CompTIA Linux+

Find System Files and Place Files in the Correct Location

Exercise 1 - Find Files and Commands on a Linux System

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Files and directories are placed in general places across different Linux distributions. However, for a Linux distribution that is FHS compliant, a user can very well predict the common locations for specific directories, such as /etc and /var. The Filesystem Hierarchy Standard or FHS specification specifies the file and directory layout in a Linux system.

In this exercise, you will understand how to find files and commands on the Linux system.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux system
- Learn the correct locations of files under the FHS
- Find files and commands on a Linux system

Your Devices

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

- PLABLINUX01 (CentOS Server)

Task 1 - Locations of Files Under FHS

FHS can have two different categories of different types of directories and files:

- Shareable and unshareable: Shareable files can be located on one Linux system and shared with another Linux system. The /usr and /opt directories and files are an example of this. On the other hand, unshareable files cannot be shared across systems. The /etc and /boot directories and files are an example of this.
- Static vs. variable: Static files are the ones controlled by the administrator. An example of static file is the files under the /root directory. On the other hand, variable files can be changed by users as well as the system processes. Logs and spool files are the examples.

In this task, you will list the files included in these directories. To understand the correct locations of files under the FHS, perform the following steps:

Step 1

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

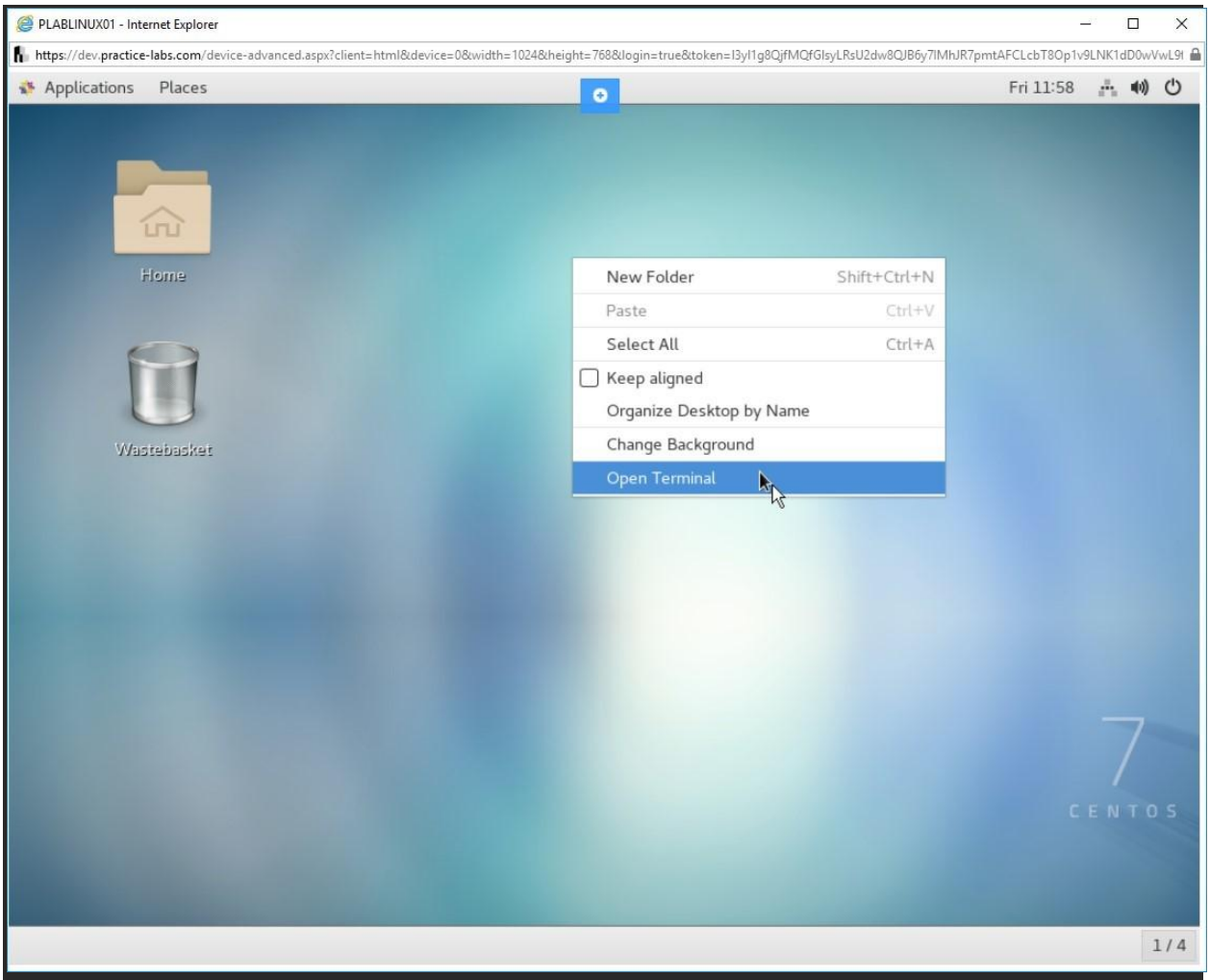

Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

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

```
su -
```

Press Enter.

At the Password prompt, type the following password:

Passw0rd

Press Enter.

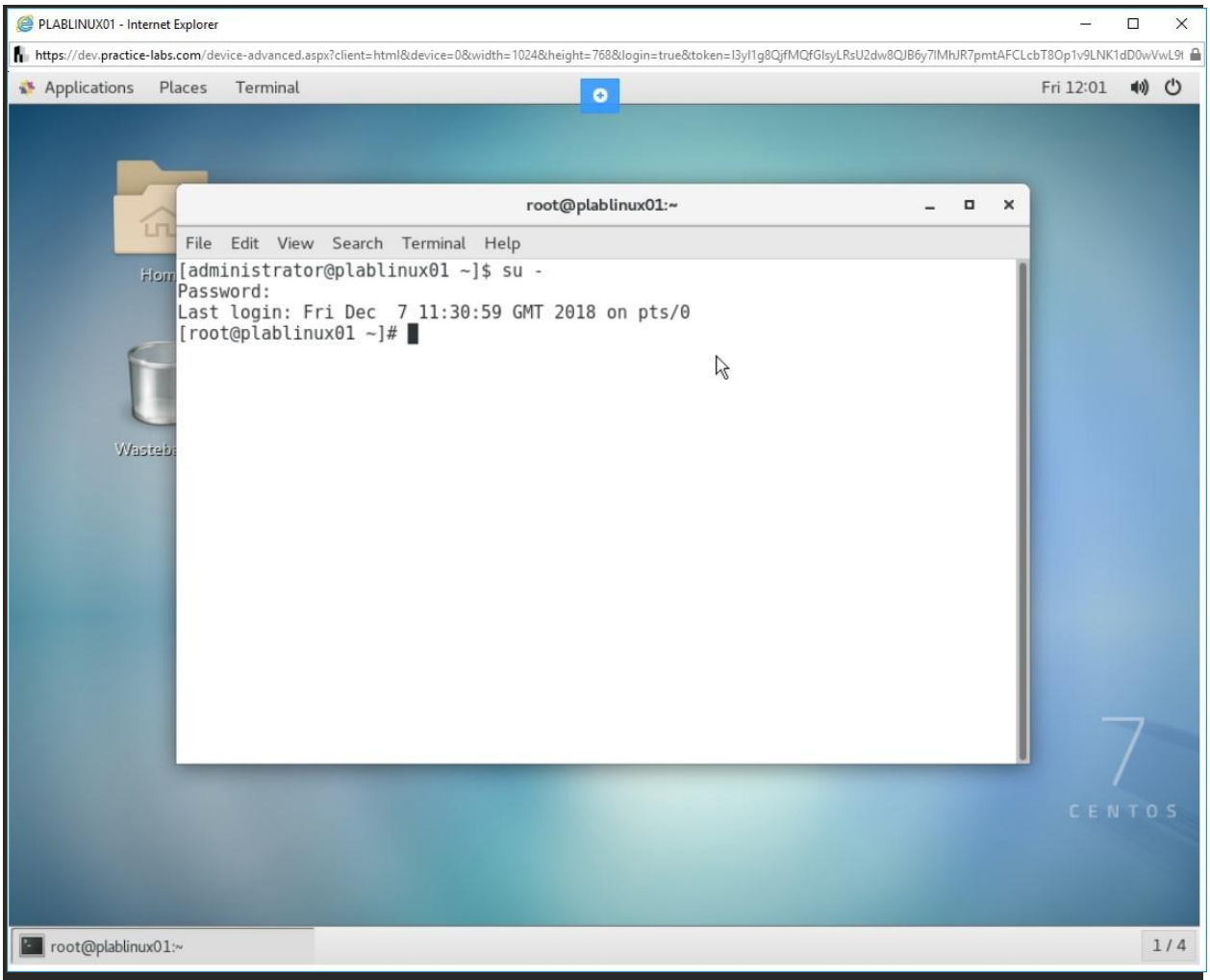

Figure 1.2 Screenshot of PLABLINUX01: Changing to the root account with the su command.

Step 3

To change to the root directory, type the following command:

```
cd ..
```

Press Enter.

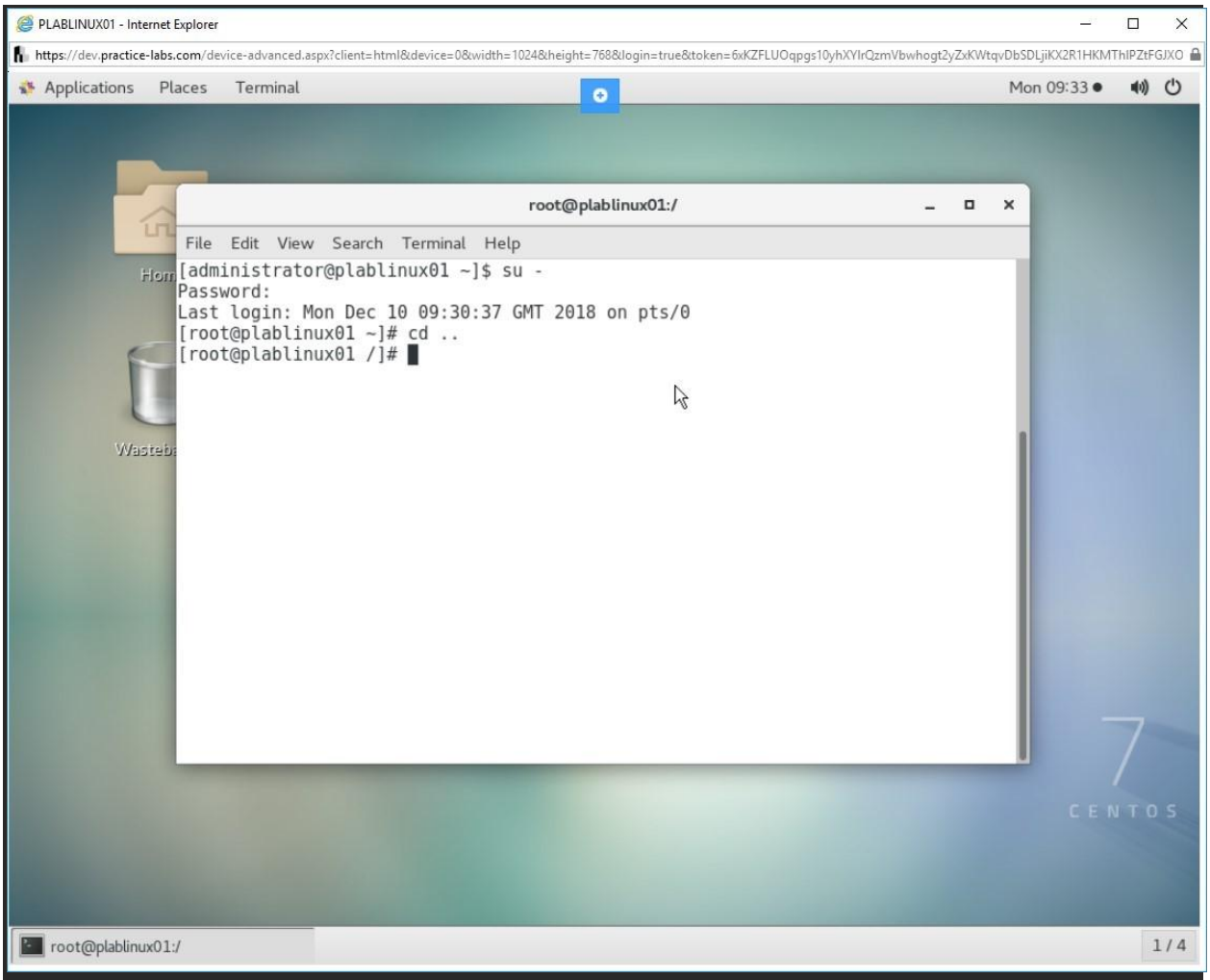

Figure 1.3 Screenshot of PLABLINUX01: Changing to the root directory using the cd .. command.

Step 4

Now, list the root directory structure by typing the following command:

```
ls -l
```

Press Enter.

Note that the root directory (/) contains the following directories:

- boot
- dev
- etc
- home
- lib
- lib64
- media

- mnt
- opt
- proc
- root
- run
- sbin
- srv
- sys
- tmp
- usr
- var

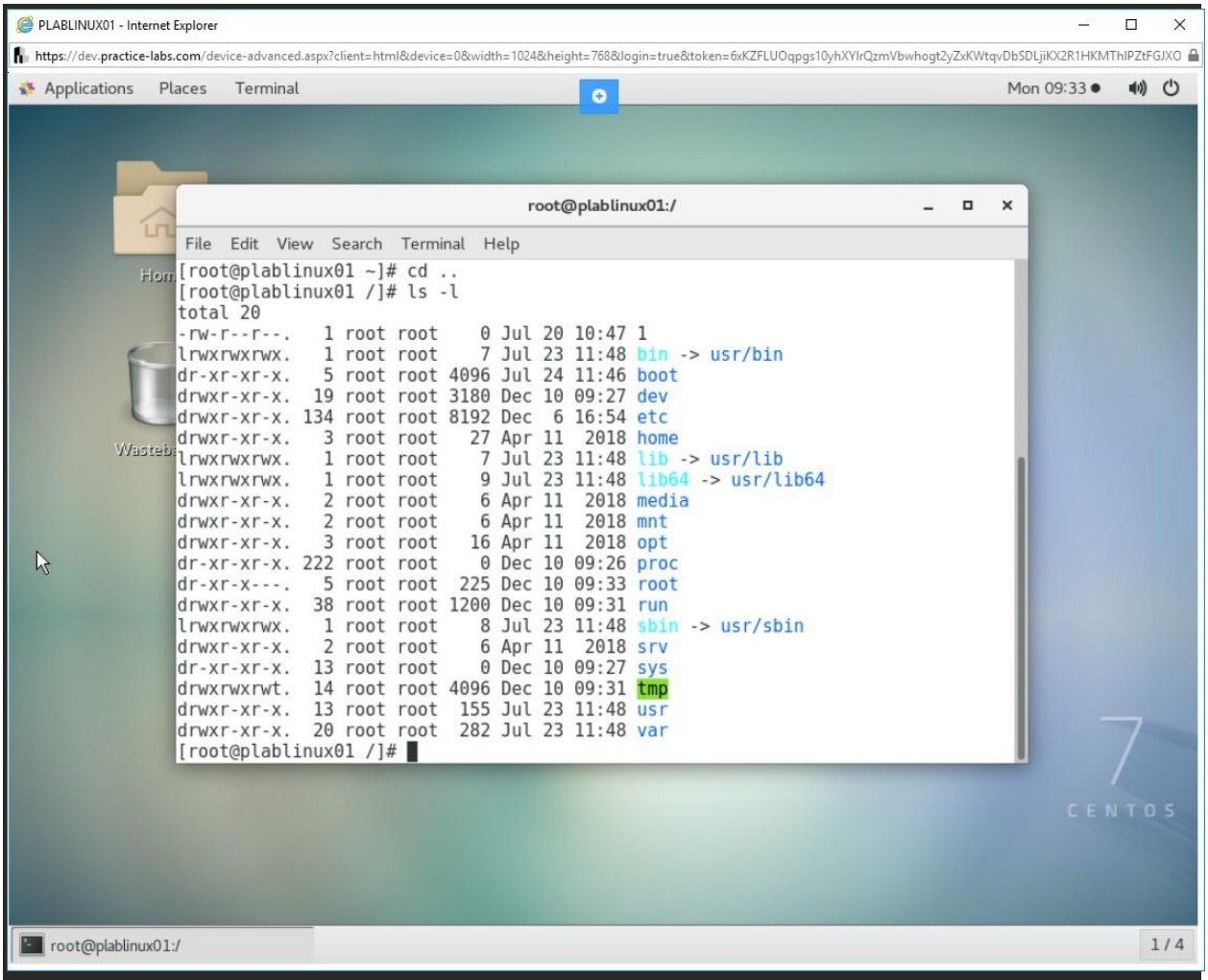

Figure 1.4 Screenshot of PLABLINUX01: Displaying the contents of the root directory.

Step 5

Clear the screen by entering the following command:

```
clear
```

Press Enter. As explained earlier, some of these directories will be static, and some will be variable. The /etc and /boot directories contain files that are static and cannot be changed by a user. Only an administrator, such as root, will be able to change them.

For example, the /etc directory contains a large number of configuration files. Only the administrator, which is the root user, will have access to these files.

To view the configuration files, type the following command:

```
ls -l /etc/*.conf
```

Press Enter.

A set of configuration files are displayed.

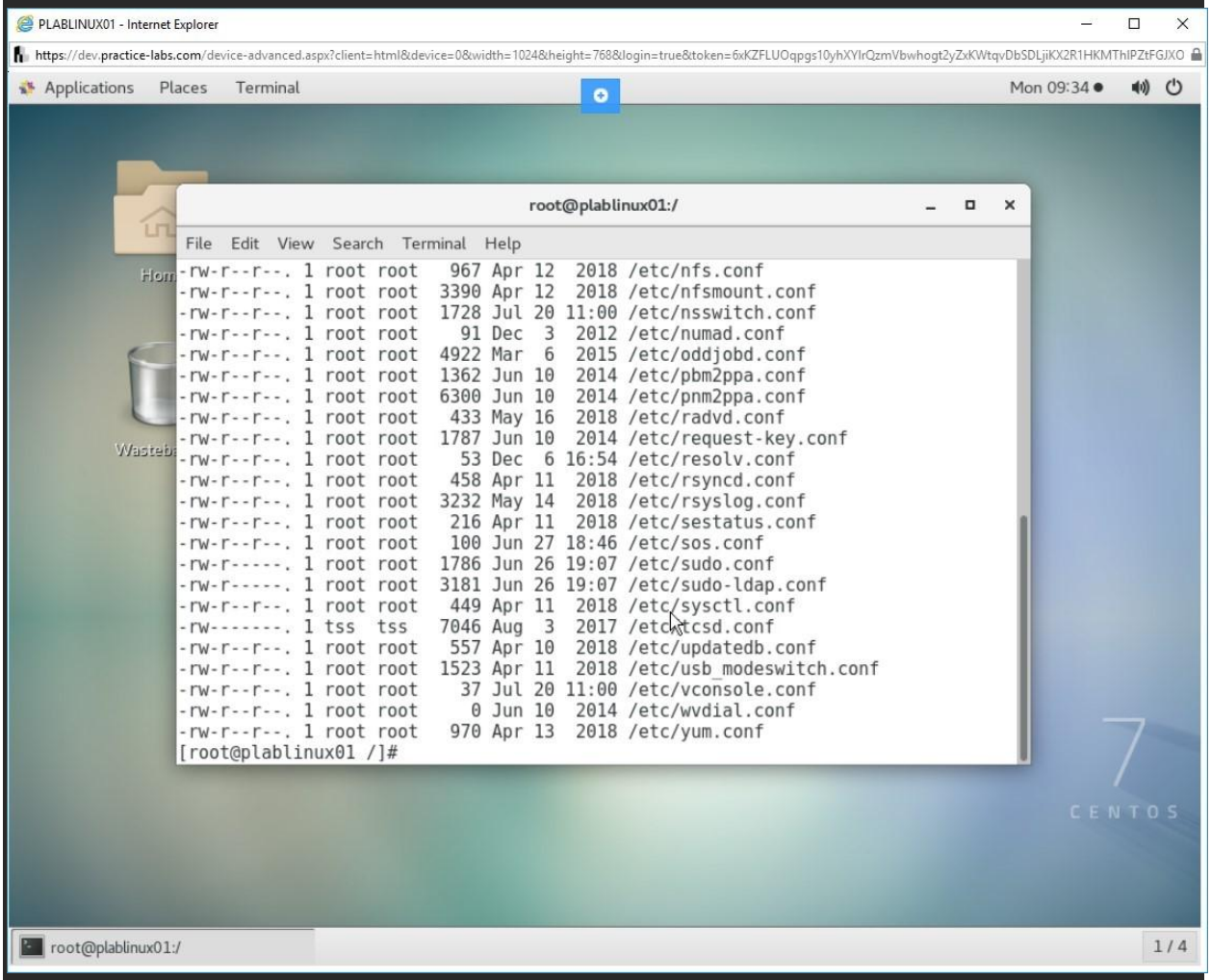

Figure 1.5 Screenshot of PLABLINUX01: Displaying the list of configuration files in the /etc directory.

Step 6

Clear the screen by entering the following command:

```
clear
```

Press Enter. The /var/log and /proc directories are unshareable but contain files that can be changed by a user or system process. To view the files in the /var/log directory, type the following command:

```
ls -l /var/log/
```

Press Enter.

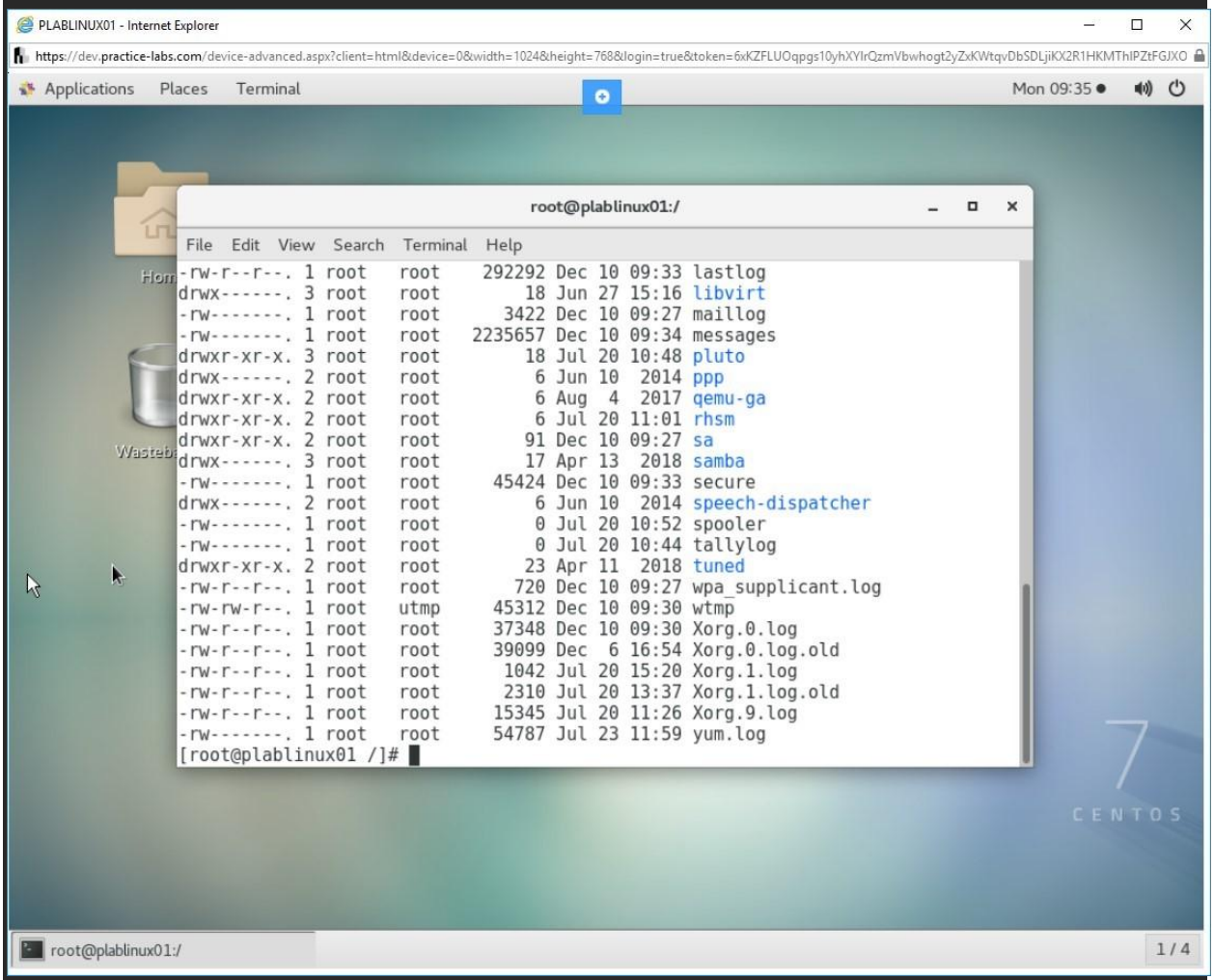

Figure 1.6 Screenshot of PLABLINUX01: Displaying the files in the /var/log directory.

Task 2 - Find files and commands on a Linux system

A small Linux distribution can contain thousands of files. For example, only the /usr directory of distribution can contain over 50,000 files. The complete installation may contain over 200,000 files. Locating a file can be difficult in a large number of files. Similarly, you can search for the path for a specific command and find out which command will be executed when you enter a specific command. In this task, you will locate files and commands in various directories.

To find files and commands on a Linux system, perform the following steps:

Step 1

Clear the screen by entering the following command:

```
clear
```

Press Enter. To find the primary location of a command (in this case yum), type the following command:

```
which yum
```

Press Enter.

Note that the first occurrence where this command appears is displayed.

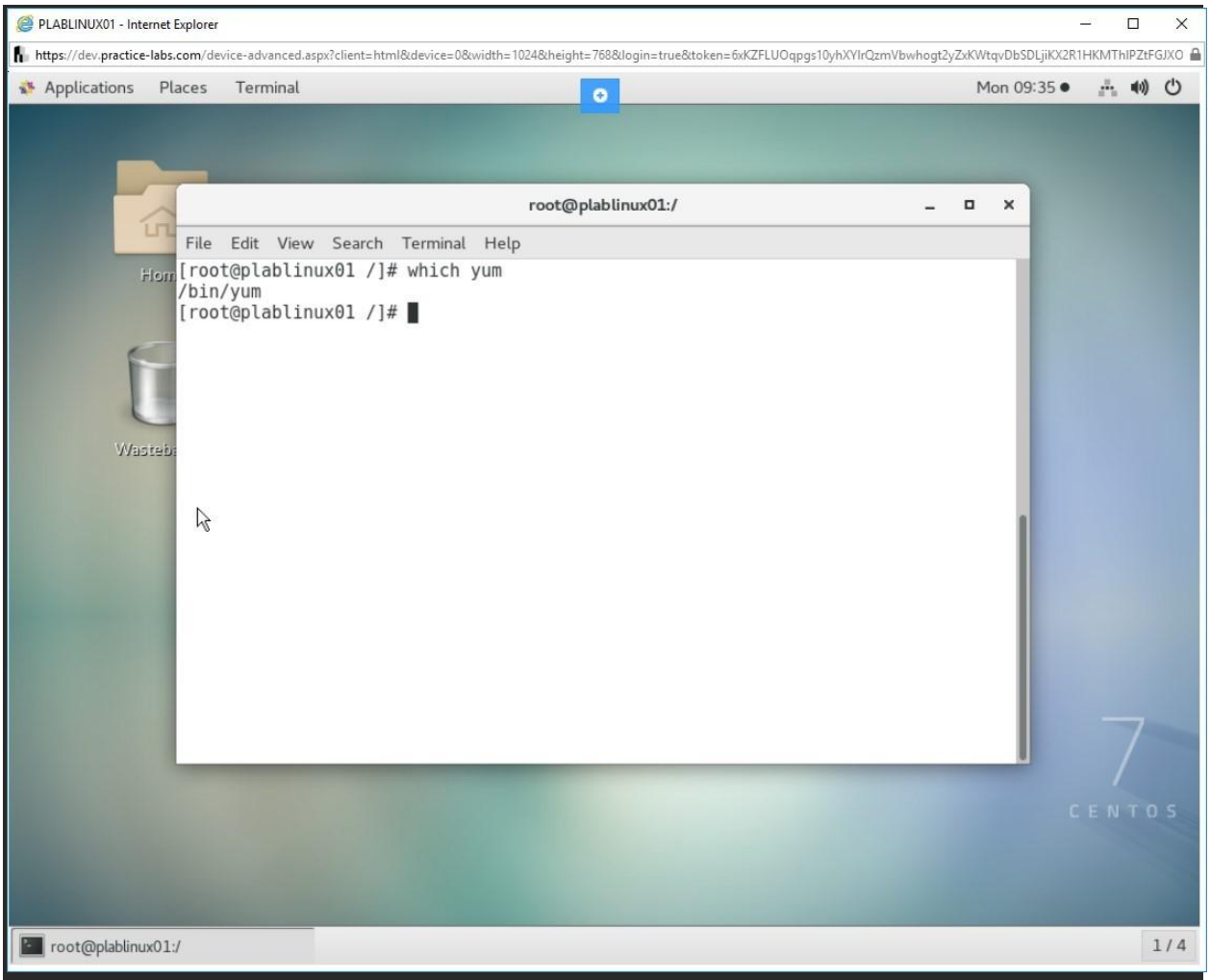

Figure 1.7 Screenshot of PLABLINUX01: Displaying the location of a command using the which command.

Step 2

To find all the locations (specified in PATH) for a specific command, which in this case is yum, type the following command:

```
which -a yum
```

Press Enter.

In this enviroment, there are two instances of the command.

Note: your output may differ.

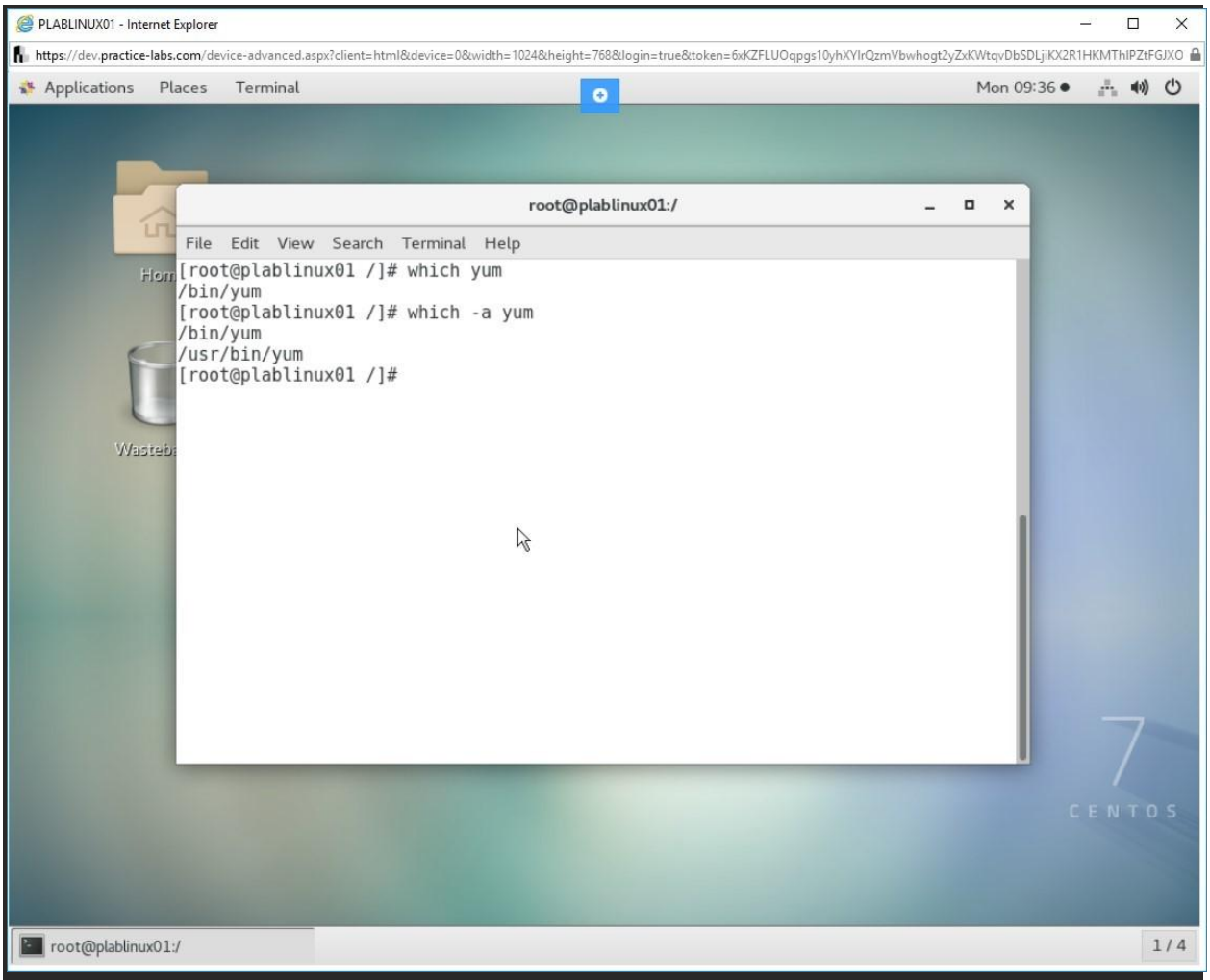

Figure 1.8 Screenshot of PLABLINUX01: Displaying the locations of a command using the which command.

Step 3

Clear the screen by entering the following command:

```
clear
```

Press Enter. Some specific types of commands, such as shell builtin, cannot be located by the which command. To verify this, type the following command:

```
which type
```

Press Enter.

The output displays that there is no type command in PATH.

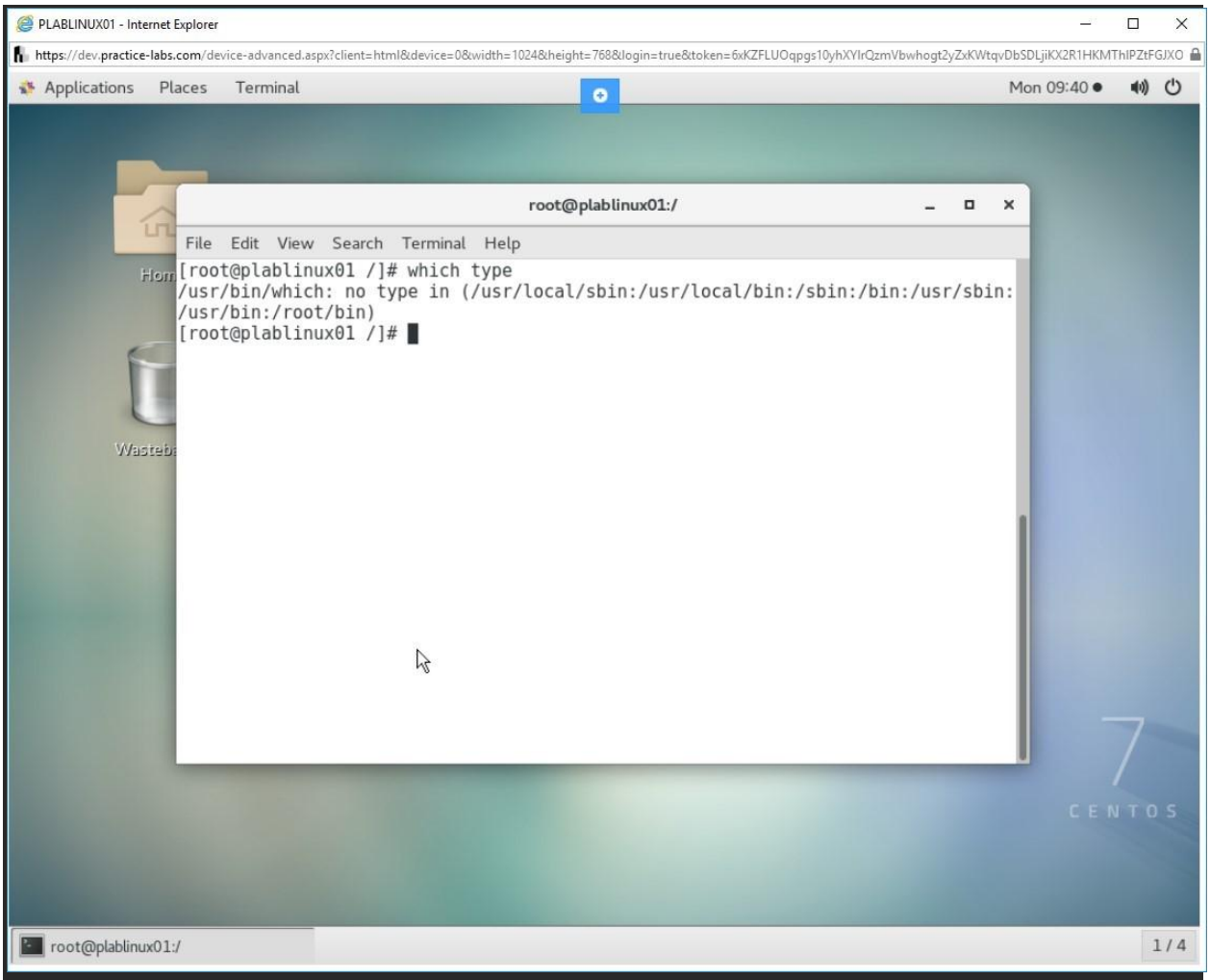

Figure 1.9 Screenshot of PLABLINUX01: Displaying the results of the which type command.

Step 4

The type command allows you to locate special commands, such as shell builtin. To verify this, type the following command:

```
type type
```

Press Enter.

The output displays that it is a shell builtin.

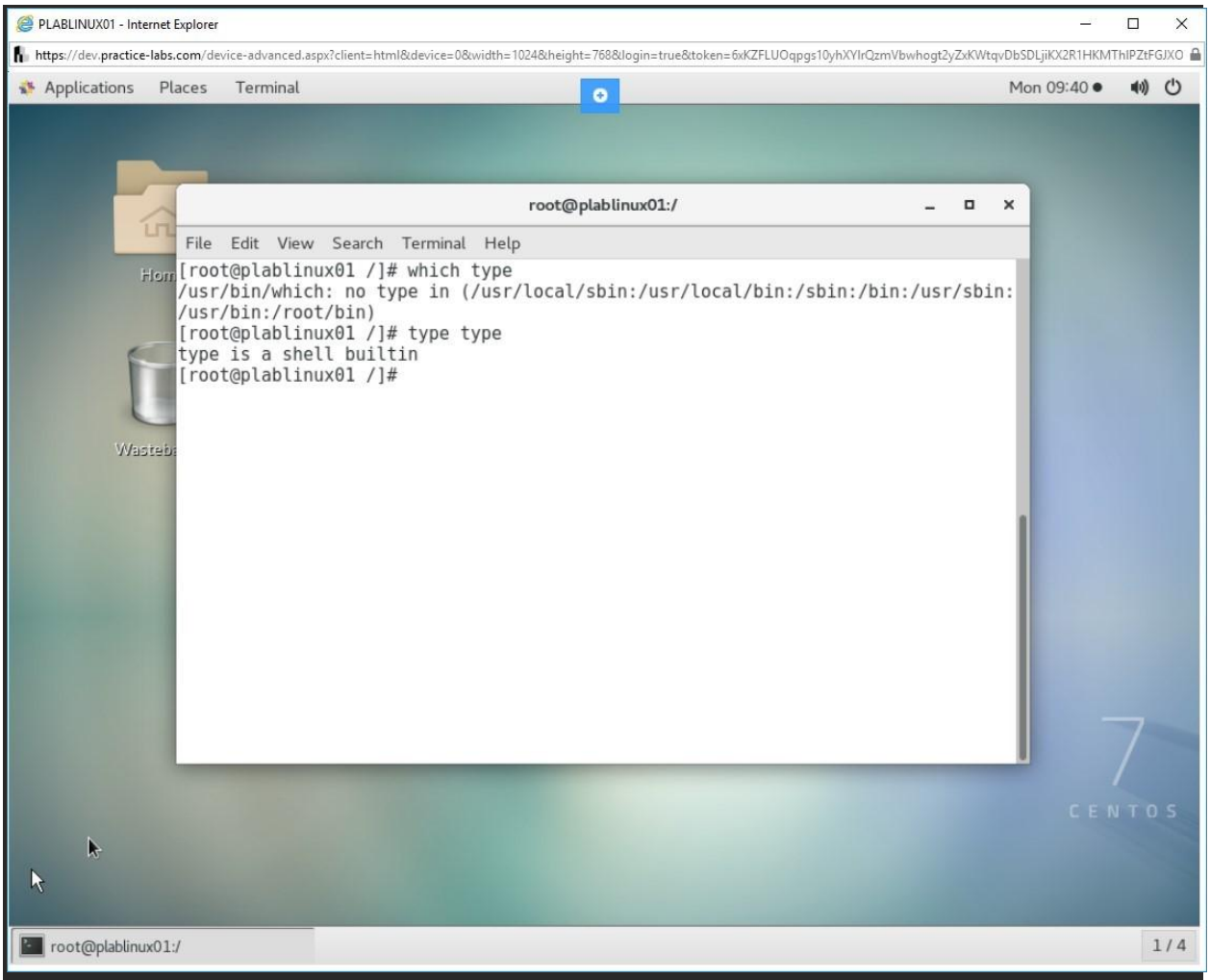

Figure 1.10 Screenshot of PLABLINUX01: Locating the special commands using the type type command.

Step 5

Clear the screen by entering the following command:

```
clear
```

Press Enter. The whereis command allows you to locate more information than just the location of the command. To find more details of a command, such as yum, type the following command:

```
whereis yum
```

Press Enter.

The output displays the location of the command, the name of the configuration file, and the location of the man pages for the command.

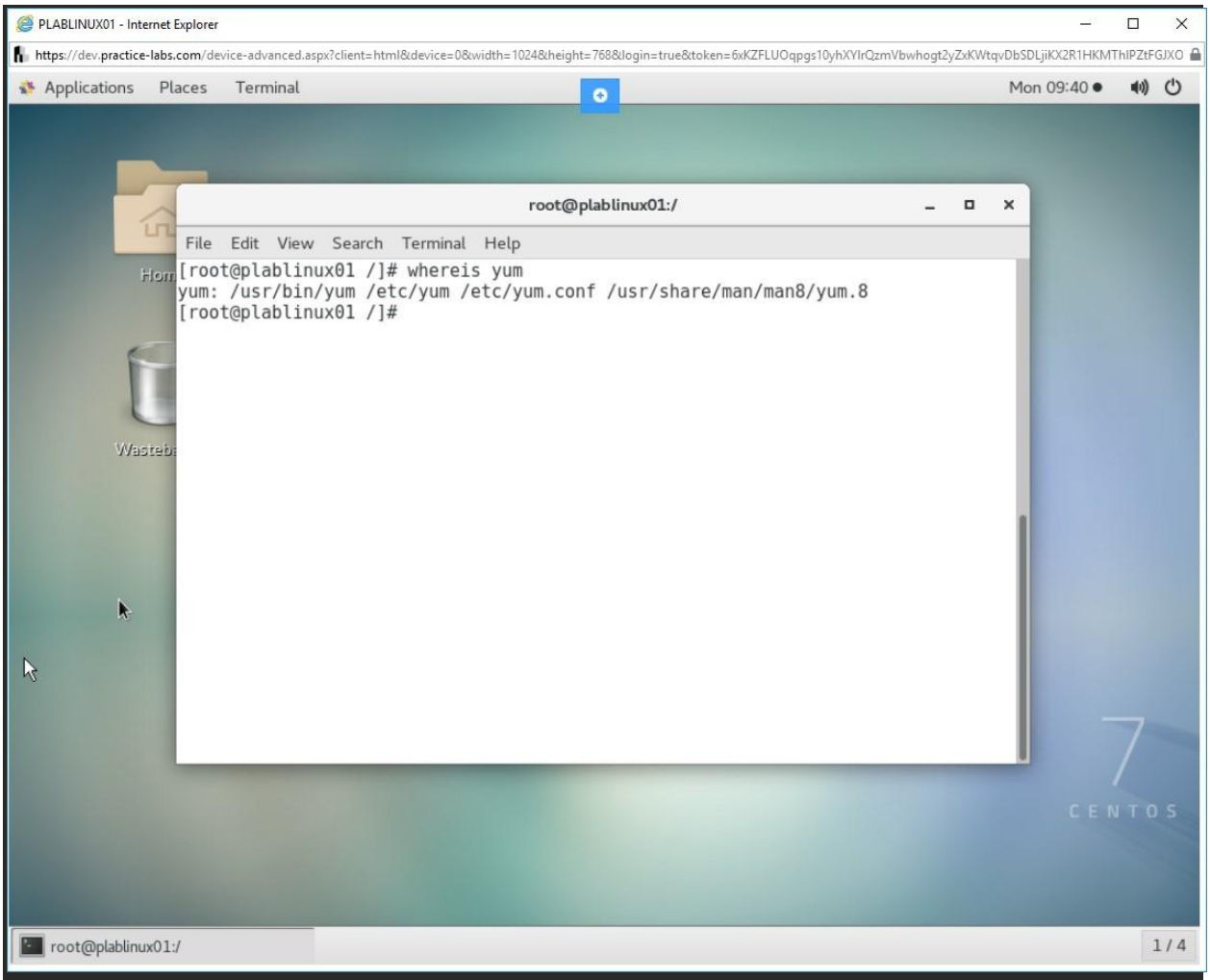

Figure 1.11 Screenshot of PLABLINUX01: Locating the information about the yum command.

Step 6

Clear the screen by entering the following command:

```
clear
```

Press Enter. There will be scenarios in which you will need to find files on your Linux system using their names or path. To find files, type the following command:

```
find . -name "yum*"
```

Press Enter.

Note: This command works only when you are in the root directory. Change to the root directory using the following command, if not already done: cd ..

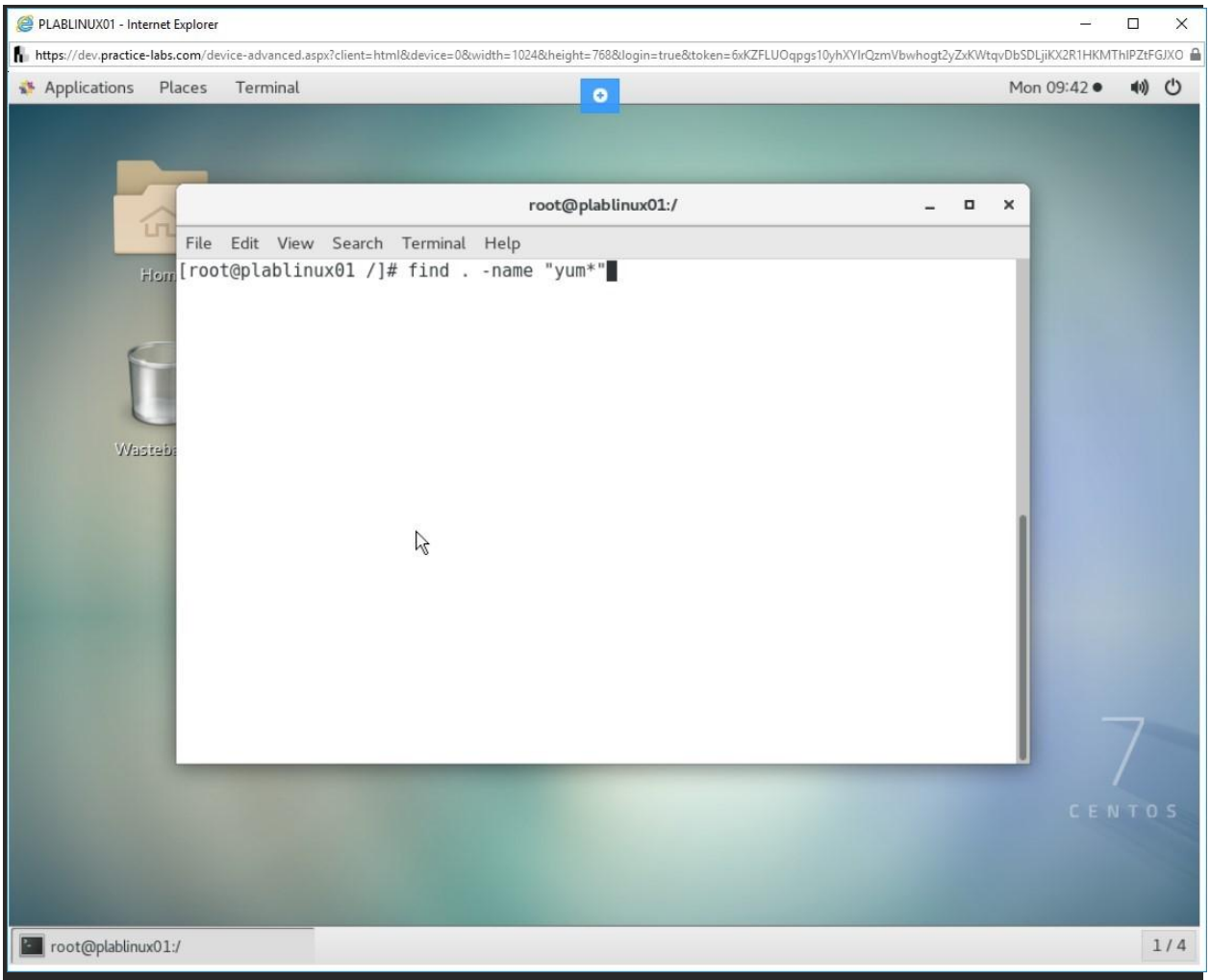

Figure 1.12 Screenshot of PLABLINUX01: Finding the yum command in the root directory.

Step 7

The output displays the names of the files and their locations.

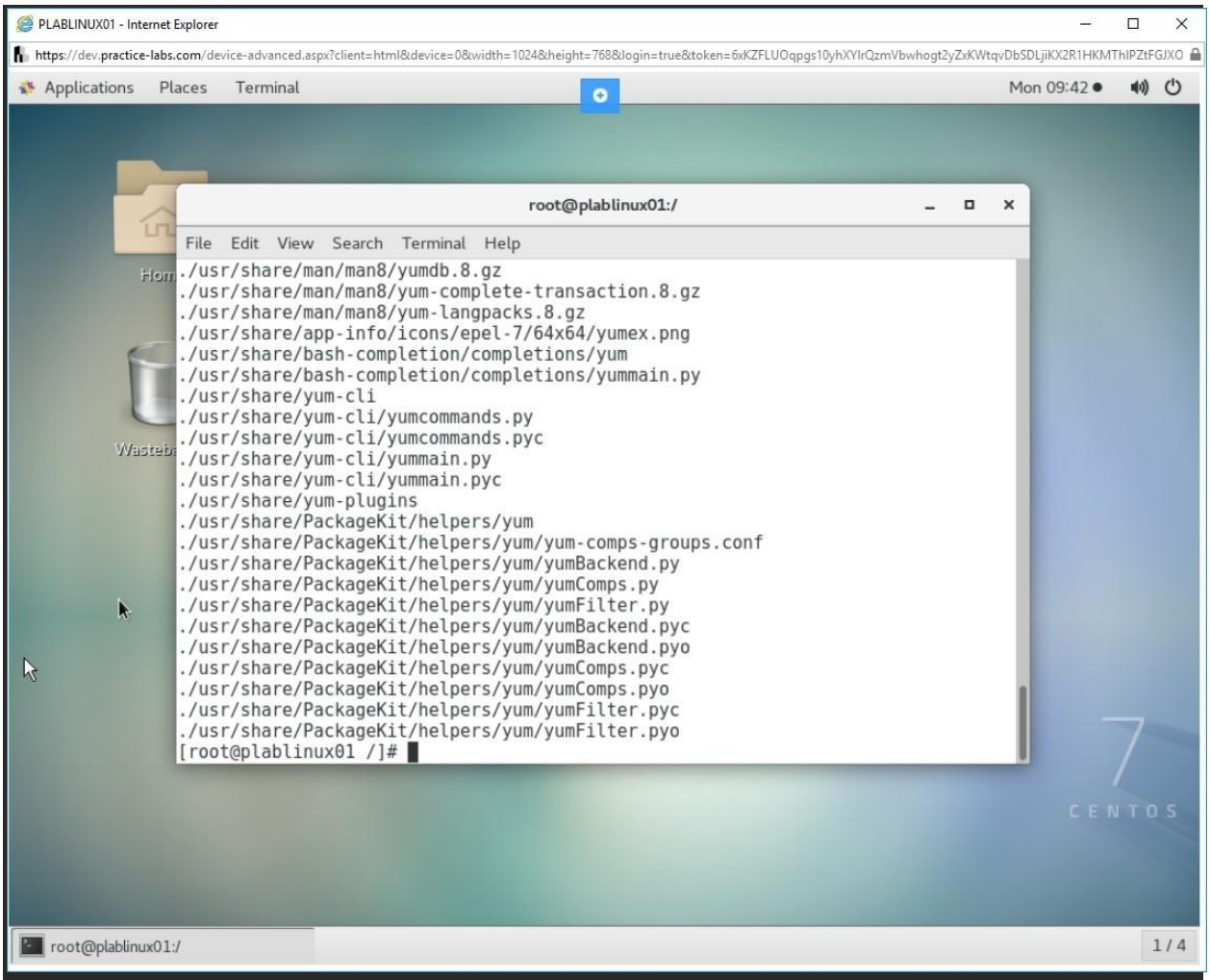

Figure 1.13 Screenshot of PLABLINUX01: Displaying the output of the find command.

Step 8

Clear the screen by entering the following command:

```
clear
```

Press Enter. Using the find command, you can also find all the directories. To find all the directories, type the following command:

```
find . -type d
```

Press Enter.

Note that the d signifies directories. d is an argument for the -type parameter. Therefore, the -type parameter allows you to specify that you are searching for the type “directories”.

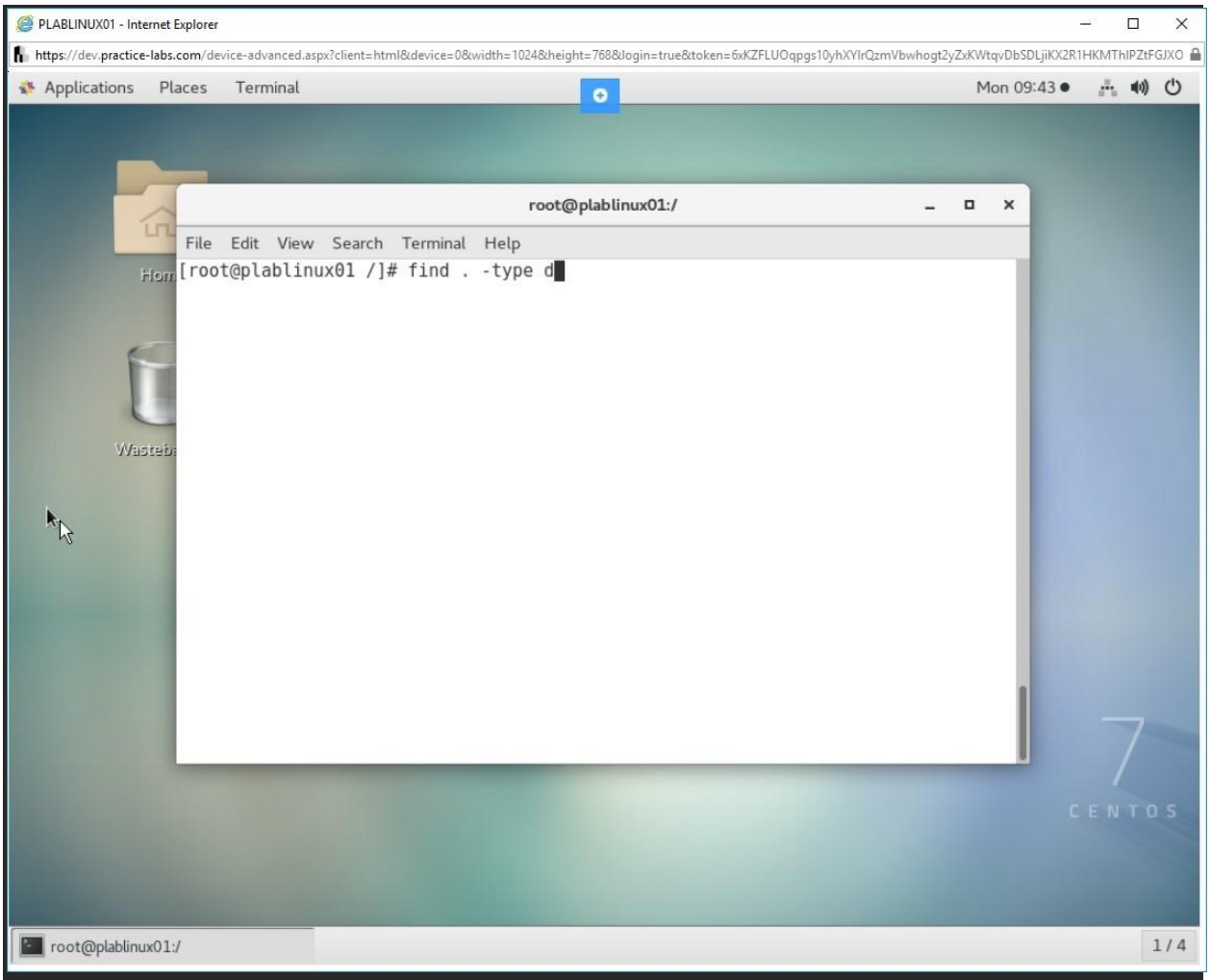

Figure 1.14 Screenshot of PLABLINUX01: Locating the list of directories in the root directory.

Step 9

The output displays all the directories.

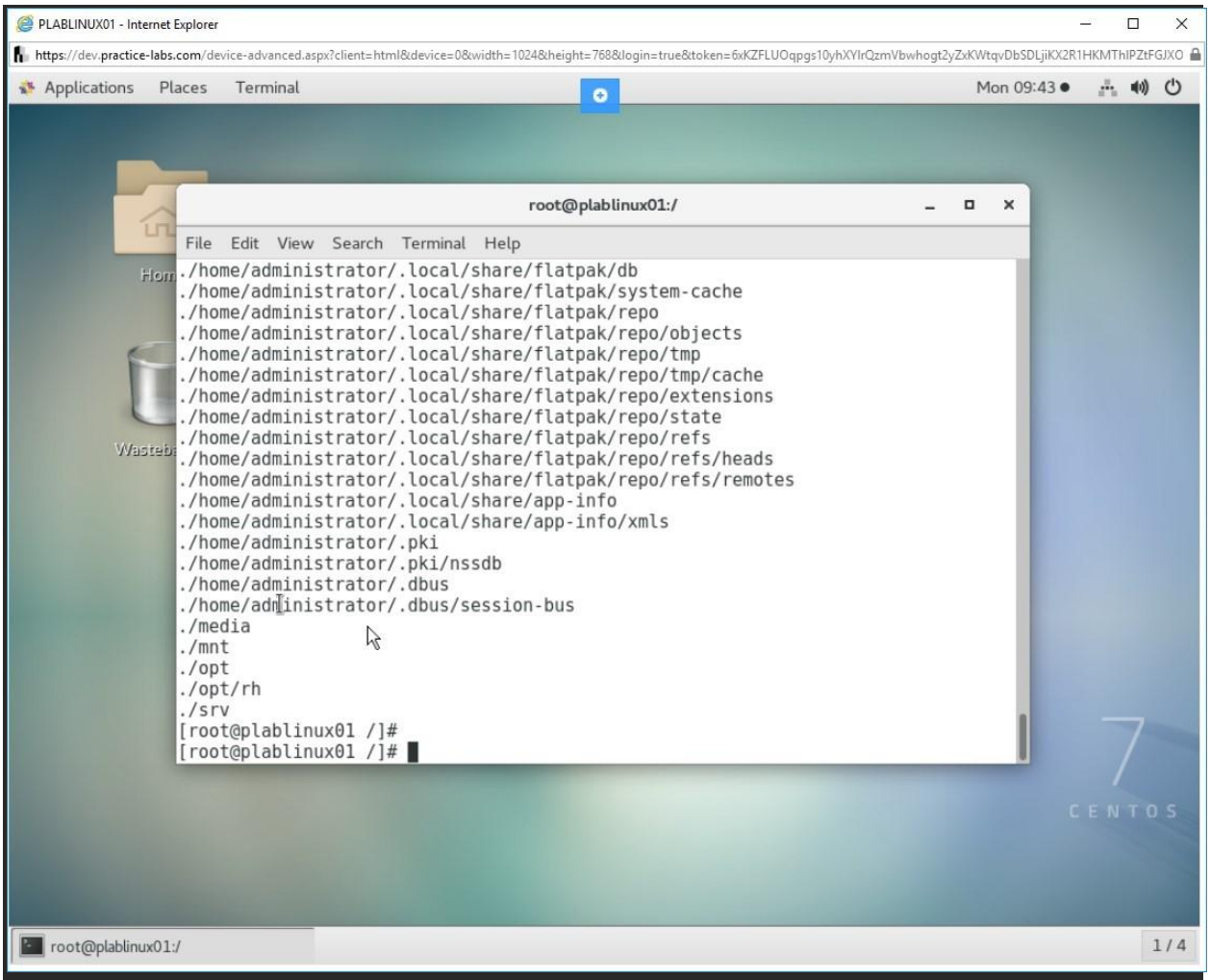

Figure 1.15 Screenshot of PLABLINUX01: Displaying the list of directories in the root directory.

Step 10

Clear the screen by entering the following command:

```
clear
```

Press Enter. Using the find command, you can also find files based on their file size. To find all the files based on their file size, type the following command:

```
find -type f -empty
```

Press Enter.

Note: The empty switch signifies the files with 0 bytes. The -type parameter here allows you to set the search type, which in this case is empty files.

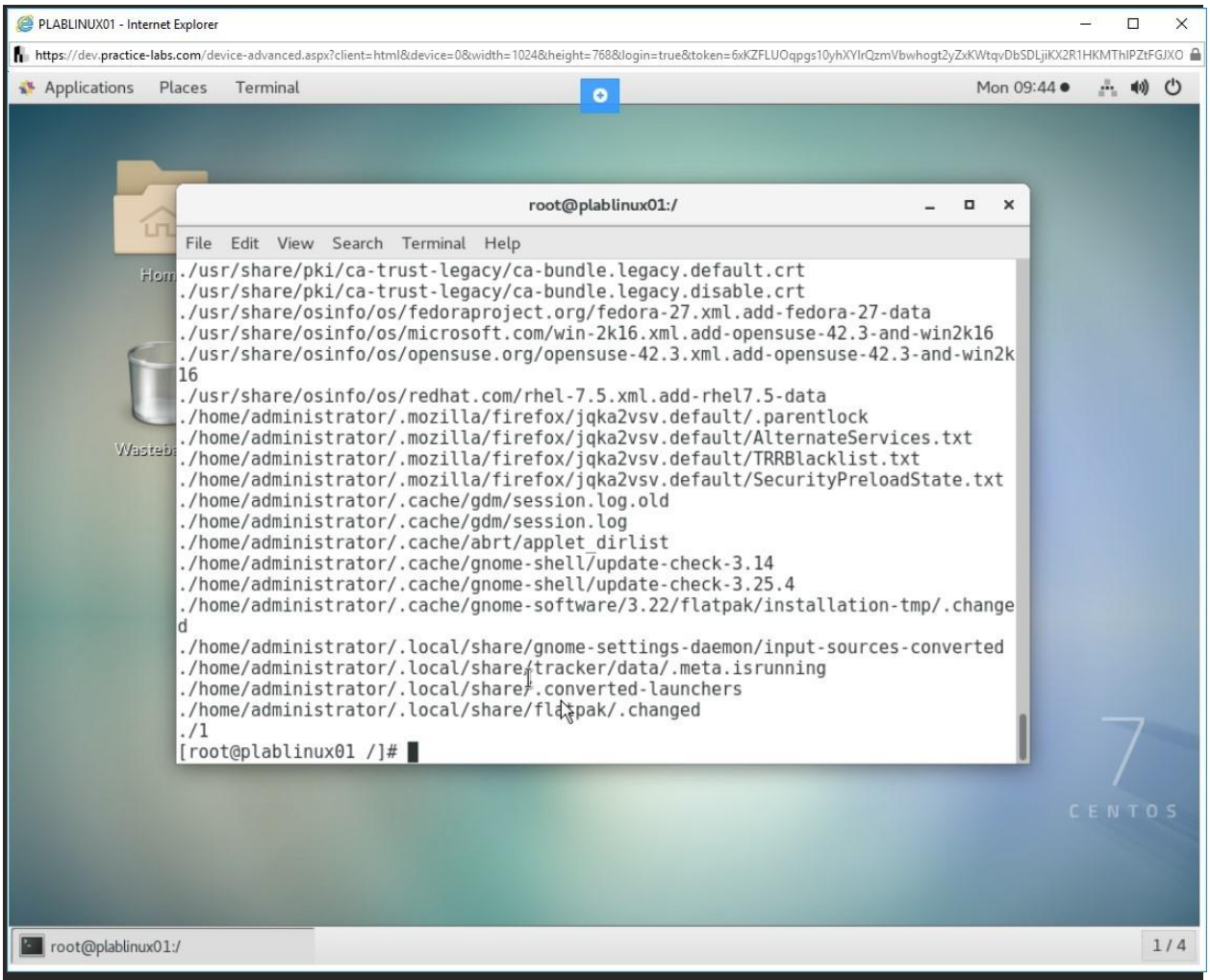

Figure 1.16 Screenshot of PLABLINUX01: Finding the empty files.

Step 11

Clear the screen by entering the following command:

```
clear
```

Press Enter. Using the find command, you can also find files by user and group. For example, to find all the files owned by the user root, type the following command:

```
find /etc -user root
```

Press Enter.

Note that /etc is the name of the directory, which is where you will search for the files. The -user parameter specifies the name of the user, which is root in this case.

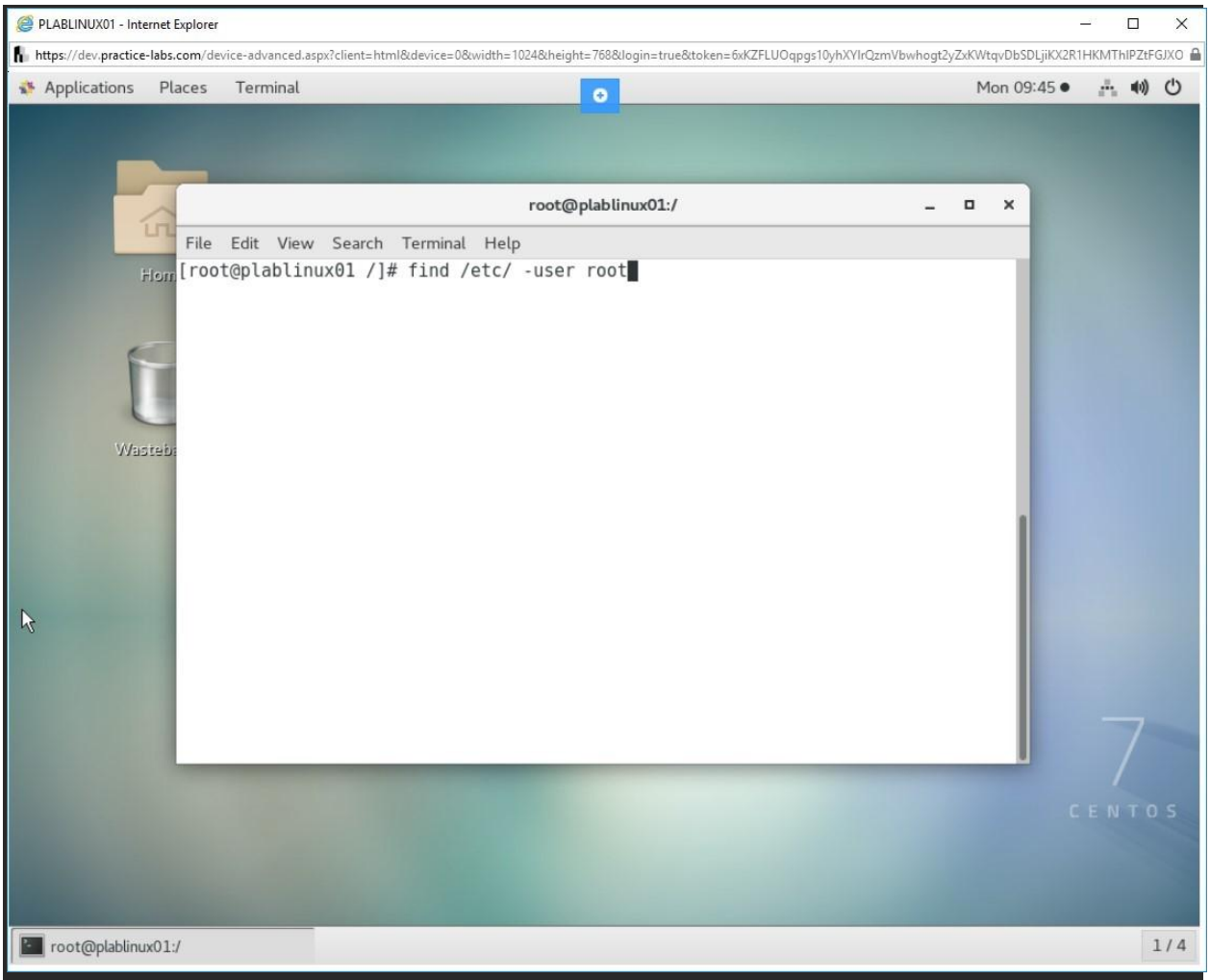

Figure 1.17 Screenshot of PLABLINUX01: Executing the find command on the /etc directory for the root user.

Step 12

The output displays all files on the /etc directory that belong to the user root.

Note: There are a lot more combinations that you can use to find files. The above-shown examples are just a few of them.

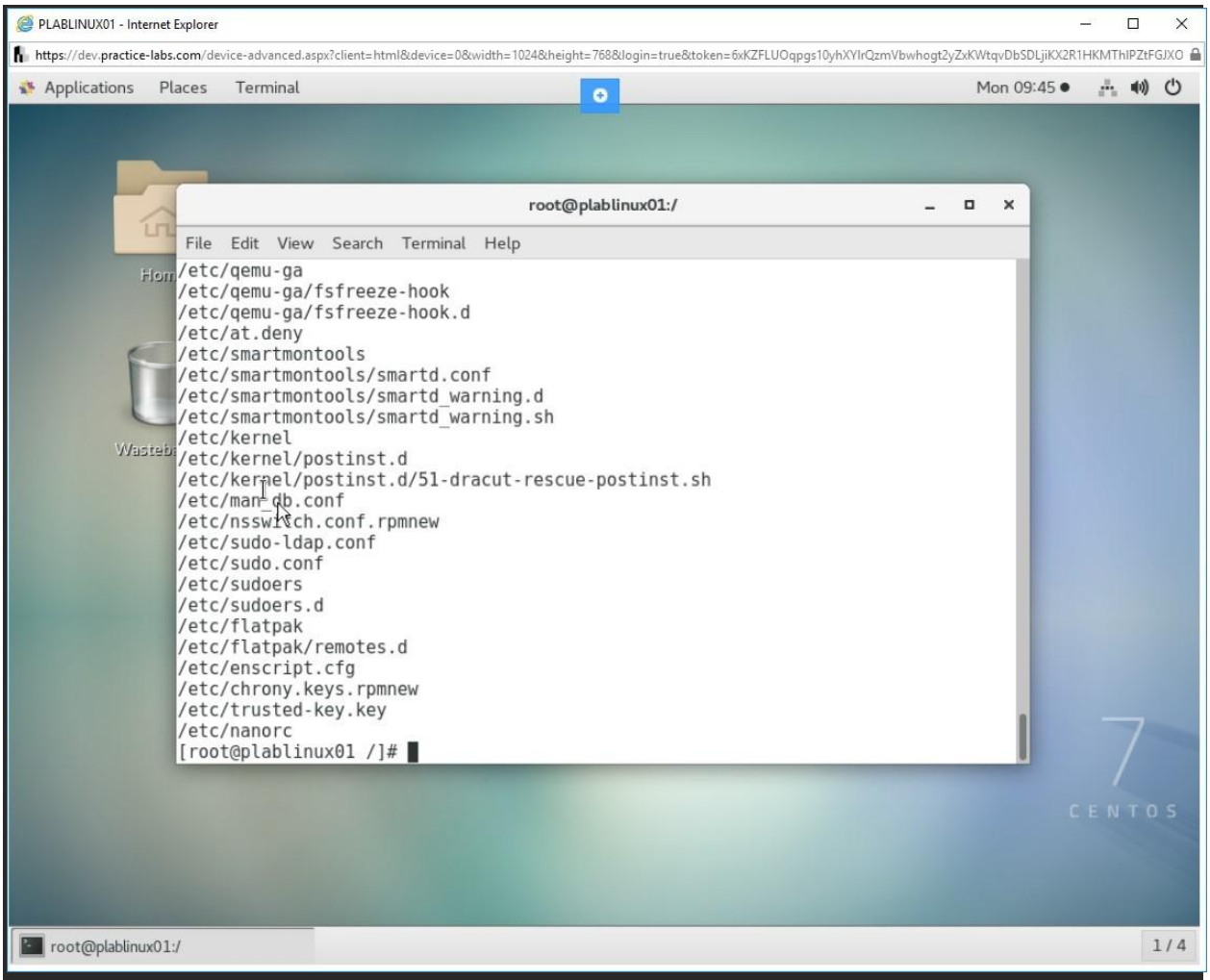

Figure 1.18 Screenshot of PLABLINUX01: Displaying the output of the find command on the /etc directory.

Step 13

Clear the screen by entering the following command:

```
clear
```

Press Enter. When you use the find command, it searches for the files and directories based on a given condition of the filesystem. You can speed up the search using the locate command, which searches the location of files from a specific database.

For example, to find all the files that include “/etc”, as part of their path, type the following command:

```
locate /etc
```

Press Enter.

Note using the locate command, with the /etc filepath will display all the directories on the system the has /etc as part of their filepath.

Note: In case you get an error, run the updatedb command.

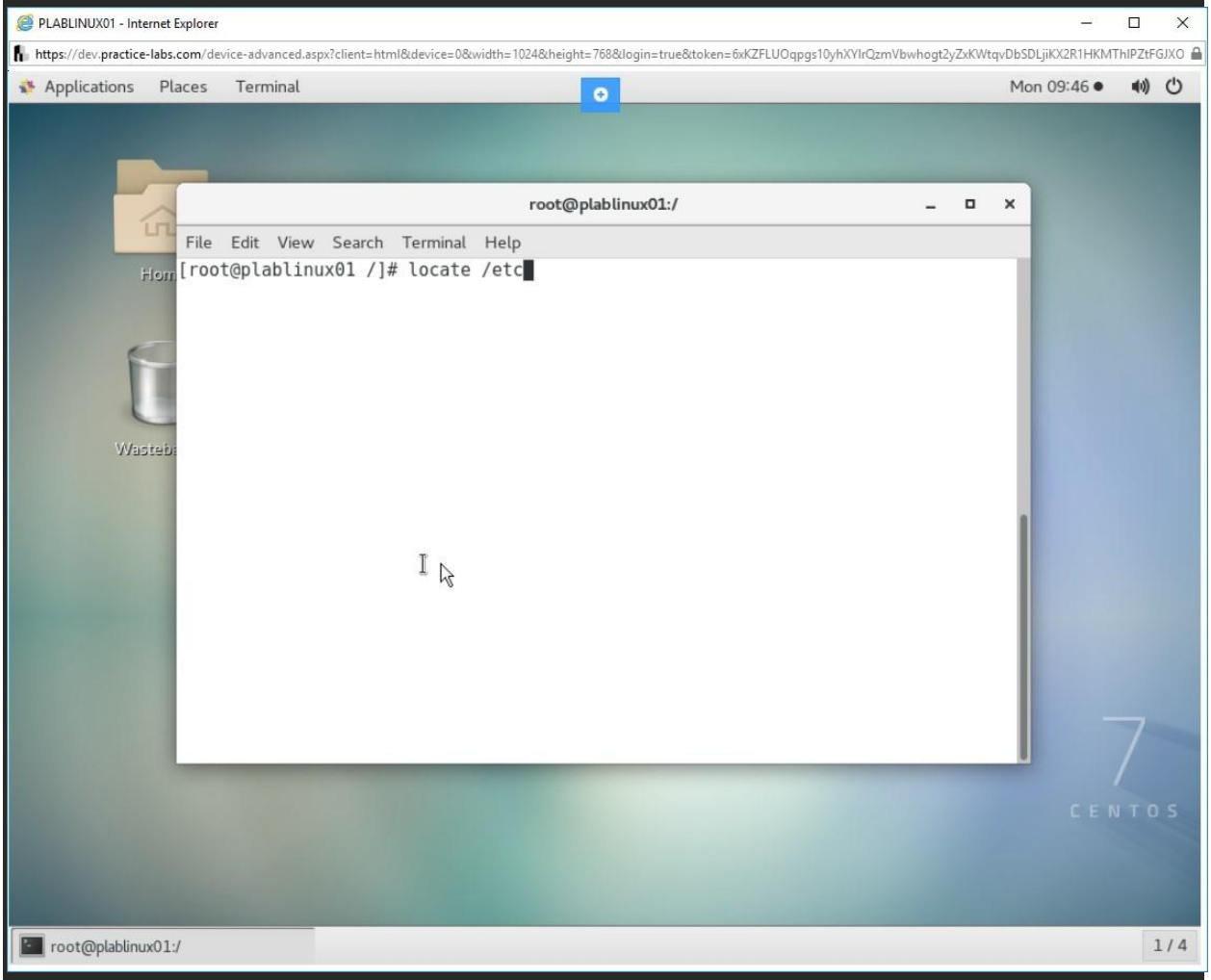

Figure 1.19 Screenshot of PLABLINUX01: Execute the locate command on the /etc directory.

Step 14

Note that all the files that include “/etc” as part of the path are now listed.

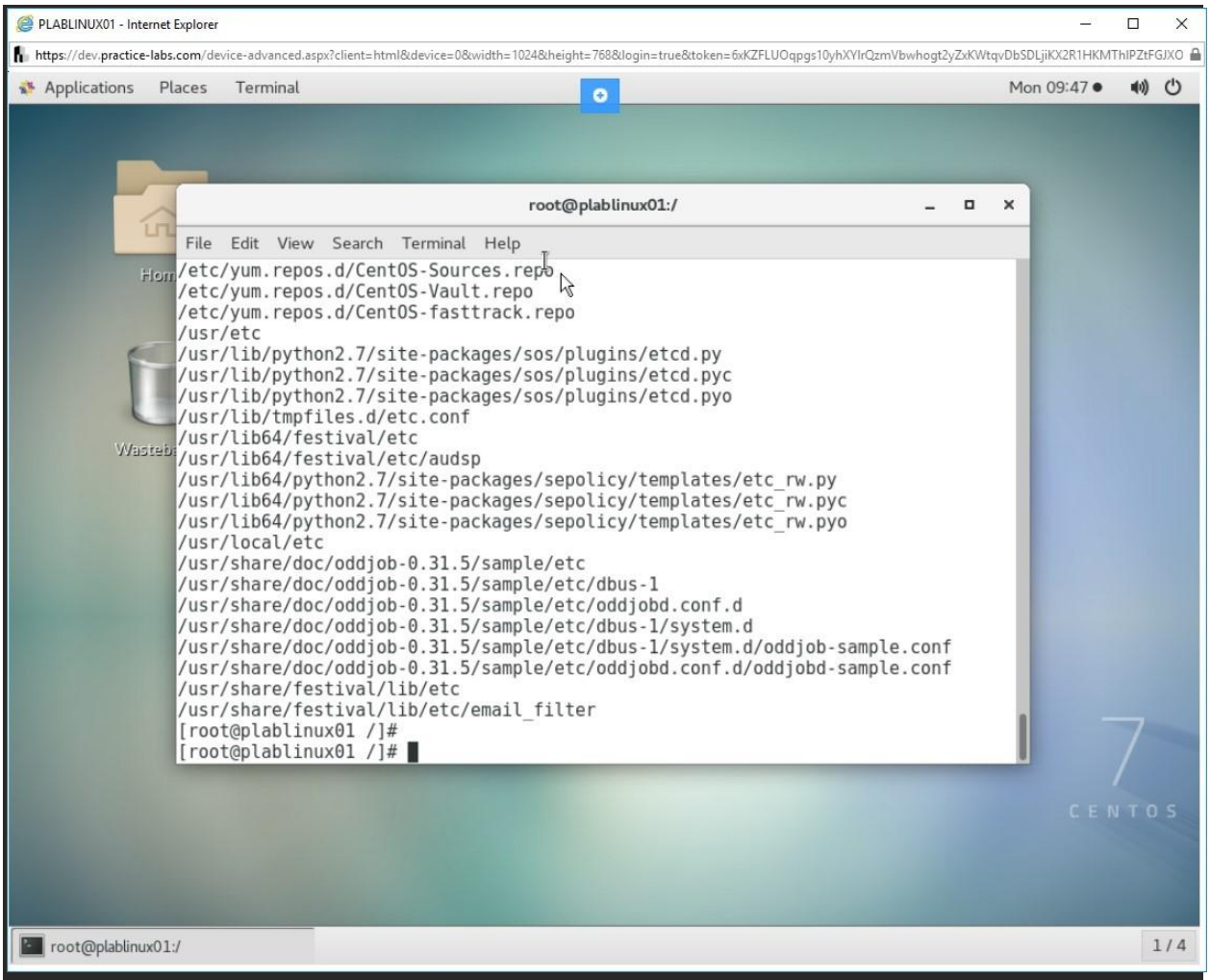

Figure 1.20 Screenshot of PLABLINUX01: Displaying output of the locate command on the /etc directory.

Step 15

Clear the screen by entering the following command:

```
clear
```

Press Enter. You can find the database that locate command uses to find files and directories. To find the location of the database, type the following command:

```
locate -S
```

Press Enter.

The database name is mlocate.db and it is stored in the /var/lib/mlocate directory.

Note: The database may differ in different Linux distributions. For example, in some of the Linux distributions, you may find the database name to be slocate or mlocate.

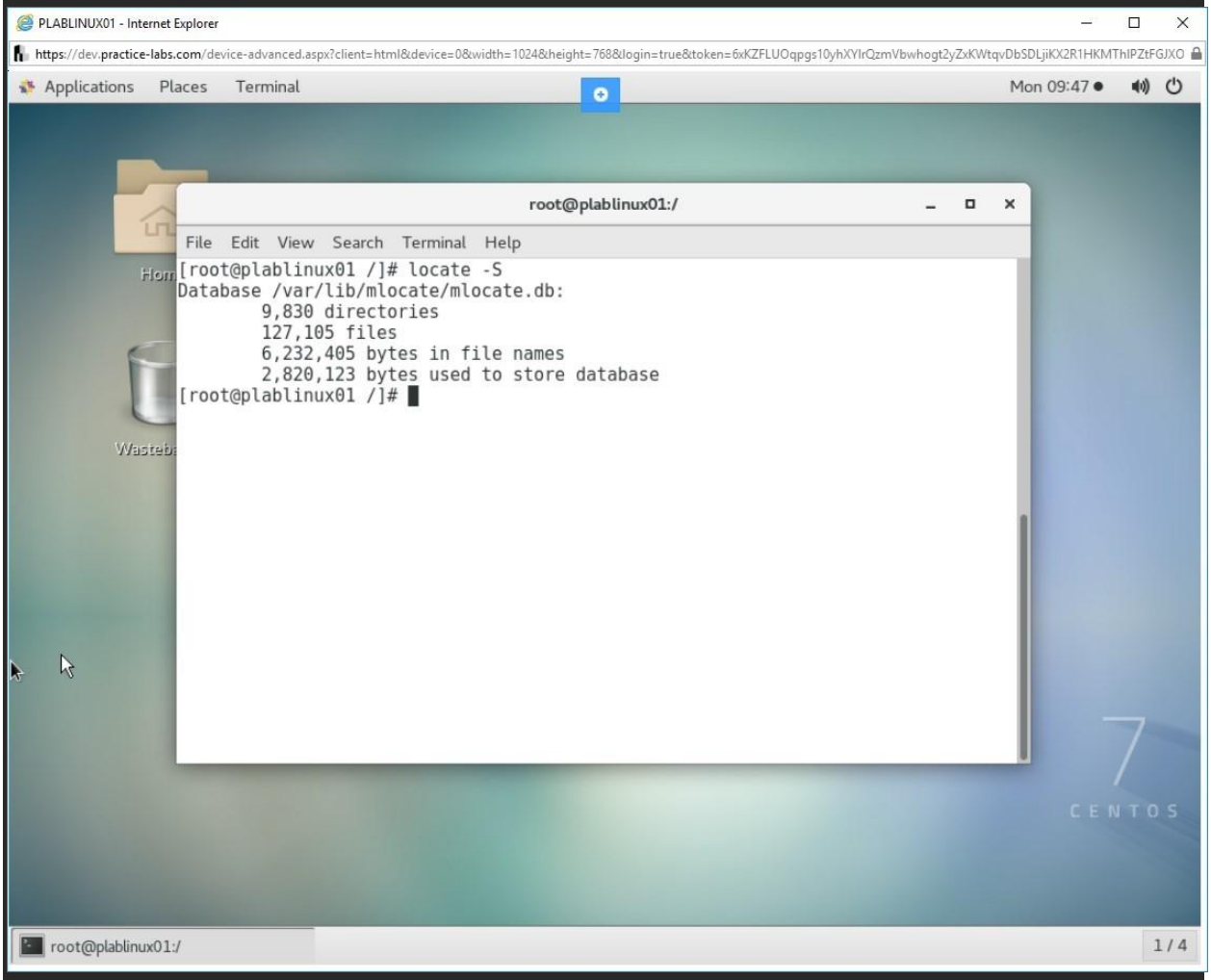

Figure 1.21 Screenshot of PLABLINUX01: Executing the locate -S command and displaying its output.

Step 16

To update the database, type the following command:

```
updatedb
```

Press Enter.

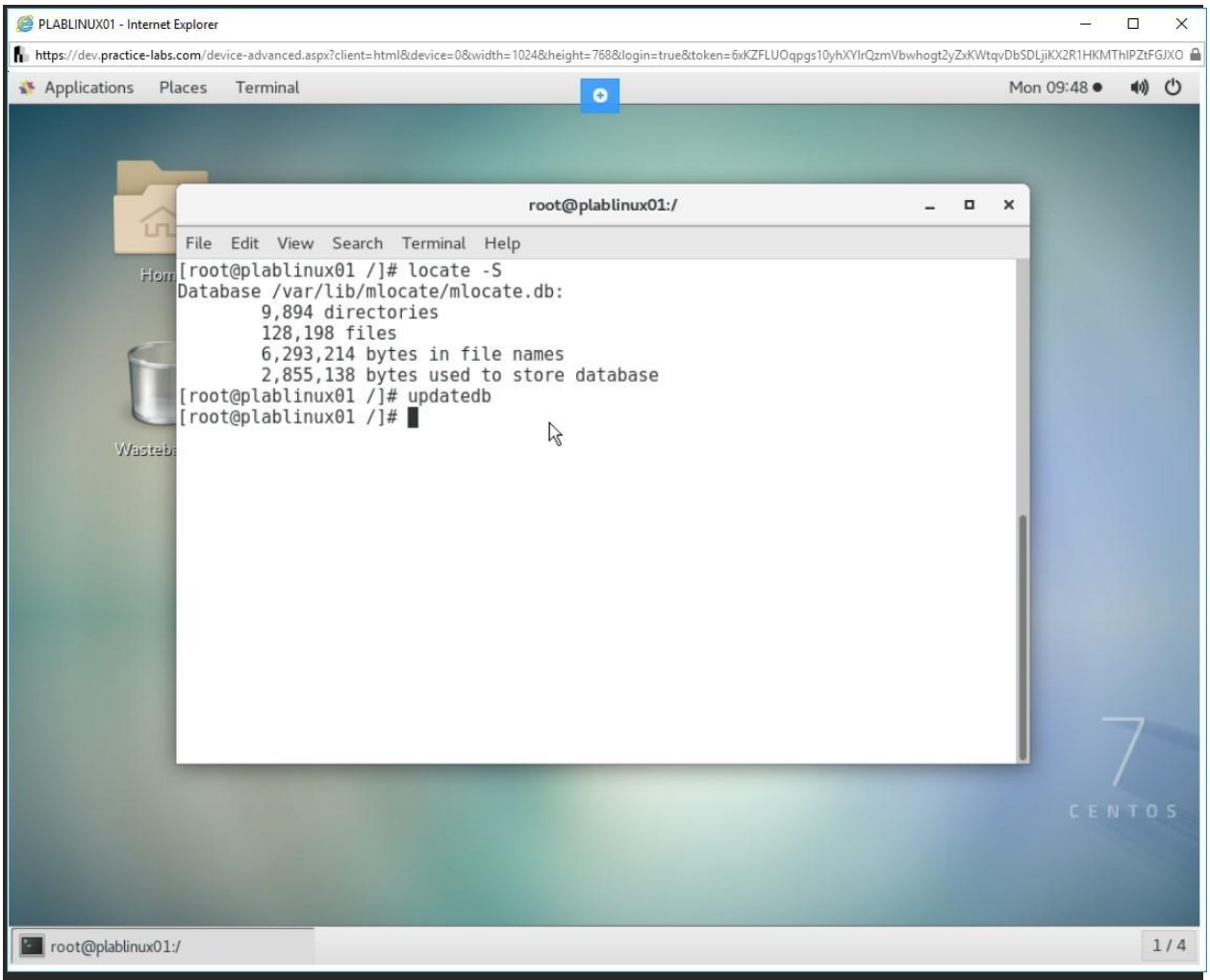

Figure 1.22 Screenshot of PLABLINUX01: Executing the updatedb command.

Step 17

The updatedb command usually runs as a cron job on a daily basis. You can set the DAILY_UPDATE=yes parameter in the /etc/updatedb.conf file if it is not already set.

To view the /etc/updatedb.conf file, type the following command:

```
cat /etc/updatedb.conf
```

Press Enter.

The DAILY_UPDATE=yes parameter is not set. If you want, you can edit the file using the vi editor and set this parameter.

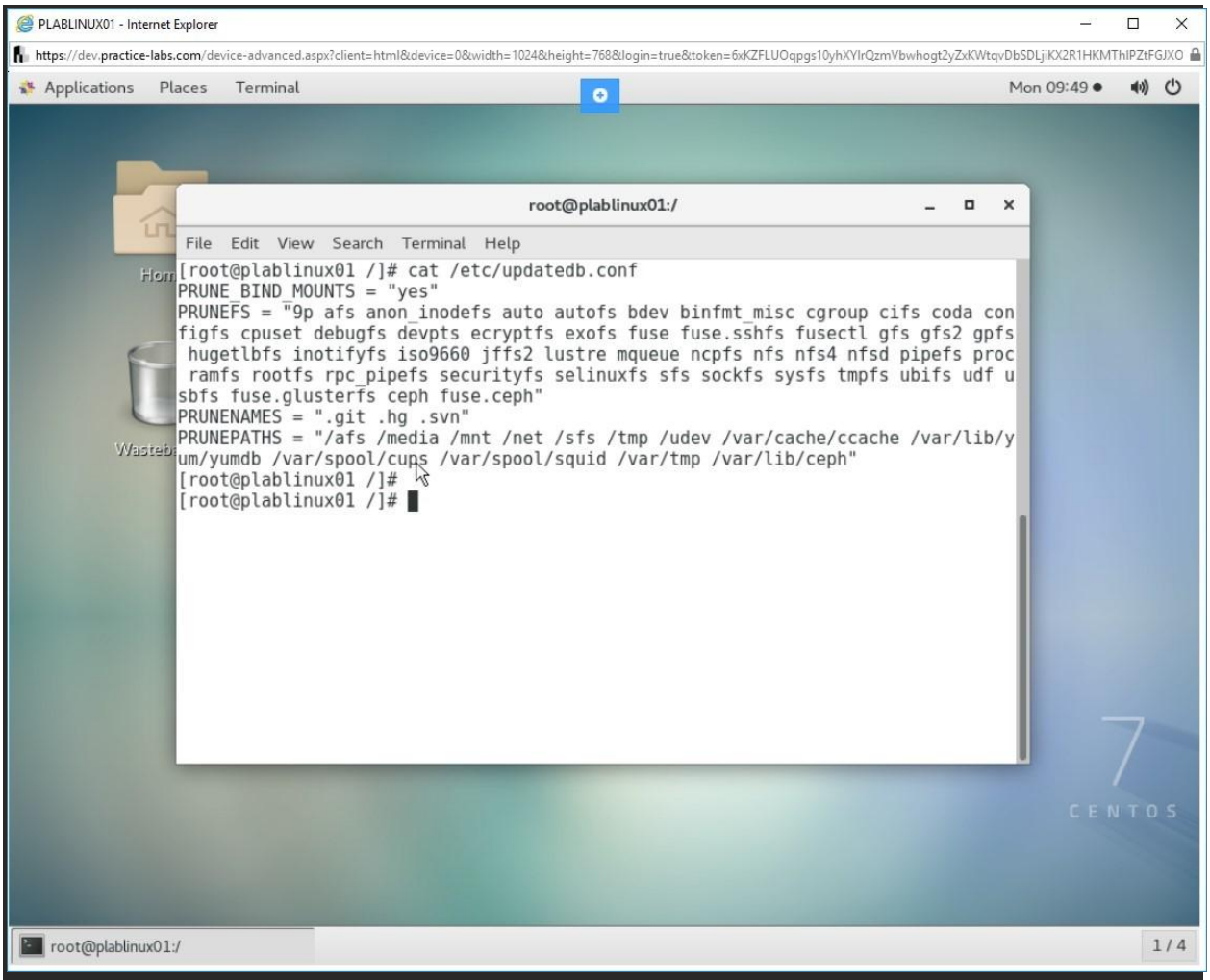

Figure 1.23 Screenshot of PLABLINUX01: Viewing the contents of the /etc/updatedb.conf file.