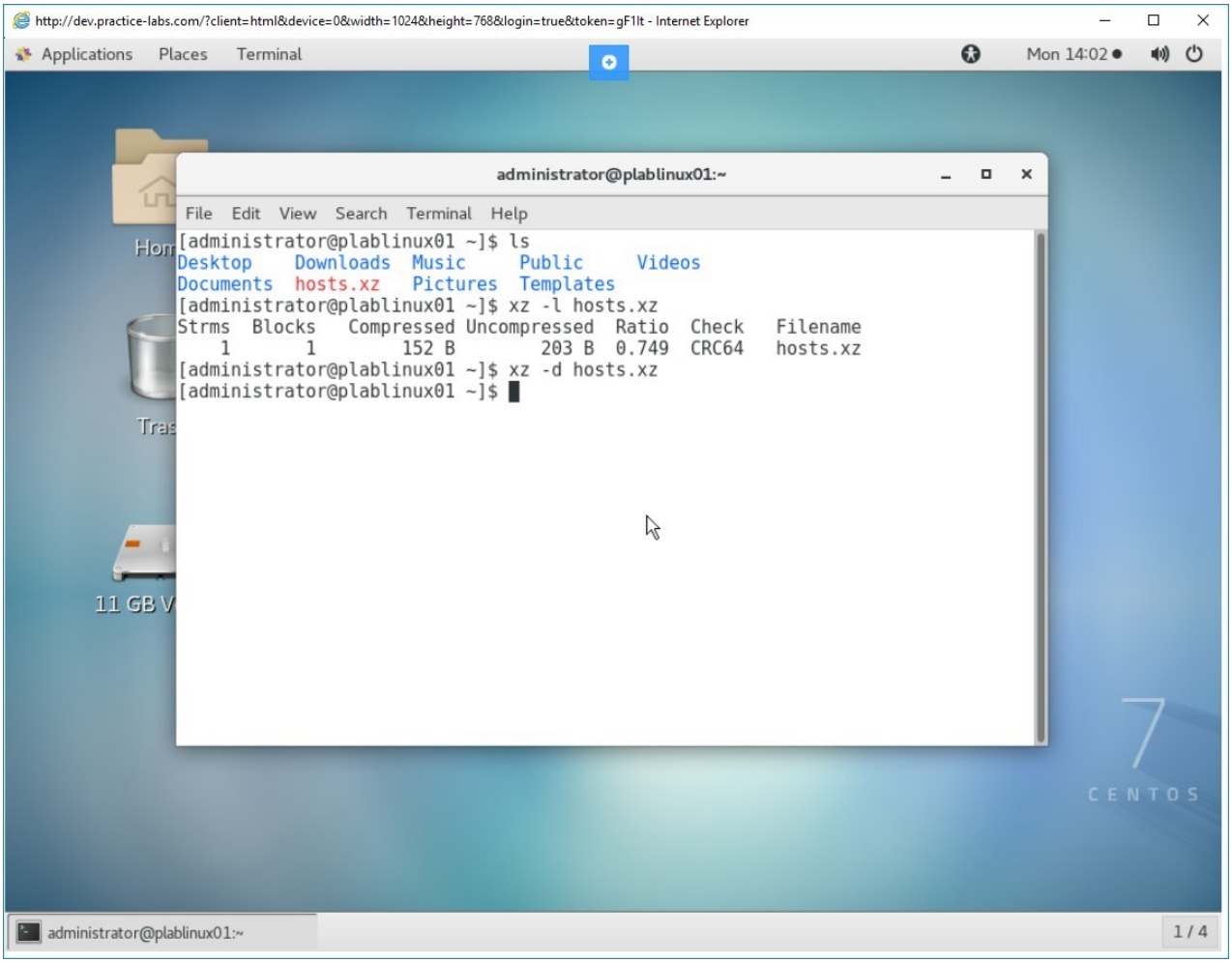


Figure 1.18 Screenshot of PLABLINUX01: Decompressing the file using xz.

Step 5

Clear the screen by entering the following command:

```
clear
```

To verify that the file has been decompressed, type the following command:

```
ls
```

Press **Enter**. Notice the hosts file is now present.

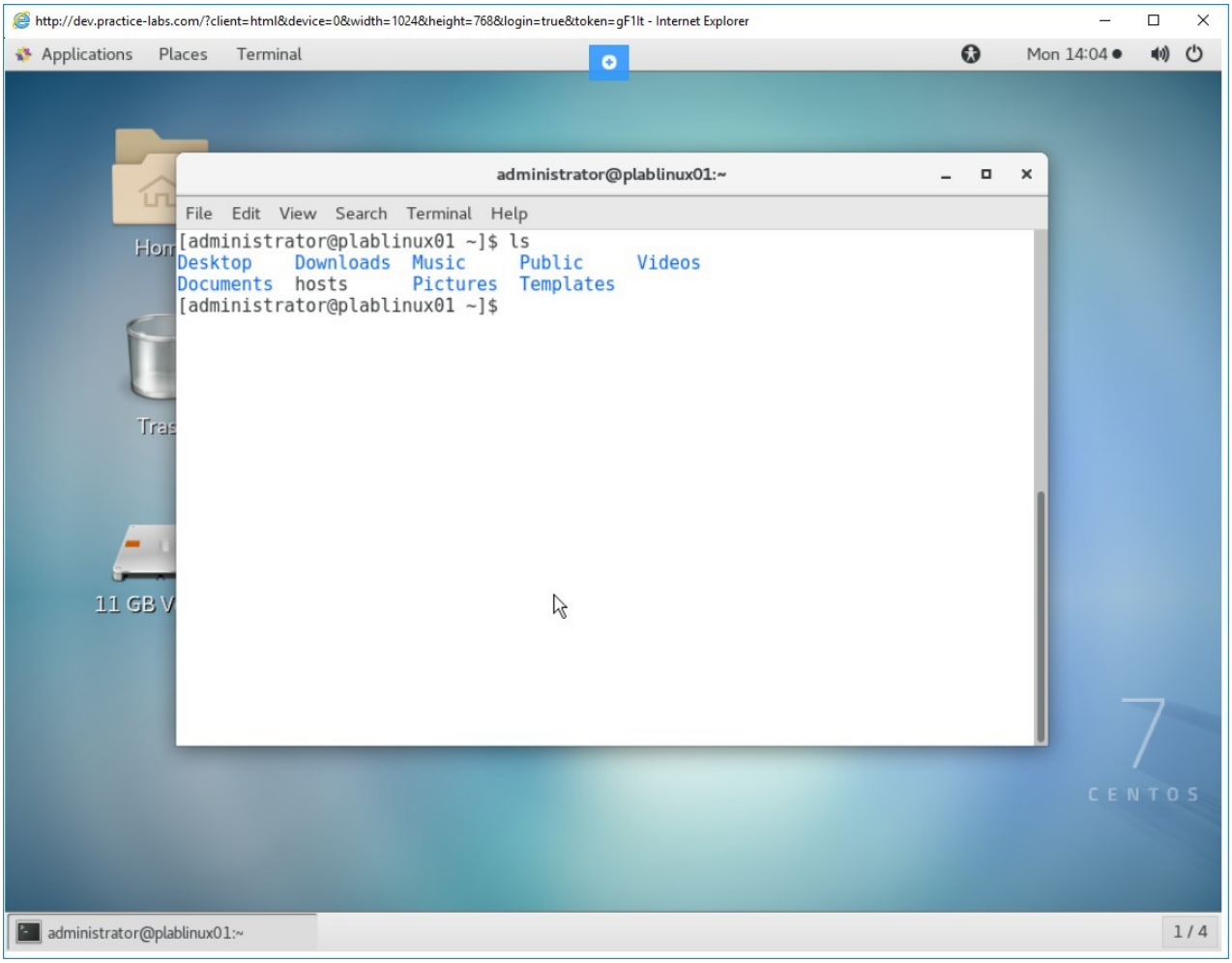


Figure 1.19 Screenshot of PLABLINUX01: Listing the files in the home directory.

Task 4 - Use tar with various Compression Tools

The tar tool is an archiving utility. It can be used with a various compression tool. Some of these tools are bzip2, xz, and gzip.

In this task, you will use tar with various compression tools.

To use tar with various compression tools, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

When you need to use **tar** with **gzip**, you need to use the **-z** parameter. To use tar with **gzip**, type the following command:

```
tar czvf hosts.tar.gz hosts
```

Press **Enter**.

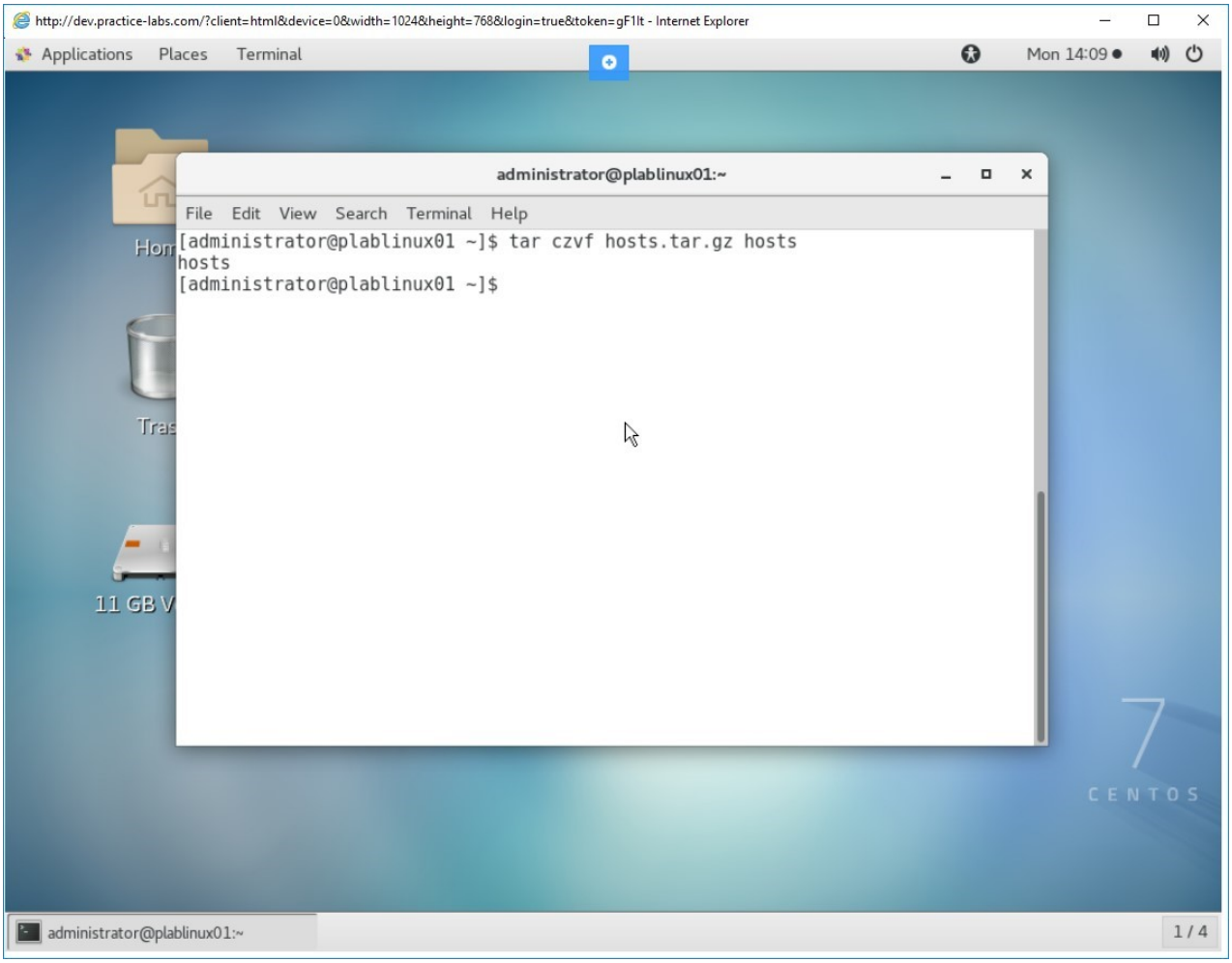


Figure 1.20 Screenshot of PLABLINUX01: Compressing a file using tar and gzip.

Step 2

You can view the contents of a **tar** file without extracting it. You will need to use **-t** instead of **-c**. To view the contents, type the following command:

```
tar tzvf hosts.tar.gz hosts
```

Press **Enter**. Notice that the contents of the hosts.tar.gz are displayed.

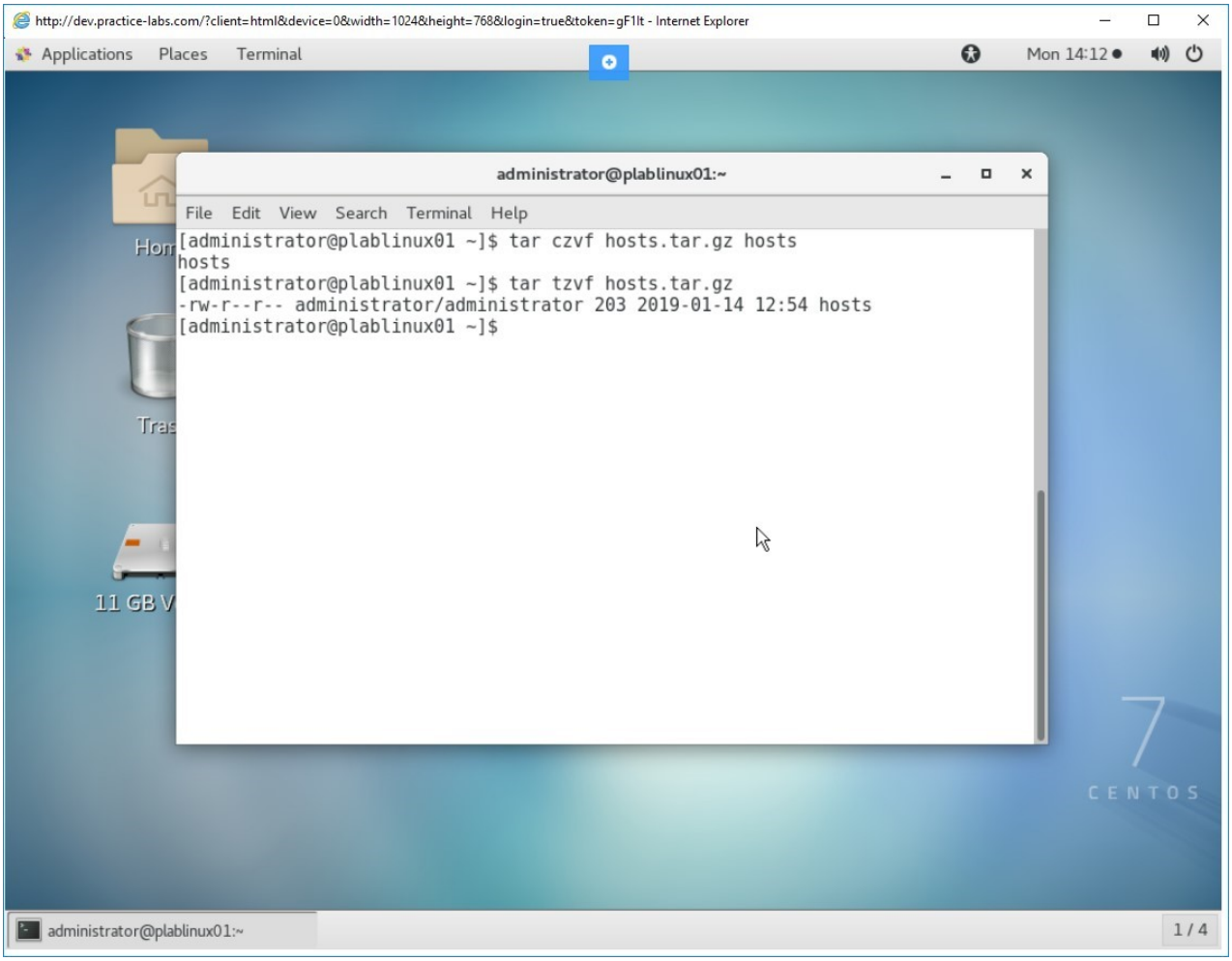


Figure 1.21 Screenshot of PLABLINUX01: Viewing the contents of the compressed file.

Step 3

Decompression is done with the **-x** parameter. To decompress the **hosts.tar.gz** file, type the following command:

```
tar xzvf hosts.tar.gz
```

Press **Enter**.

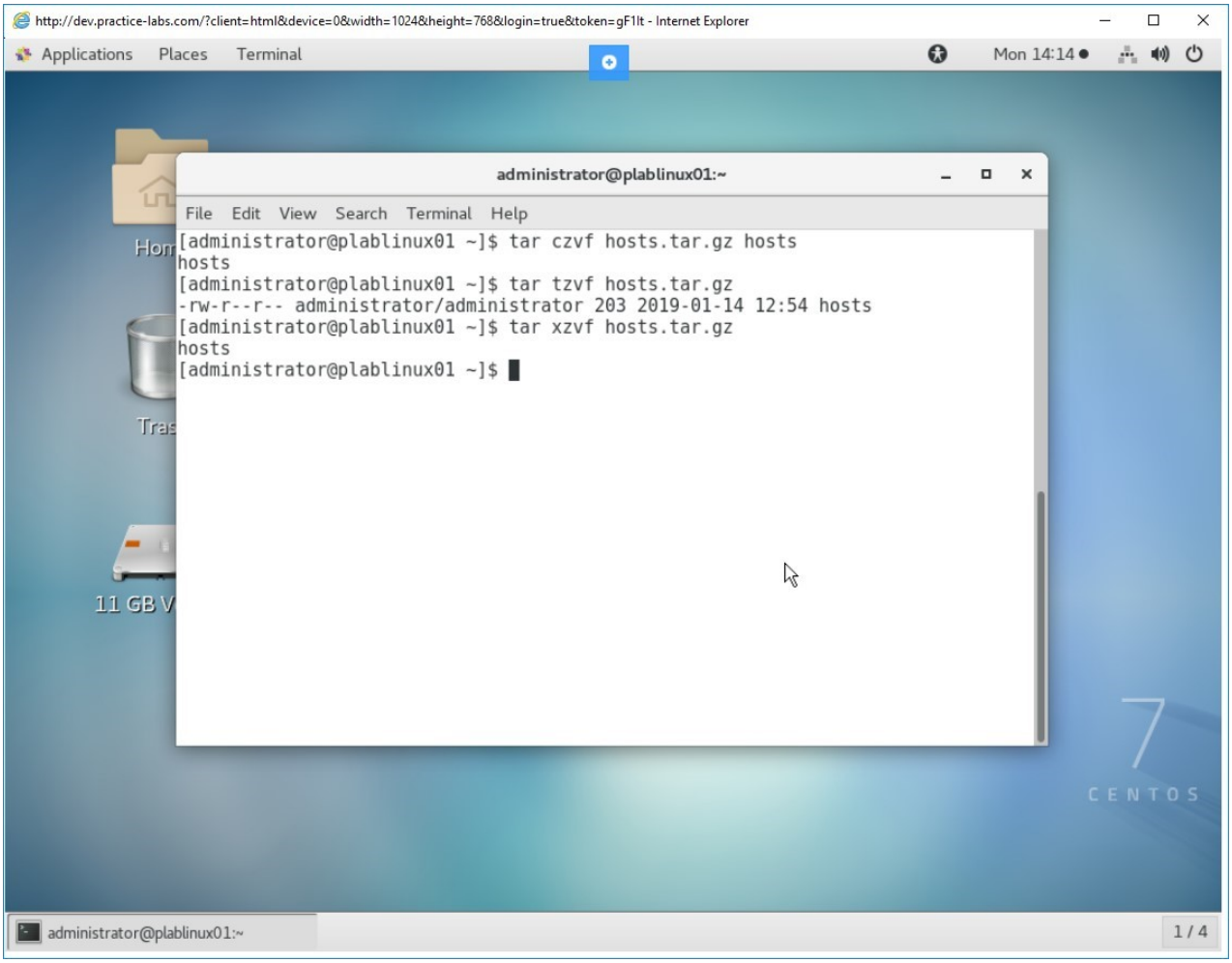


Figure 1.22 Screenshot of PLABLINUX01: Decompressing a compressed file using tar and gzip.

Step 4

Clear the screen by entering the following command:

```
clear
```

To verify that the file is now decompressed, type the following command:

```
ls
```

Press **Enter**. Notice that the hosts.tar.gz and hosts files are present.

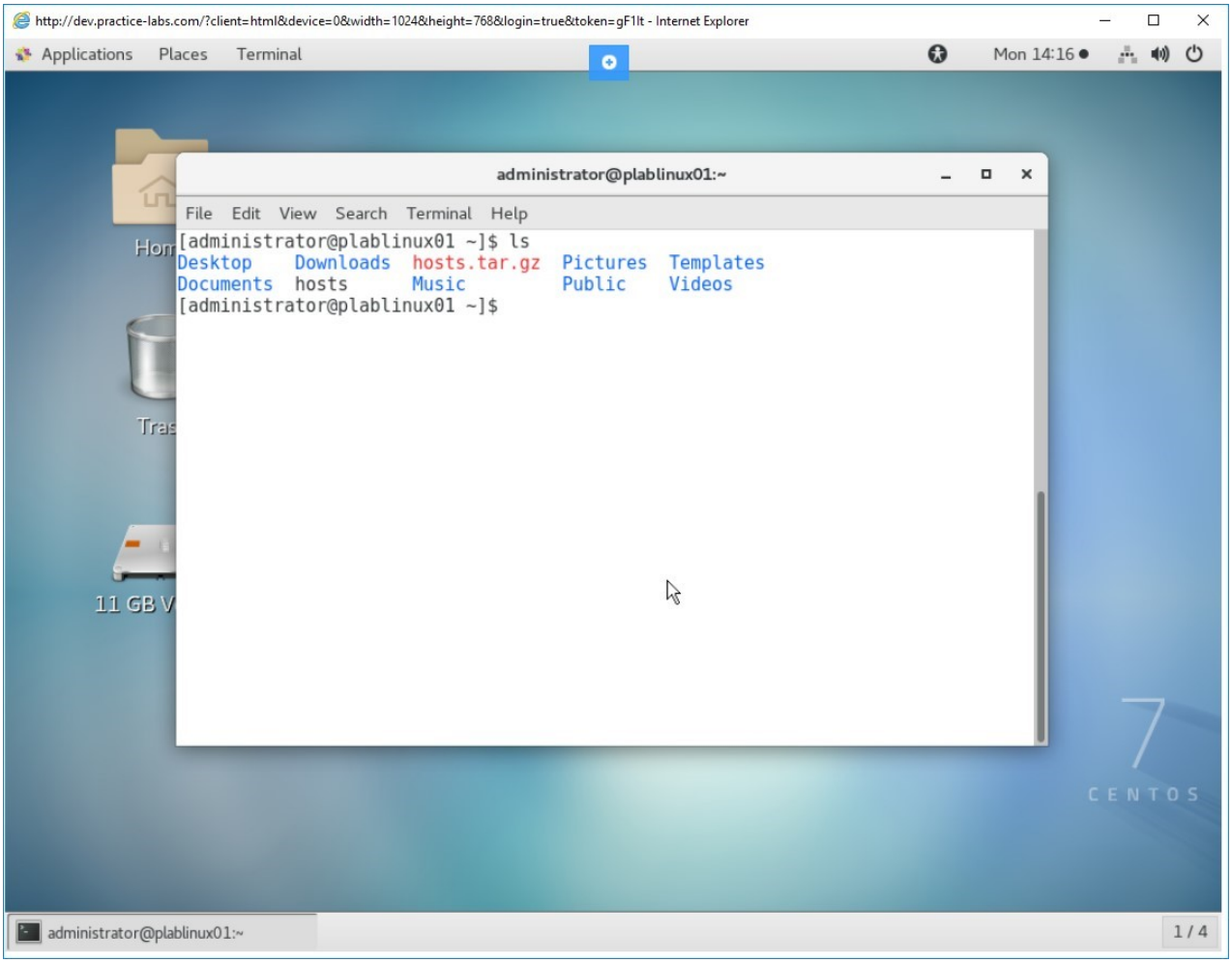


Figure 1.23 Screenshot of PLABLINUX01: Listing the files in the home directory.

Step 5

Clear the screen by entering the following command:

```
clear
```

When you need to use **tar** with **bzip2**, you need to use the **-j** parameter. To use **tar** with **bzip2**, type the following command:

```
tar cjvf hosts.tar.bz2 hosts
```

Press **Enter**. Notice that the command has replaced -z with -j.

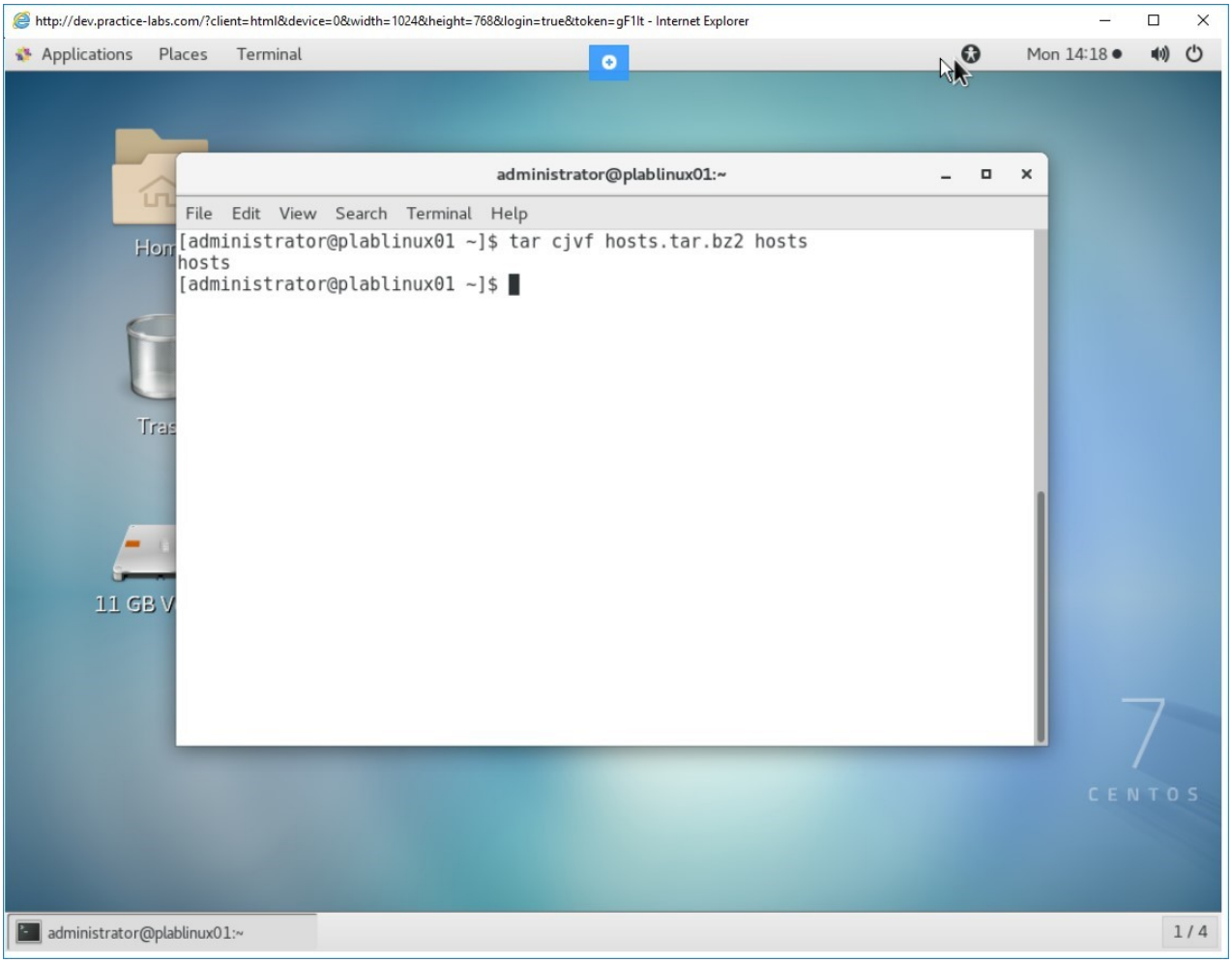


Figure 1.24 Screenshot of PLABLINUX01: Compressing a file using tar and bzip2.

Step 6

You can view the contents of a **tar** file without extracting it. You will need to use **-t** instead of **-c**. To view the contents, type the following command:

```
tar tjvf hosts.tar.bz2 hosts
```

Press **Enter**. Notice that the contents of the **hosts.tar.bz2** are displayed.

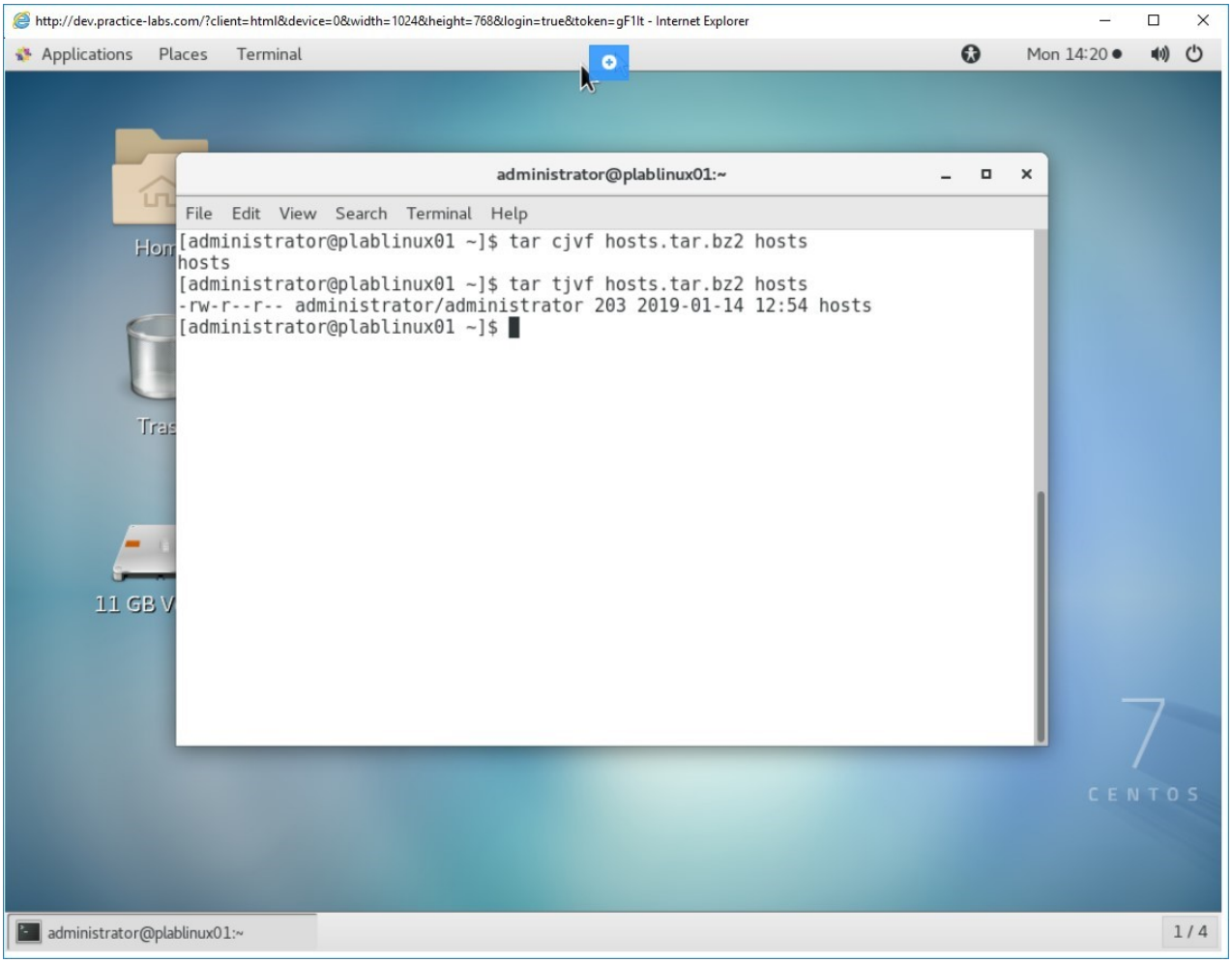


Figure 1.25 Screenshot of PLABLINUX01: Viewing the contents of the compressed file.

Step 7

Clear the screen by entering the following command:

```
clear
```

Decompression is done with the **-x** parameter. To decompress the **hosts.tar.bz2** file, type the following command:

```
tar xjvf hosts.tar.bz2
```

Press **Enter**.

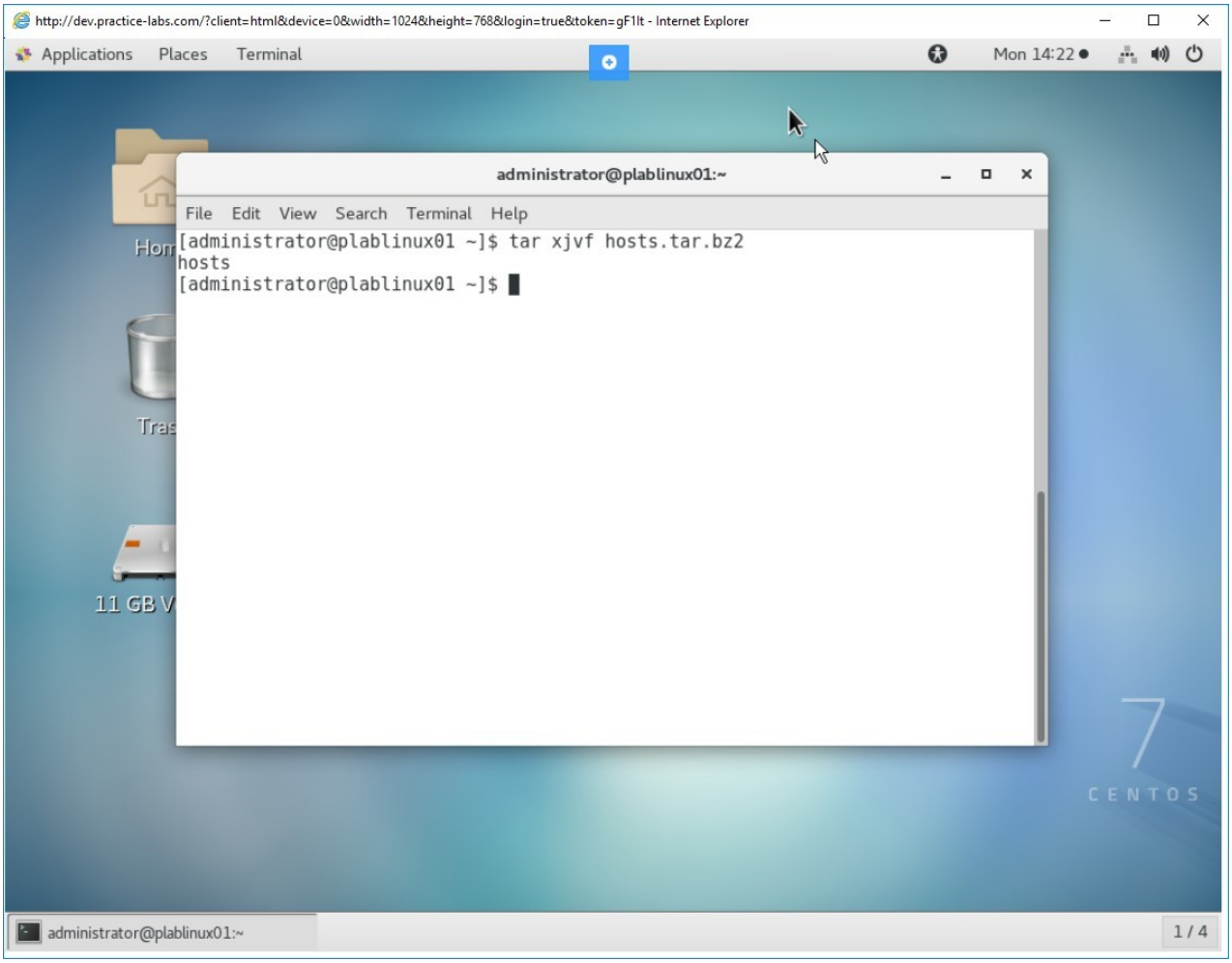


Figure 1.26 Screenshot of PLABLINUX01: Decompressing the compressed file.

Step 8

To verify that the file is now decompressed, type the following command:

```
ls
```

Press **Enter**.

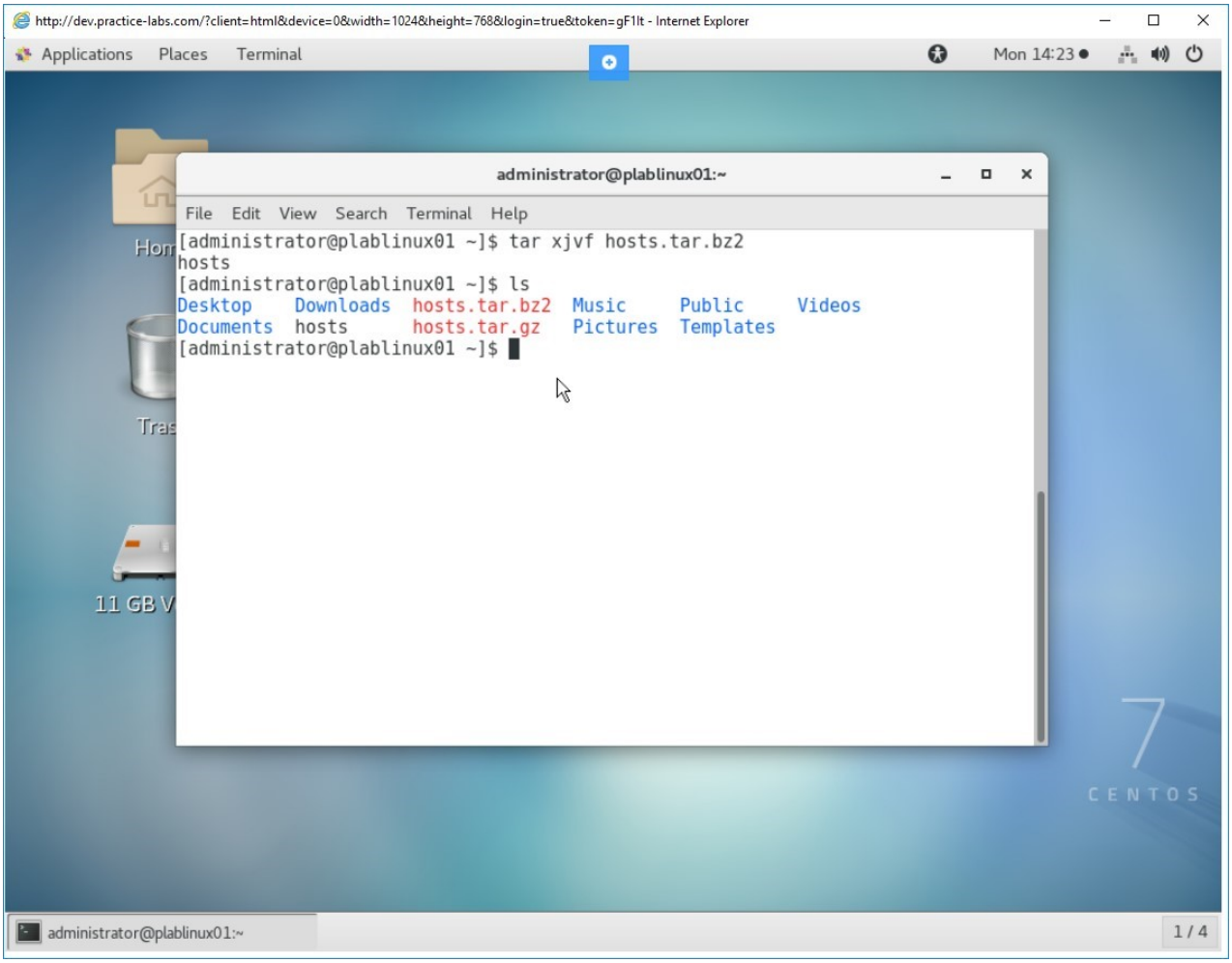


Figure 1.27 Screenshot of PLABLINUX01: Listing the files in the home directory.

Step 9

Clear the screen by entering the following command:

```
clear
```

When you need to use **tar** with **xz**, you need to use the **-J** parameter. To use **tar** with **xz**, type the following command:

```
tar cJvf hosts.tar.xz hosts
```

Press **Enter**.

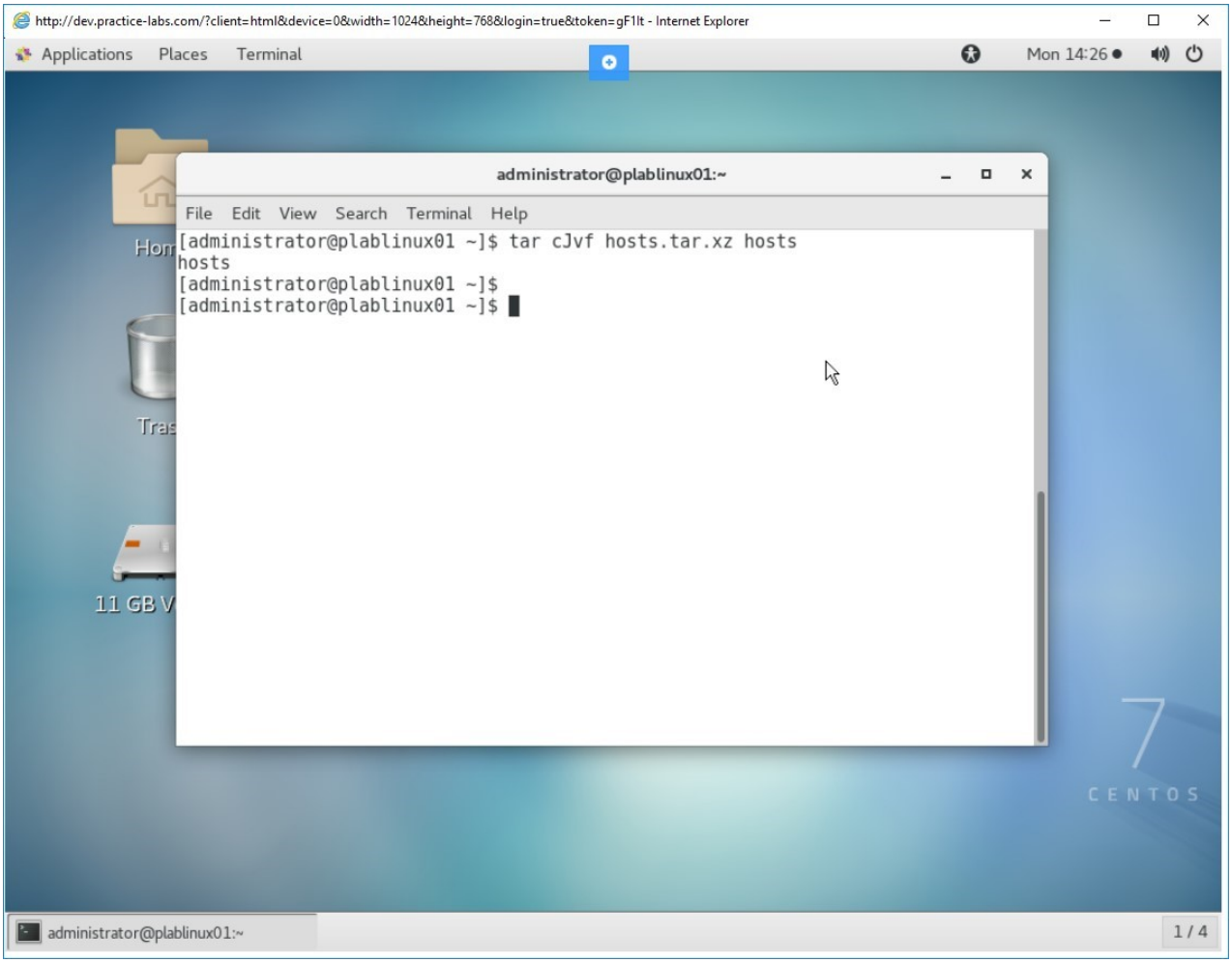


Figure 1.28 Screenshot of PLABLINUX01: Compressing a file using tar and xz.

Step 10

You can view the contents of a **tar** file without extracting it. You will need to use **-t** instead of **-c**. To view the contents, type the following command:

```
tar tJvf hosts.tar.xz hosts
```

Press **Enter**. Notice that the contents of the **hosts.tar.bz2** are displayed.

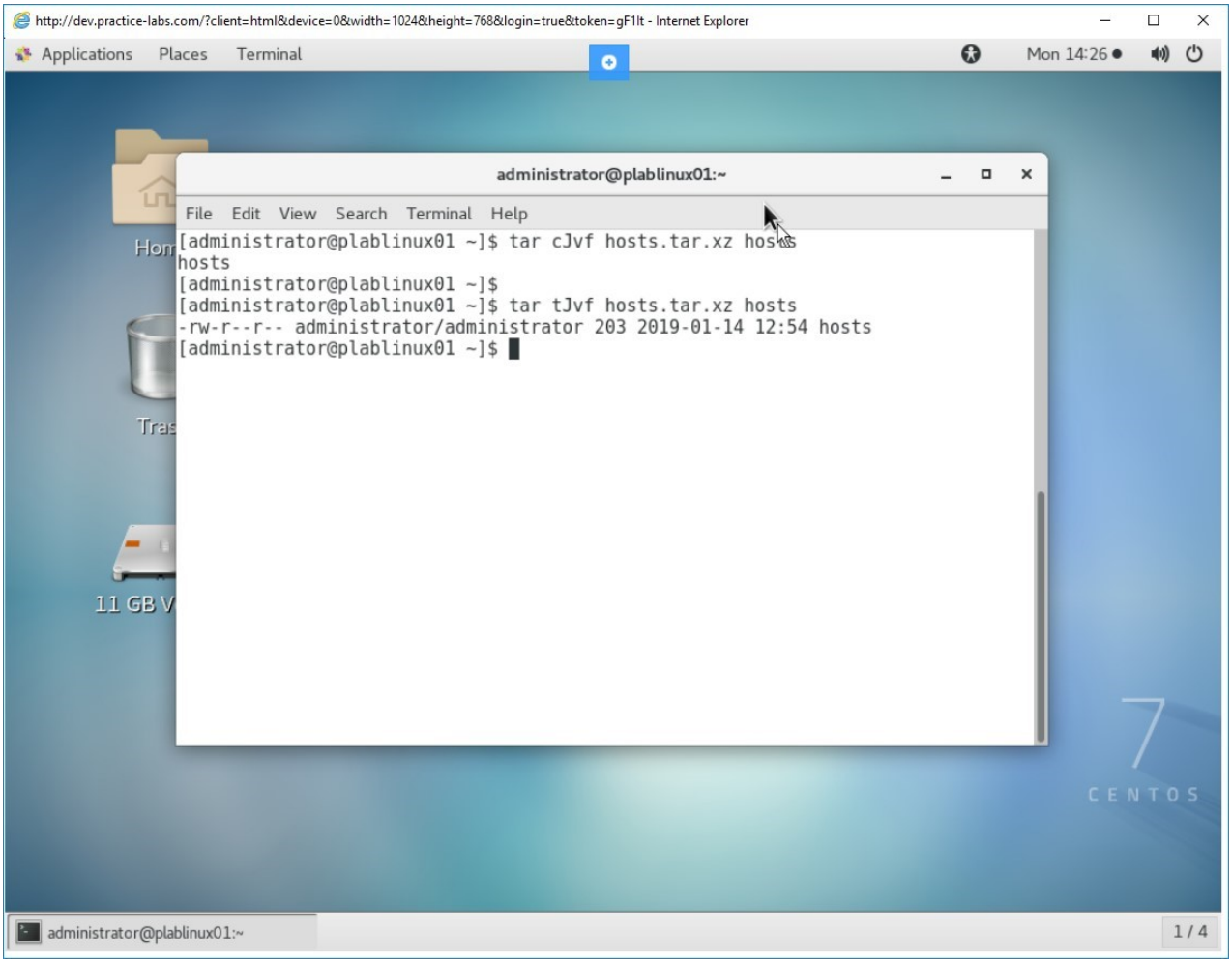


Figure 1.29 Screenshot of PLABLINUX01: Viewing the contents of the compressed file.

Step 11

Clear the screen by entering the following command:

```
clear
```

Decompression is done with the **-x** parameter. To decompress the **hosts.tar.xz** file, type the following command:

```
tar xJvf hosts.tar.xz
```

Press **Enter**.

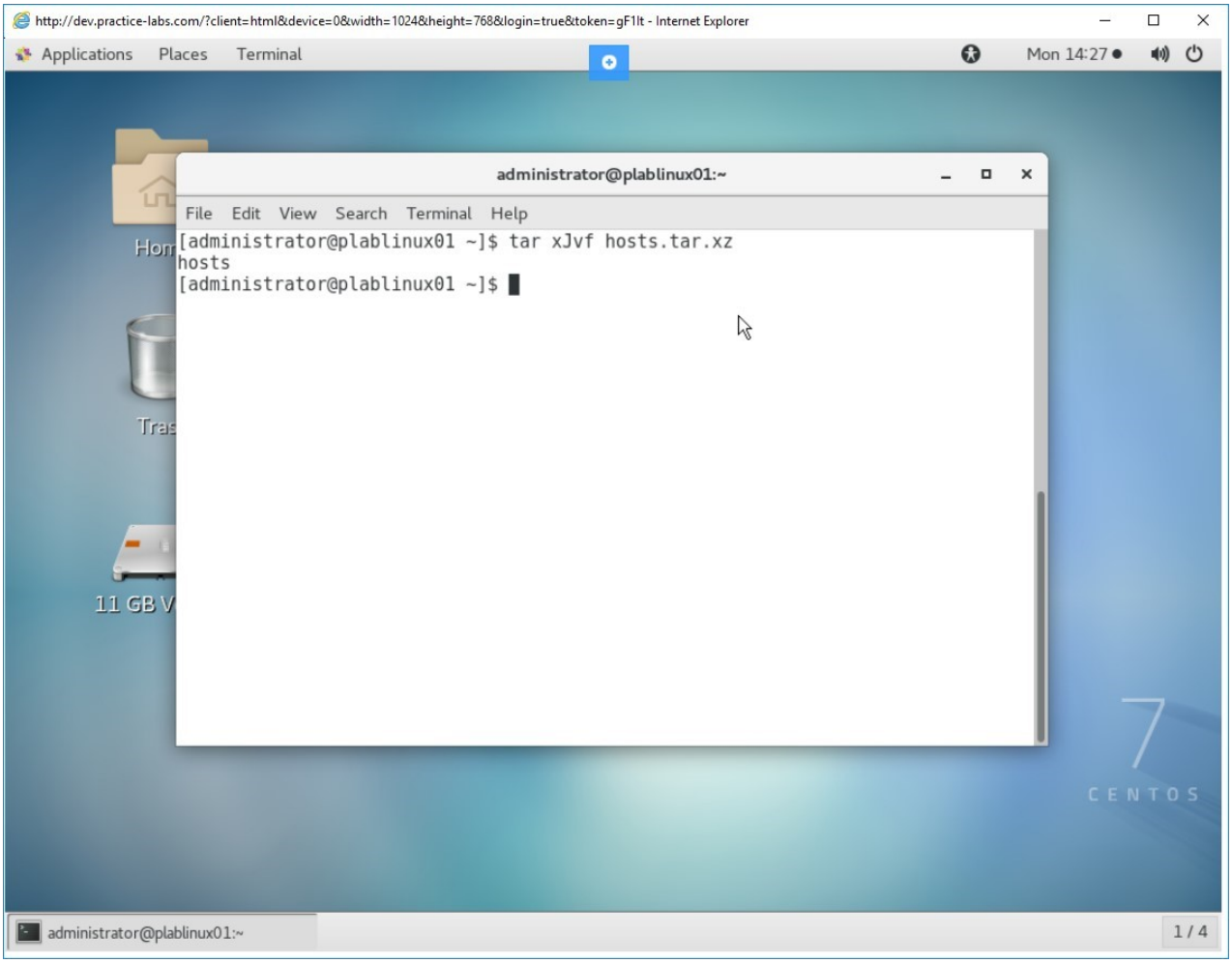


Figure 1.30 Screenshot of PLABLINUX01: Decompressing the compressed file.

Step 12

To verify that the file is now decompressed, type the following command:

```
ls
```

Press **Enter**.

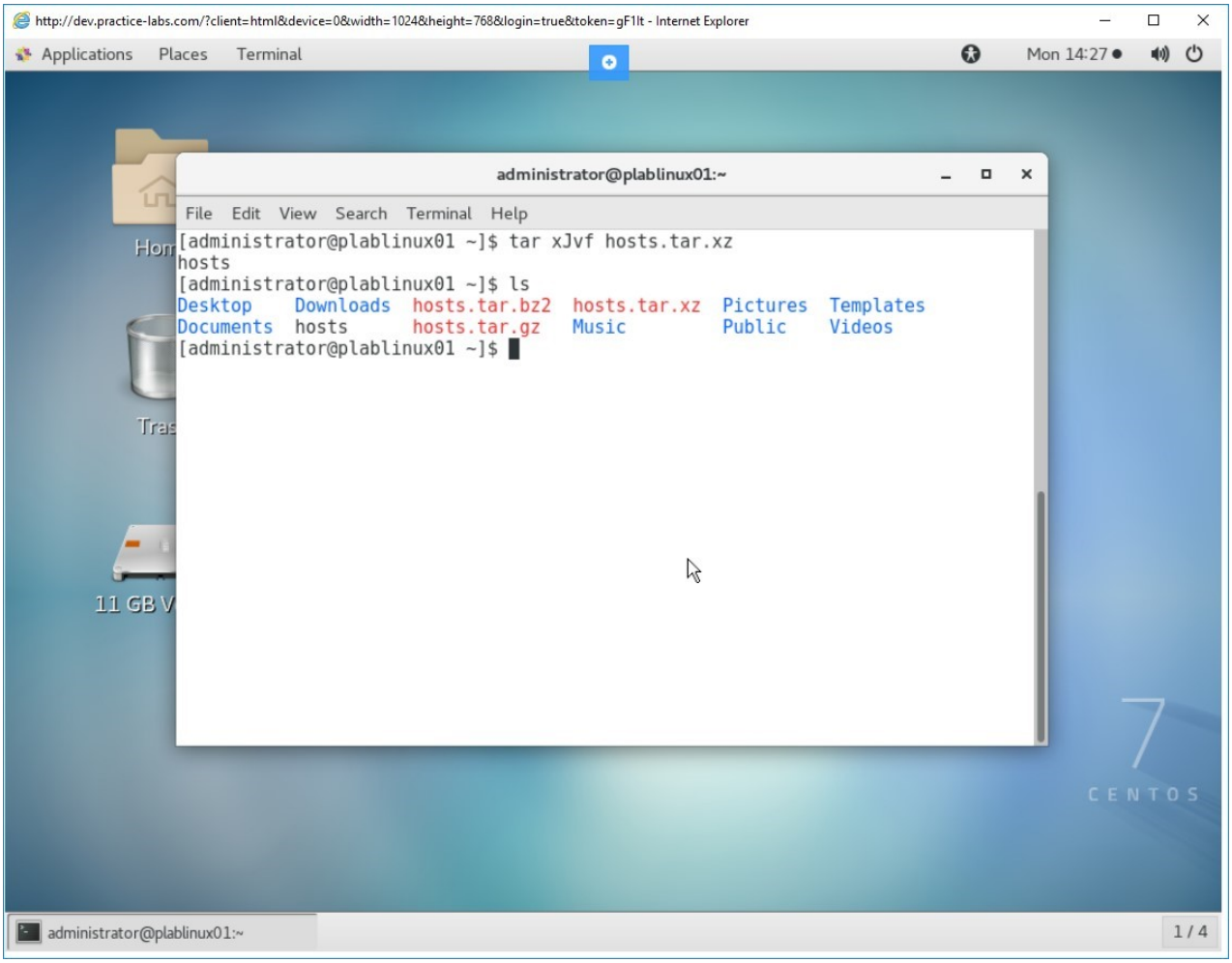


Figure 1.31 Screenshot of PLABLINUX01: Listing the files in the home directory.

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

Review

Well done, you have completed the **Compress Data Using Various Tools and Utilities** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Compress Data Using Various Tools and Utilities

You should now be able to:

- Use gzip
- Use bzip2
- Use xz
- Use tar with various compression tools

Feedback

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