CompTIA Linux+

Shells, Scripting and Data Management

- **Introduction**
- **Lab Topology**
- **Exercise 1 - Customize and Use the Shell Environment**
- **Exercise 2 - SQL Data Management**
- **Review**

Introduction

Welcome to the **Shells, Scripting and Data Management** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Shells
Scripting
Data Management

Learning Outcomes

In this module, you will complete the following exercises:

- Exercise 1 - Customize and Use the Shell Environment
- Exercise 2 - SQL Data Management

After completing this lab, you will be able to:

- List the profile scripts
- Set environment variables
- Write Bash functions
- Maintain skeleton directories for new user accounts
- Set the command search path with the proper directory
- Install MySQL

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 103.1 Work on the command line
- **LPI:** 105.1 Customize and use the shell environment
- **CompTIA:** 5.1 Given a scenario, deploy and execute basic BASH scripts.

> ***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.

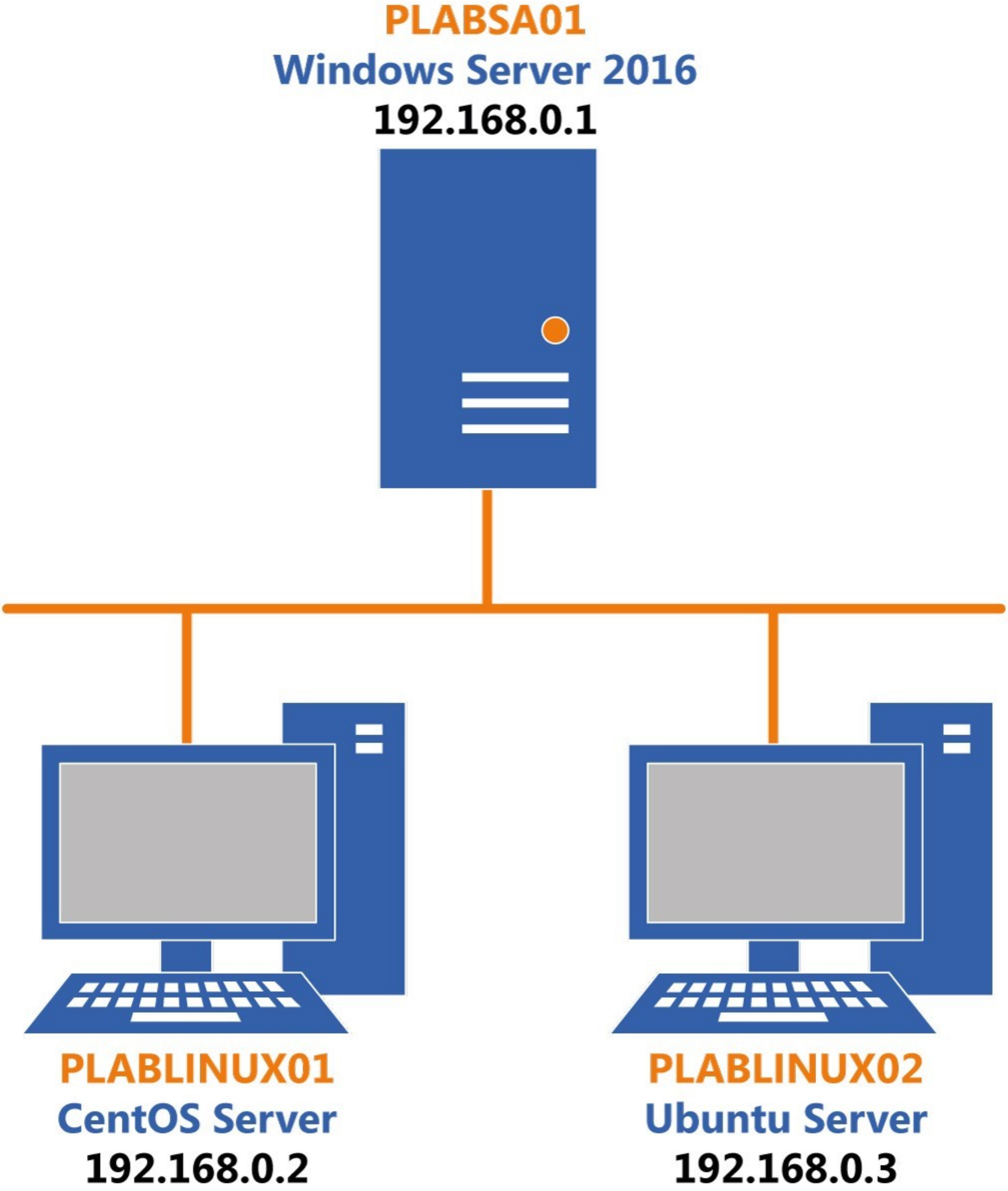
Help and Support

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 - Customize and Use the Shell Environment

Shell environment in Linux is a collection of values given to various parameters accessed by programs and utilities. These values provide the default configuration information to the programs. The programs execute and interact with the environment based on these values. In this exercise, you will understand how to customize and use the shell environment.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- List the profile scripts
- Set environment variables
- Write Bash functions
- Maintain skeleton directories for new user accounts
- Set the command search path with the proper directory

Your Devices

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

- **PLABLINUX01** (CentOS Server)

Task 1 - List the Profile Scripts

In most Linux distributions, the bash shell provides the configuration information for the user ID when a user logs on.

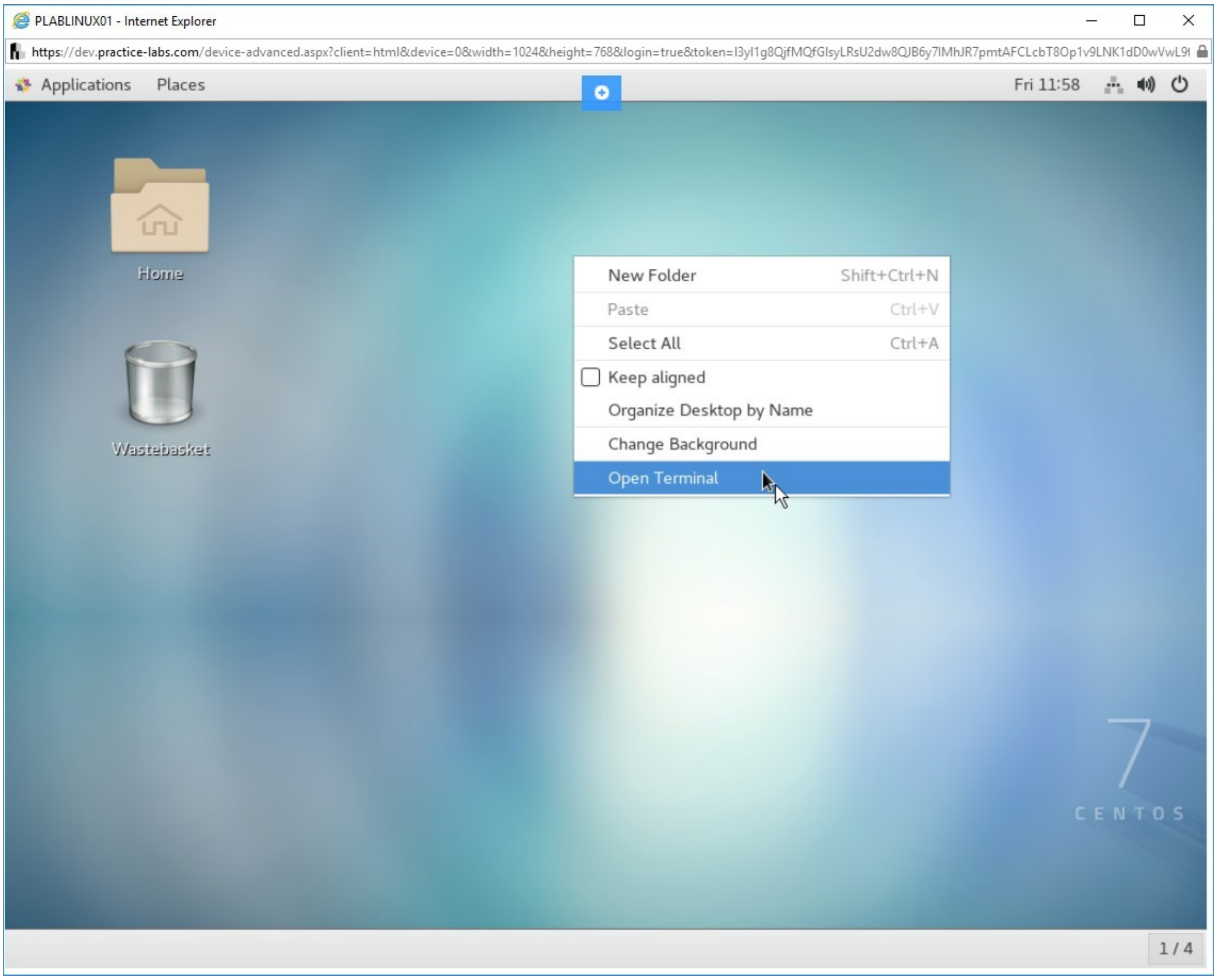
When a user logs in, the bash shell triggers a number of profile scripts before the user is granted the control. These scripts are executed in a fixed order. The order may be the following depending on the Linux distribution:

- /etc/profile
- /etc/bash.bashrc or /etc/bashrc
- Script in the user's home directory: ~/.bash_profile, ~/.bash_login, ~/.profile - they are executed in this order. However, if one script, let’s say ~/bash_profile is not found, the next one is executed.
- ~/.bash_logout - triggered when the user is logging off

In this task, you will list the contents of these scripts on a Linux system. To list the profile scripts, perform the following steps:

Step 1

On the desktop, right-click and select **Open Terminal**.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https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=I3yl1g8QjfMQfGIsyLRsU2dw8QJB6y7IMhJR7pmtAFCLcbT8Op1v9LNK1dD0wVwL9t
Applications
Places
Fri 11:58
Home
Wastebasket
New Folder Shift+Ctrl+N
Paste Ctrl+V
Select All Ctrl+A
□ Keep aligned
Organize Desktop by Name
Change Background
Open Terminal
7
CENTOS
1 / 4

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:

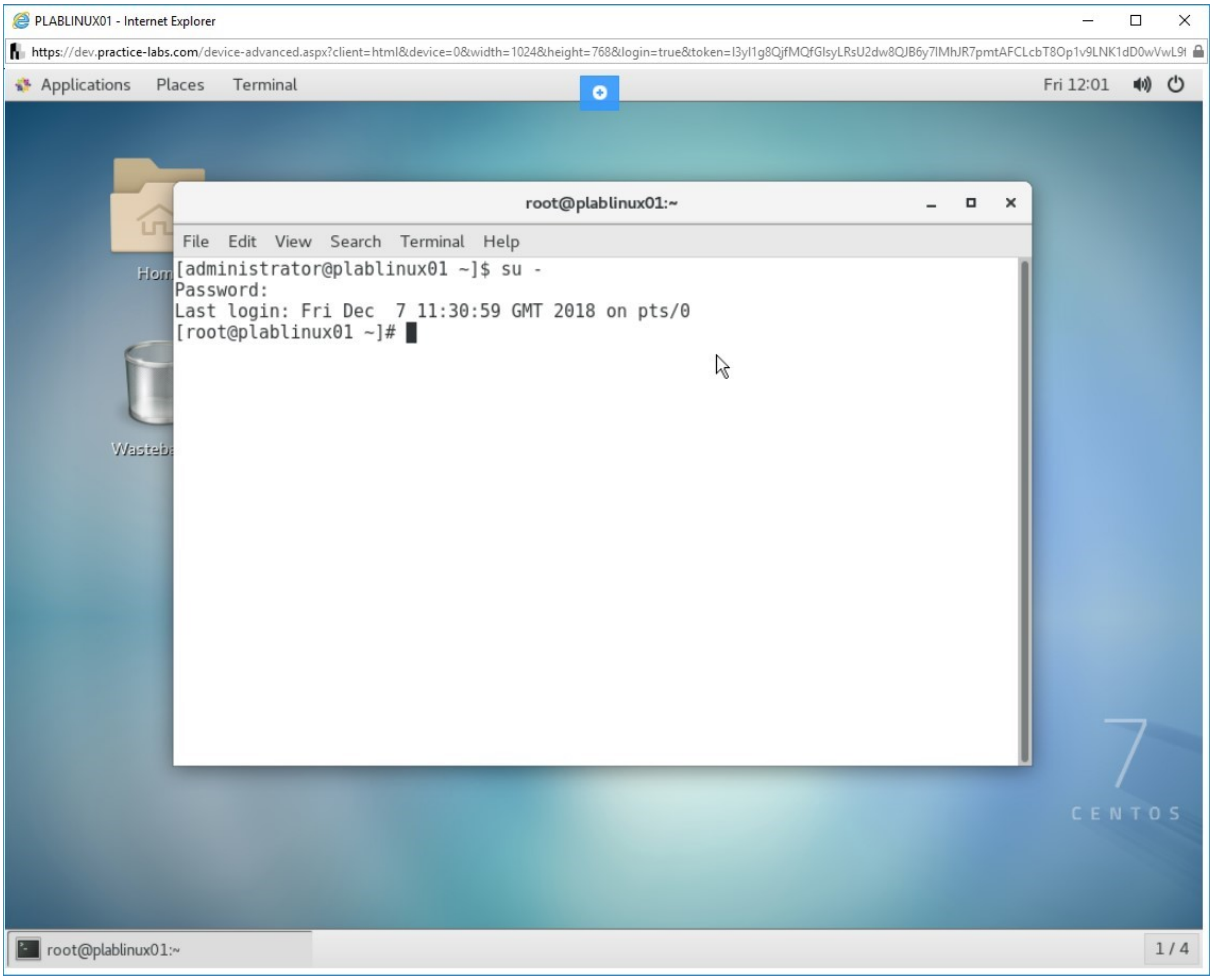
```
su -
```

Press **Enter**.

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

`Passw0rd`

Press **Enter**.



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Applications
Places
Terminal
Fri 12:01
root@plablinux01:~
File
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CENTOS
root@plablinux01:~
1 / 4

```
[administrator@plablinux01 ~]$ su -
Password:
Last login: Fri Dec  7 11:30:59 GMT 2018 on pts/0
[root@plablinux01 ~]#
```

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

Step 3

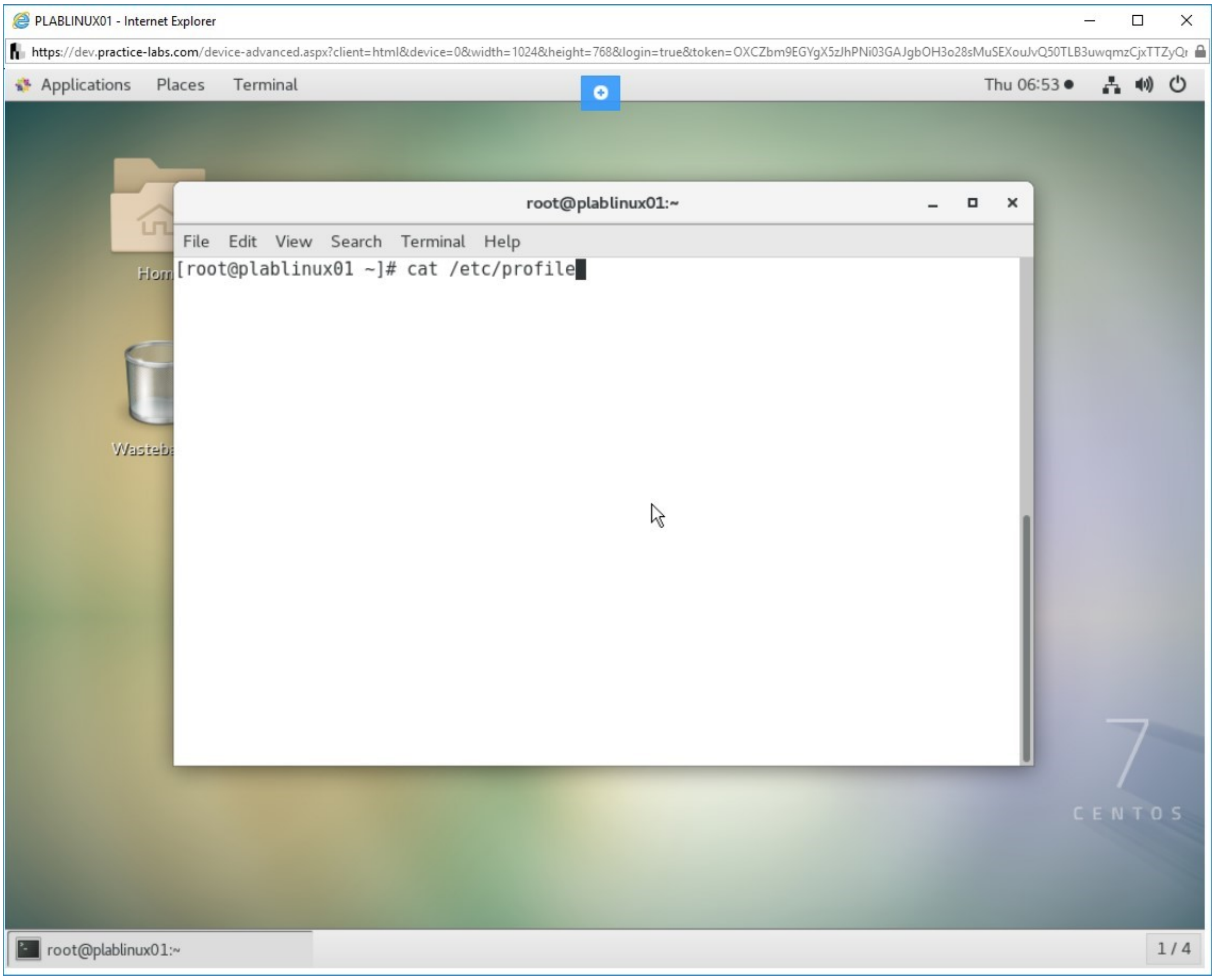
Clear the screen by entering the following command:

```
clear
```

You will first view the global profile, **/etc/profile**, that is used for all users on the system. Type the following command:

```
cat /etc/profile
```

Press **Enter**.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Applications
Places
Terminal
Thu 06:53
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root@plablinux01:~
File
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View
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Terminal
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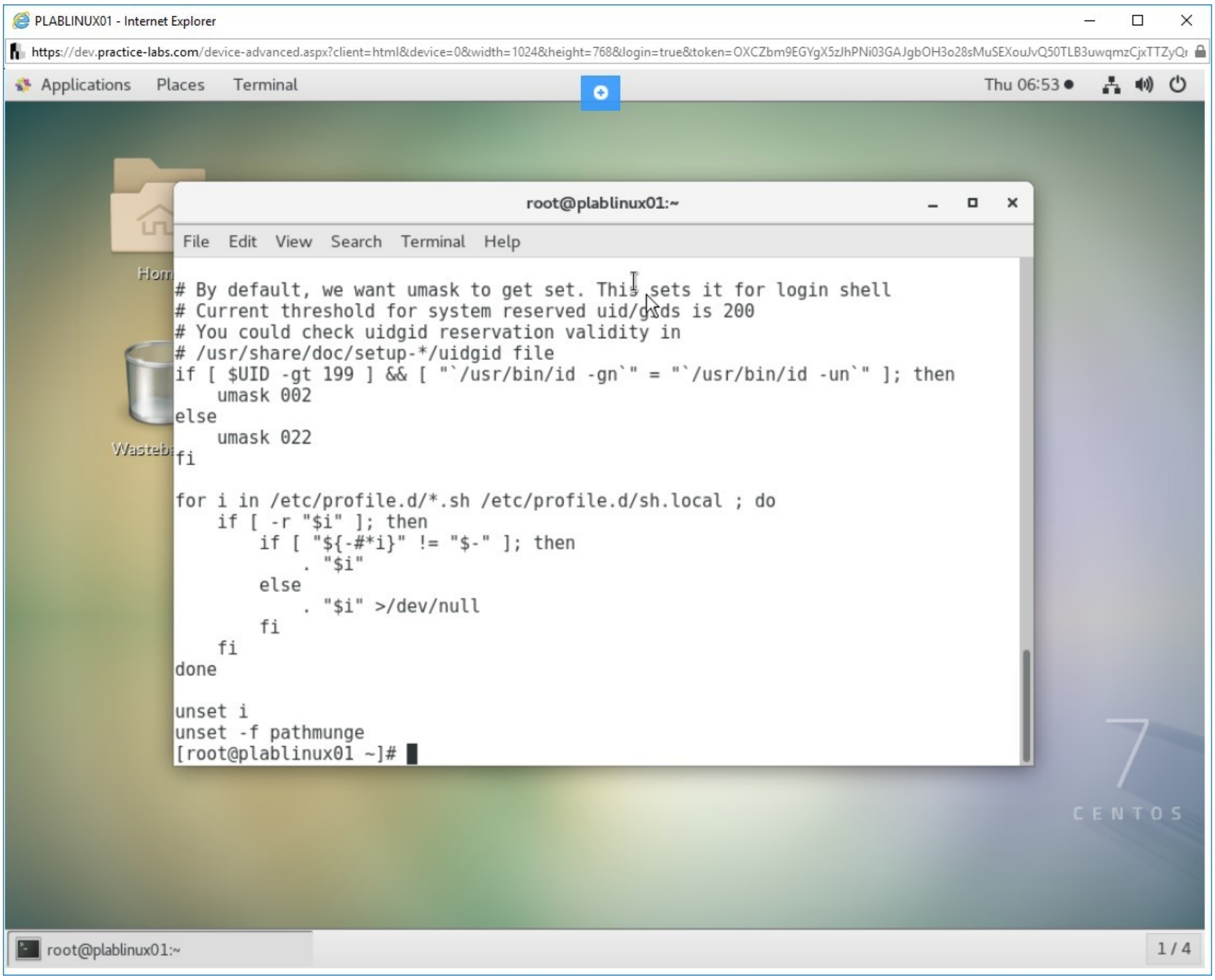
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# cat /etc/profile
```

Figure 1.3 Screenshot of PLABLINUX01: Viewing the /etc/profile file.

Step 4

The **/etc/profile** is displayed.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root@plablinux01:~
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CENTOS
root@plablinux01:~
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```
# By default, we want umask to get set. This sets it for login shell
# Current threshold for system reserved uid/gids is 200
# You could check uidgid reservation validity in
# /usr/share/doc/setup-*/uidgid file
if [ $UID -gt 199 ] && [ "`/usr/bin/id -gn`" = "`/usr/bin/id -un`" ]; then
    umask 002
else
    umask 022
fi

for i in /etc/profile.d/*.sh /etc/profile.d/sh.local ; do
    if [ -r "$i" ]; then
        if [ "${-#*i}" != "$-" ]; then
            . "$i"
        else
            . "$i" >/dev/null
        fi
    fi
done

unset i
unset -f pathmunge
[root@plablinux01 ~]#
```

Figure 1.4 Screenshot of PLABLINUX01: Displaying the contents of the /etc/profile file.

Step 5

Clear the screen by entering the following command:

```
clear
```

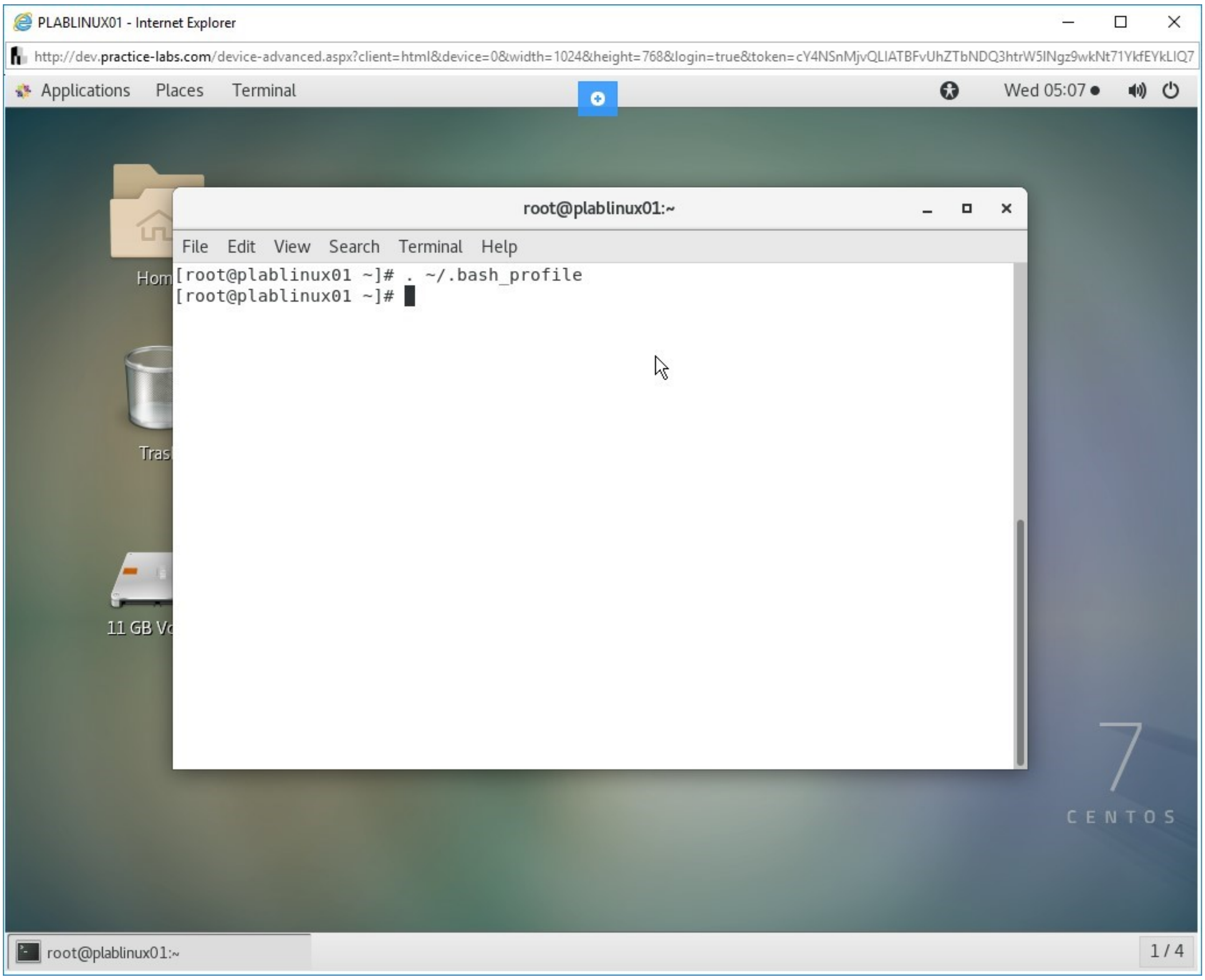
You can load .bash_profile from the command line.

Type the following command:

```
. ~/.bash_profile
```

Press **Enter**.

***Note**: No output is displayed to this command. It loads the bash_profile.*



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root@plablinux01:~
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root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# . ~/.bash_profile
[root@plablinux01 ~]# 
```

Figure 1.5 Screenshot of PLABLINUX01: Loading the current profile.

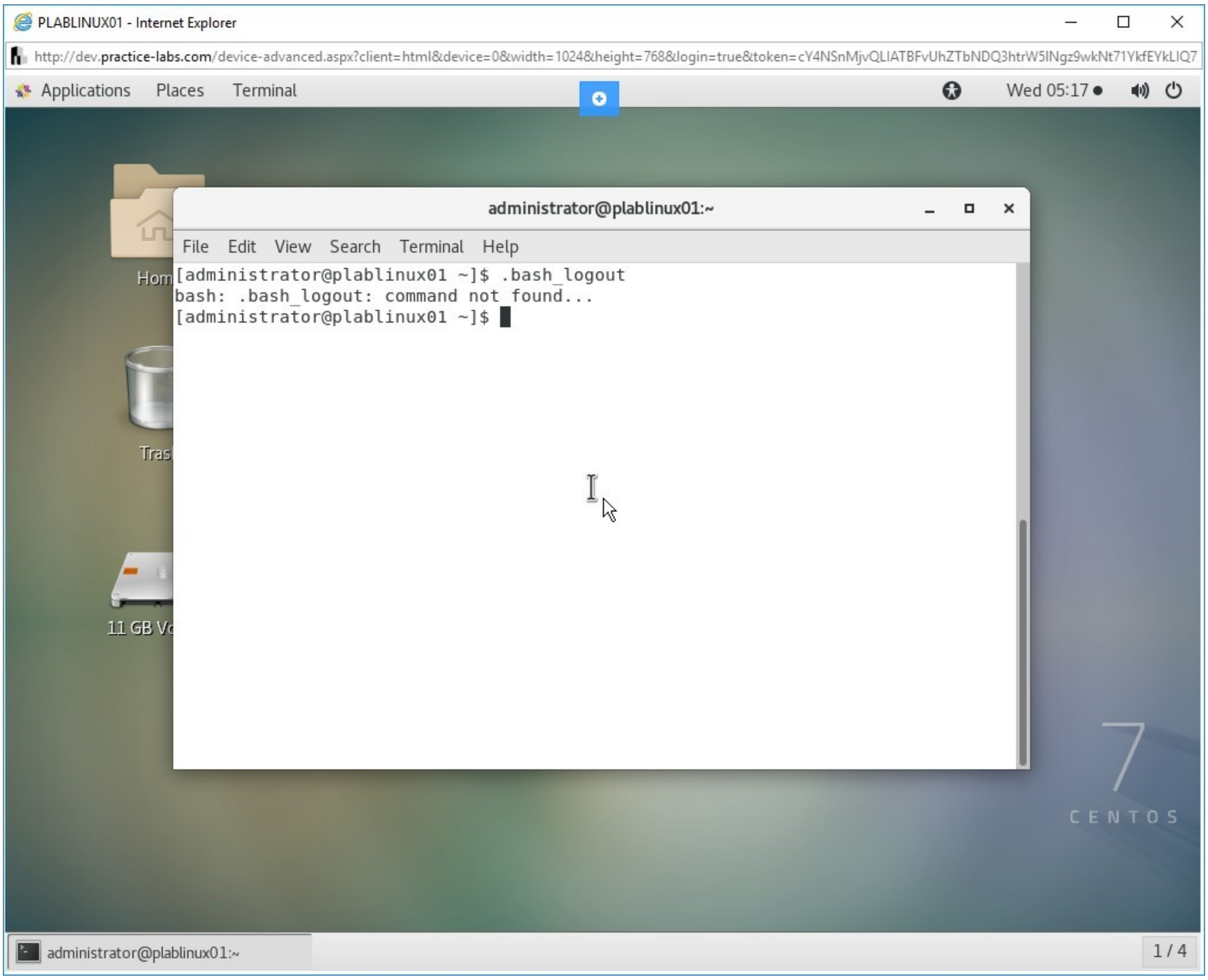
Step 6

The **.bash_logout** file is another file that is login shell cleanup file, which is executed when a login shell exits. Type the following command:

```
.bash_logout
```

Press **Enter**.

> ***Note****: This file does not exist. However, you can create this file with the following sample configuration:*
> *#!/bin/bash*
> *# ~/.bash_logout: executed by bash(1) when login shell exits.*
> *echo 'logout'; sleep 2s*
> *if ["$SHLVL" = 1]; then*
> *history -c*
> *cat /dev/null > ~/.bash_history*
> *[-x /usr/bin/clear_console] && /usr/bin/clear_console -q*
> fi*You can use the vi ~/.bash_logout command to create the .bash_logout file.*



```
[administrator@plablinux01 ~]$ .bash_logout
bash: .bash_logout: command not found...
[administrator@plablinux01 ~]$
```

PLABLINUX01 - Internet Explorer
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administrator@plablinux01:~
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Figure 1.6 Screenshot of PLABLINUX01: Running the login shell clean-up file.

Task 2 - Set Environment Variables

Environment variables are set to default values by the user scripts run when a user logs in. Linux enables you to modify these values. In this task, you will display the values assigned to the variables and then modify these values on a Linux machine.

To set the environment variables, perform the following steps:

Step 1

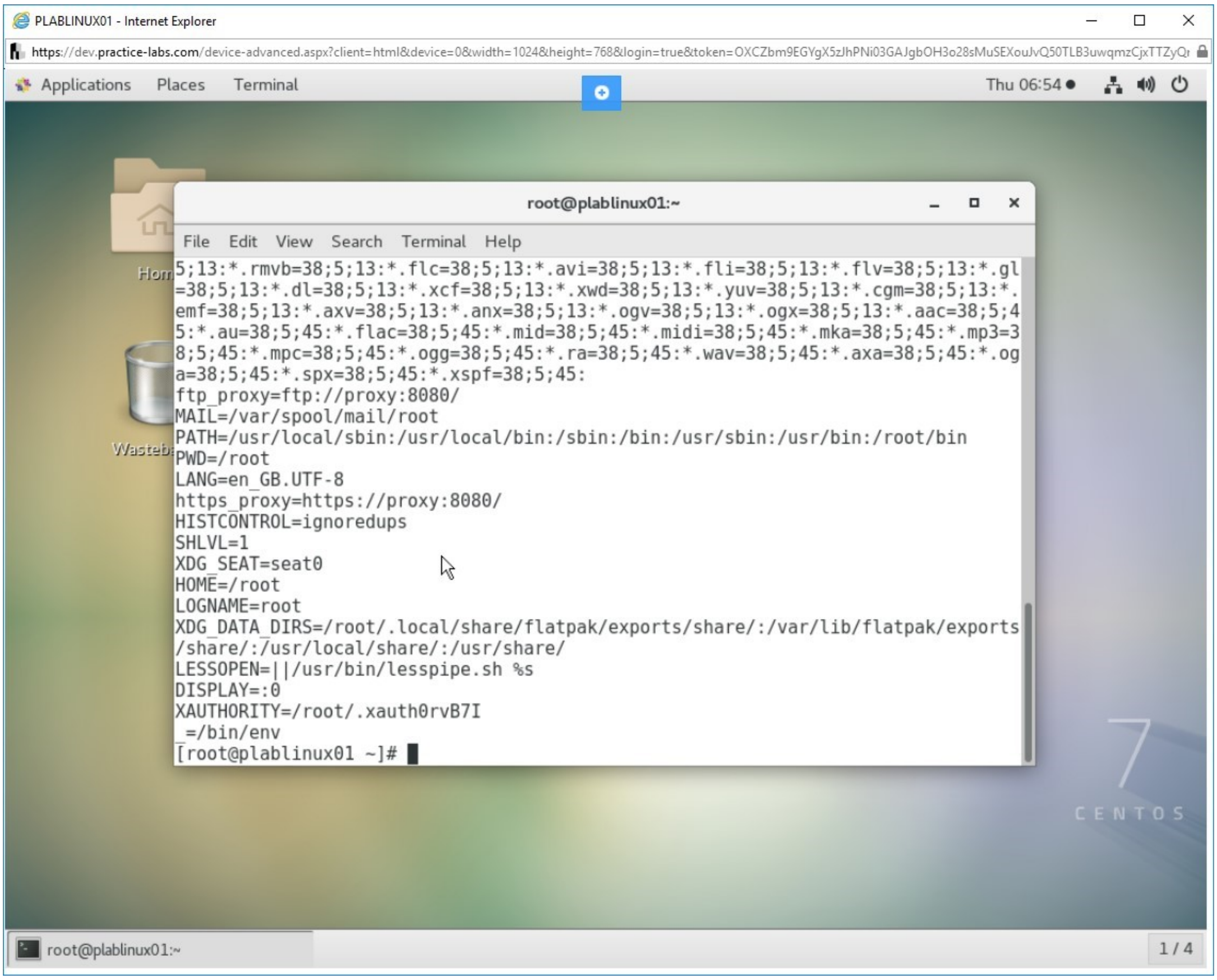
Clear the screen by entering the following command:

```
clear
```

You can also list the environmental variables. Type the following command:

```
env
```

Press **Enter**.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Applications
Places
Terminal
Thu 06:54 ●
root@plablinux01:~
File
Edit
View
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Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
5;13:*.rmvb=38;5;13:*.flc=38;5;13:*.avi=38;5;13:*.fli=38;5;13:*.flv=38;5;13:*.gl
=38;5;13:*.dl=38;5;13:*.xcf=38;5;13:*.xwd=38;5;13:*.yuv=38;5;13:*.cgm=38;5;13:*.
emf=38;5;13:*.axv=38;5;13:*.anx=38;5;13:*.ogv=38;5;13:*.ogx=38;5;13:*.aac=38;5;4
5:*.au=38;5;45:*.flac=38;5;45:*.mid=38;5;45:*.midi=38;5;45:*.mka=38;5;45:*.mp3=3
8;5;45:*.mpc=38;5;45:*.ogg=38;5;45:*.ra=38;5;45:*.wav=38;5;45:*.axa=38;5;45:*.og
a=38;5;45:*.spx=38;5;45:*.xspf=38;5;45:
ftp_proxy=ftp://proxy:8080/
MAIL=/var/spool/mail/root
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin
PWD=/root
LANG=en_GB.UTF-8
https_proxy=https://proxy:8080/
HISTCONTROL=ignoredups
SHLVL=1
XDG_SEAT=seat0
HOME=/root
LOGNAME=root
XDG_DATA_DIRS=/root/.local/share/flatpak/exports/share/:/var/lib/flatpak/exports
/share/:/usr/local/share/:/usr/share/
LESSOPEN=||/usr/bin/lesspipe.sh %s
DISPLAY=:0
XAUTHORITY=/root/.xauth0rvB7I
_=/bin/env
[root@plablinux01 ~]#
```

Figure 1.7 Screenshot of PLABLINUX01: Listing the environment variable.

Step 2

Clear the screen by entering the following command:

```
clear
```

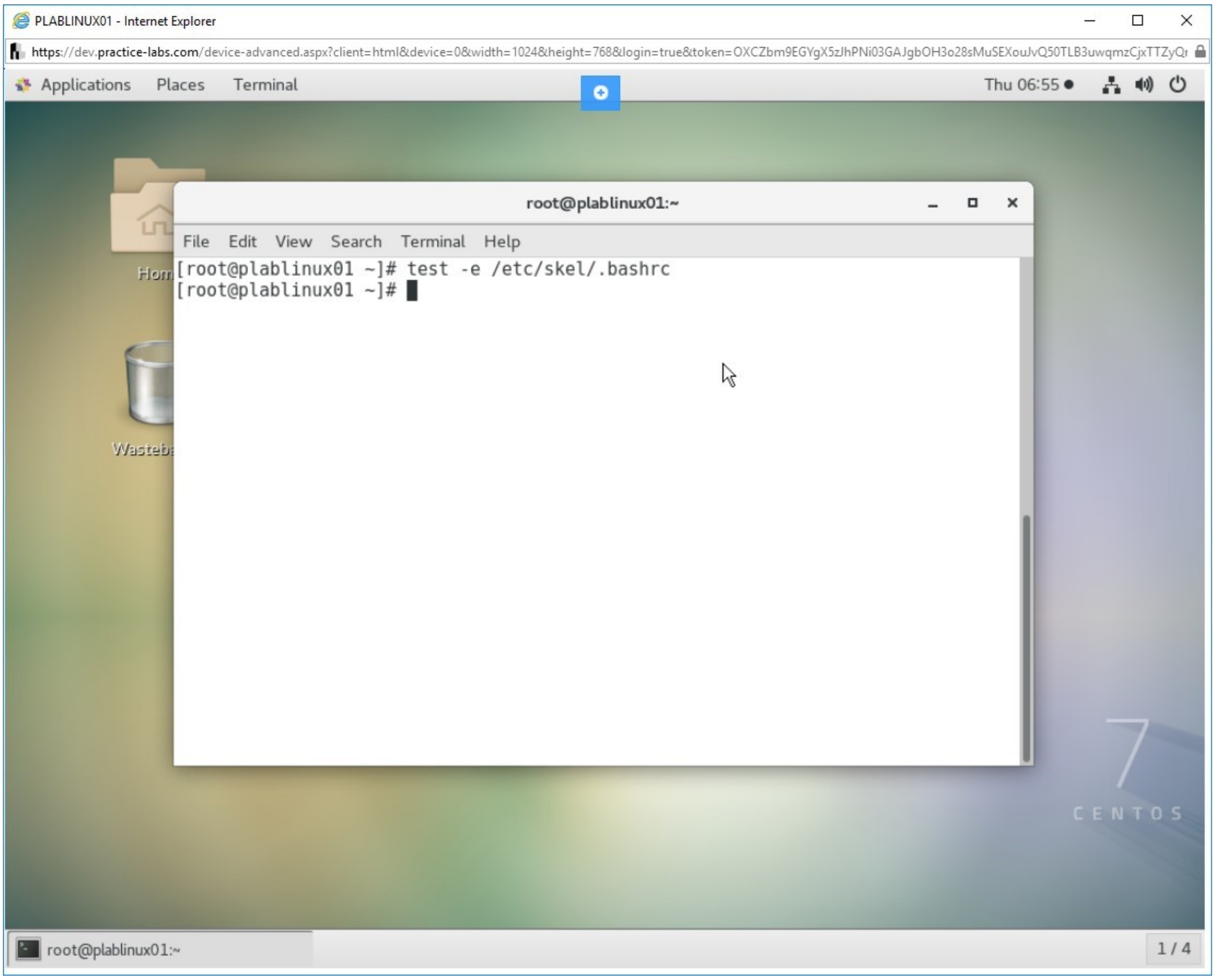
To figure out a number of things about a file, you using the **test** command. For example, you can use the **test** command to check whether the file exists and is it executable.

To check whether the file exists, type the following command:

```
test -e /etc/skel/.bashrc
```

Press **Enter**.

> ***Note***: *No output is displayed to this command.*



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Applications
Places
Terminal
Thu 06:55 ●
root@plablinux01:~
File
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CENTOS
root@plablinux01:~
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```
[root@plablinux01 ~]# test -e /etc/skel/.bashrc
[root@plablinux01 ~]# 
```

Figure 1.8 Screenshot of PLABLINUX01: Checking whether a file exists.

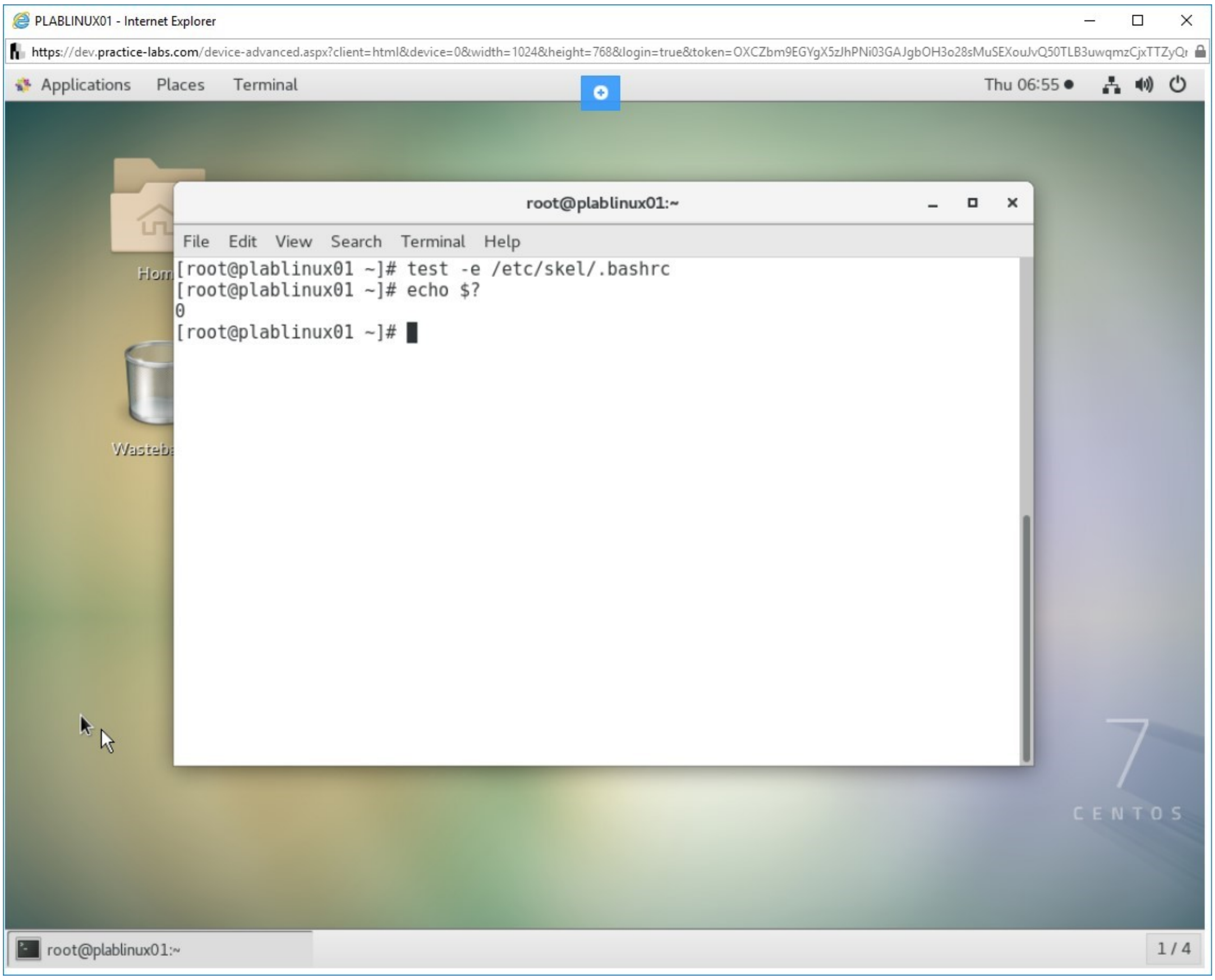
Step 3

To display the output to this command, you use the **echo** command. To display the output of the command, type the following command:

```
echo $?
```

Press **Enter**.

Either **0** or **1** is returned as the value. If the returned value is **0**, then the answer is true. If the returned value is **1**, then the answer is false.



```
[root@plablinux01 ~]# test -e /etc/skel/.bashrc
[root@plablinux01 ~]# echo $?
0
[root@plablinux01 ~]#
```

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root@plablinux01:~
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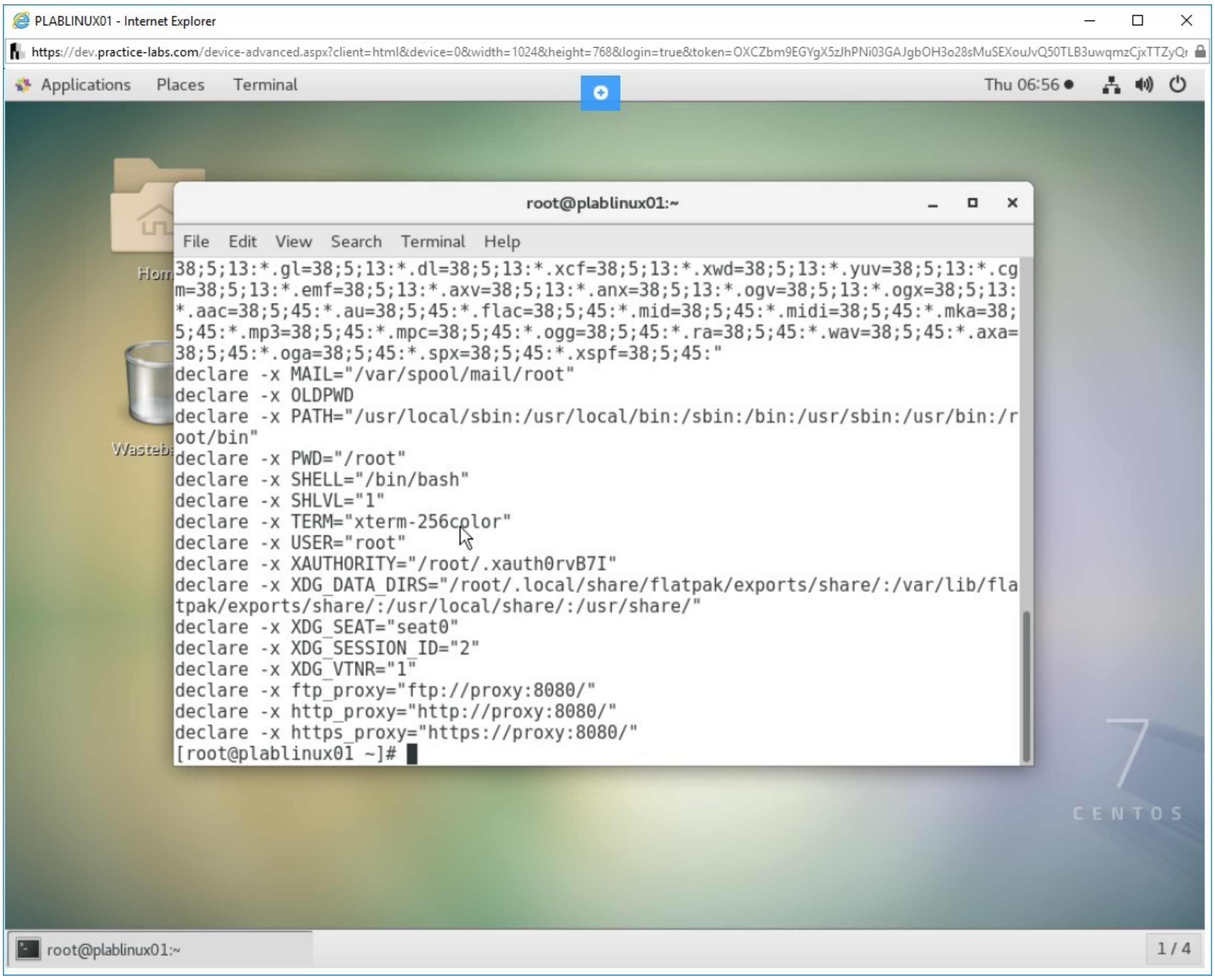
Figure 1.9 Screenshot of PLABLINUX01: Displaying the output of the command.

Step 4

To view all the environmental variables, type the following command:

```
export -p
```

Press **Enter**.



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Applications
Places
Terminal
Thu 06:56 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
38;5;13:*.gl=38;5;13:*.dl=38;5;13:*.xcf=38;5;13:*.xwd=38;5;13:*.yuv=38;5;13:*.cg
m=38;5;13:*.emf=38;5;13:*.axv=38;5;13:*.anx=38;5;13:*.ogv=38;5;13:*.ogx=38;5;13:
*.aac=38;5;45:*.au=38;5;45:*.flac=38;5;45:*.mid=38;5;45:*.midi=38;5;45:*.mka=38;
5;45:*.mp3=38;5;45:*.mpc=38;5;45:*.ogg=38;5;45:*.ra=38;5;45:*.wav=38;5;45:*.axa=
38;5;45:*.oga=38;5;45:*.spx=38;5;45:*.xspf=38;5;45:"
declare -x MAIL="/var/spool/mail/root"
declare -x OLDPWD
declare -x PATH="/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/r
oot/bin"
declare -x PWD="/root"
declare -x SHELL="/bin/bash"
declare -x SHLVL="1"
declare -x TERM="xterm-256color"
declare -x USER="root"
declare -x XAUTHORITY="/root/.xauth0rvB7I"
declare -x XDG_DATA_DIRS="/root/.local/share/flatpak/exports/share/:/var/lib/fla
tpak/exports/share/:/usr/local/share/:/usr/share/"
declare -x XDG_SEAT="seat0"
declare -x XDG_SESSION_ID="2"
declare -x XDG_VTNR="1"
declare -x ftp_proxy="ftp://proxy:8080/"
declare -x http_proxy="http://proxy:8080/"
declare -x https_proxy="https://proxy:8080/"
[root@plablinux01 ~]# 
```

Figure 1.10 Screenshot of PLABLINUX01: Viewing all environment variables.

Step 5

Clear the screen by entering the following command:

```
clear
```

The export command enables you to export variables to be used by other processes.

For example, to set a path, type the following command:

```
export PATH
```

Press **Enter**.

Type the following command:

```
export PATH=$PATH:/usr/local/bin
```

Press **Enter**.

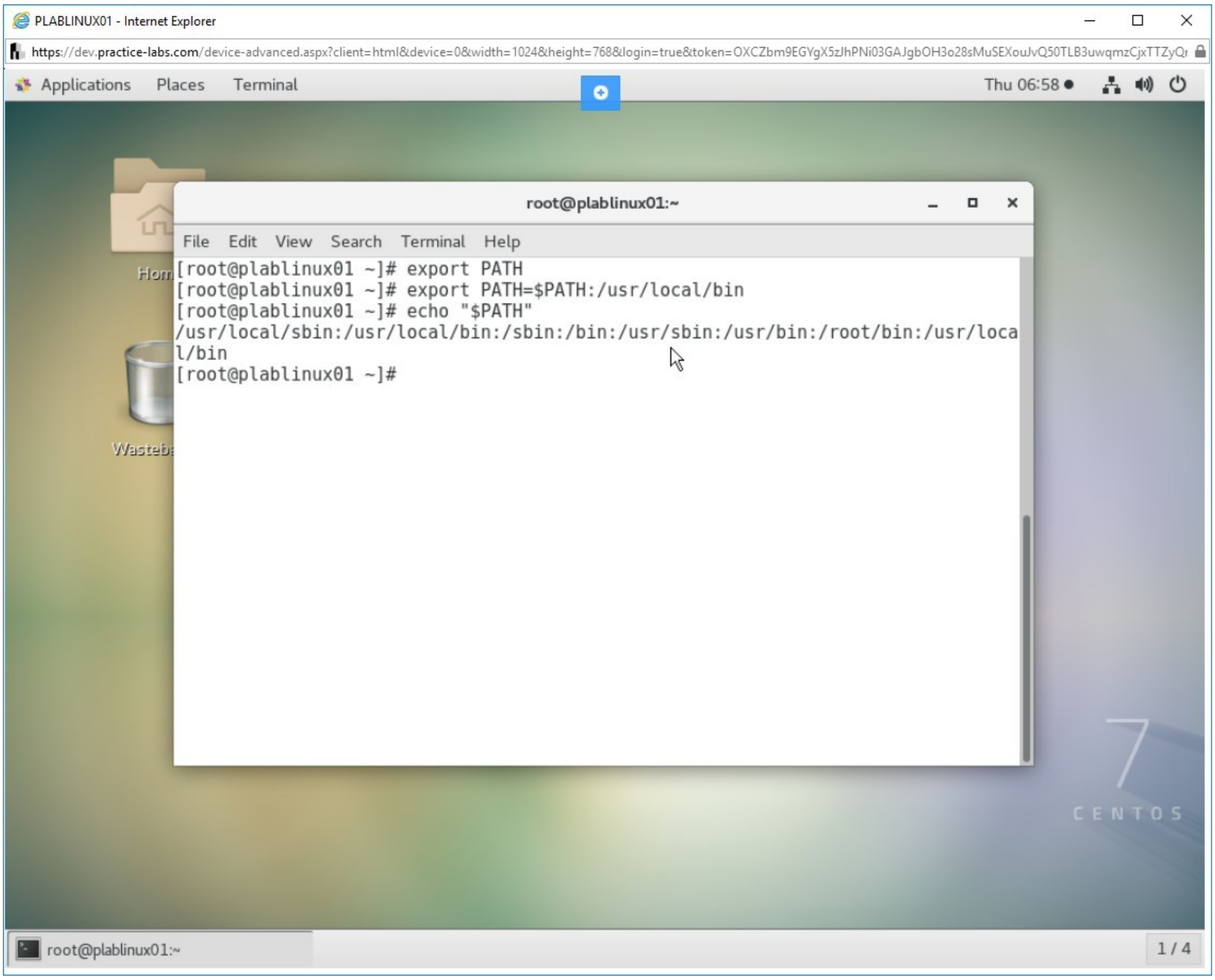
Type the following command:

```
echo "$PATH"
```

Press **Enter**.

> ***Note**: Press **Enter** after every command.*

The path that you had set using the export PATH command is now added to the **$PATH** variable.



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Applications
Places
Terminal
Thu 06:58
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
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CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# export PATH
[root@plablinux01 ~]# export PATH=$PATH:/usr/local/bin
[root@plablinux01 ~]# echo "$PATH"
/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin:/usr/loca
l/bin
[root@plablinux01 ~]#
```

Figure 1.11 Screenshot of PLABLINUX01: Setting and displaying the path.

Task 3 - Write Bash Functions

You can use functions to trigger a number of commands. A function is a series of commands that can be executed by referring to the function name. Writing bash functions for the frequently used commands enables you to execute these multiple commands by issuing one command that calls the relevant bash function. You can define functions to execute in the **/etc/skel/.bashrc** file. In this task, you will write a bash function.

To write bash functions, perform the following steps:

Step 1

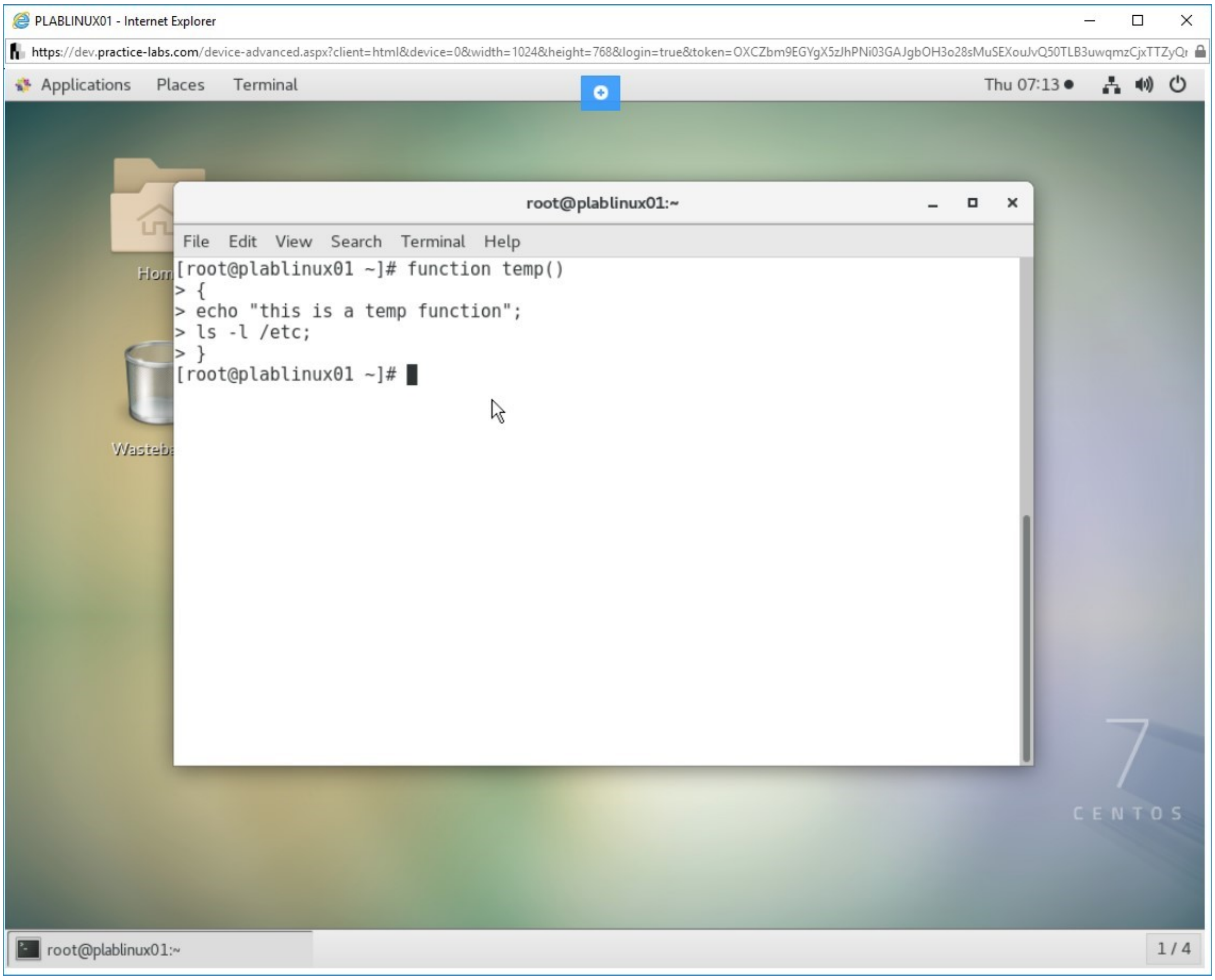
Clear the screen by entering the following command:

```
clear
```

To write a bash function, type the following commands:

```
function temp ()
{
echo "this is a temp function";
ls -l /etc;
}
```

Press **Enter** after every command.



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Terminal
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root@plablinux01:~
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CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# function temp()
> {
> echo "this is a temp function";
> ls -l /etc;
> }
[root@plablinux01 ~]# 
```

Figure 1.12 Screenshot of PLABLINUX01: Writing a bash function.

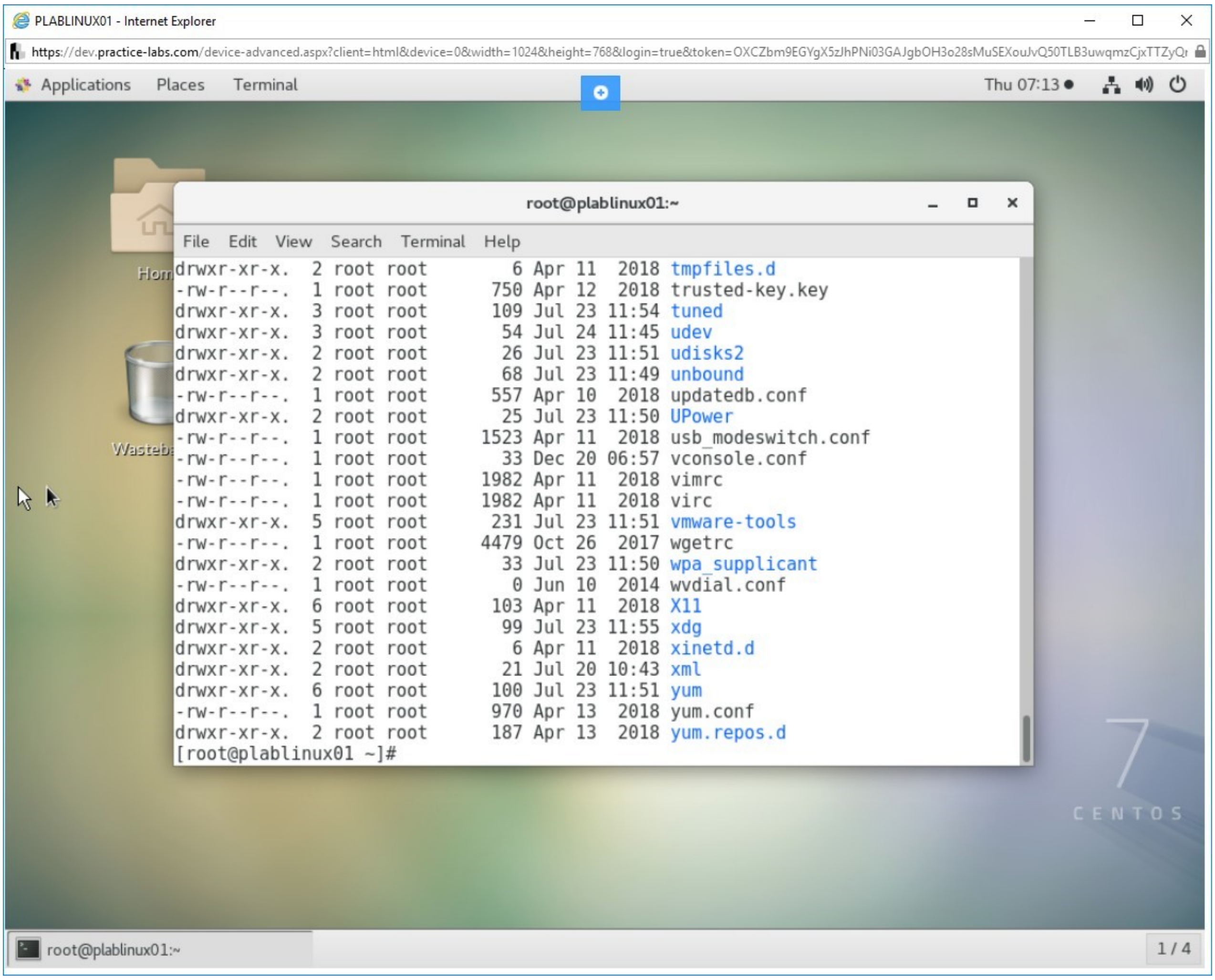
Step 2

To run the function, type the following command:

```
temp
```

Press **Enter**.

The **temp** function displays the directory listing of the **/etc** directory.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root@plablinux01:~
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Terminal
Help
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Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
drwxr-xr-x.  2 root root       6 Apr 11  2018 tmpfiles.d
-rw-r--r--.  1 root root     750 Apr 12  2018 trusted-key.key
drwxr-xr-x.  3 root root     109 Jul 23 11:54 tuned
drwxr-xr-x.  3 root root      54 Jul 24 11:45 udev
drwxr-xr-x.  2 root root      26 Jul 23 11:51 udisks2
drwxr-xr-x.  2 root root      68 Jul 23 11:49 unbound
-rw-r--r--.  1 root root     557 Apr 10  2018 updatedb.conf
drwxr-xr-x.  2 root root      25 Jul 23 11:50 UPower
-rw-r--r--.  1 root root    1523 Apr 11  2018 usb_modeswitch.conf
-rw-r--r--.  1 root root      33 Dec 20 06:57 vconsole.conf
-rw-r--r--.  1 root root    1982 Apr 11  2018 vimrc
-rw-r--r--.  1 root root    1982 Apr 11  2018 virc
drwxr-xr-x.  5 root root     231 Jul 23 11:51 vmware-tools
-rw-r--r--.  1 root root    4479 Oct 26  2017 wgetrc
drwxr-xr-x.  2 root root      33 Jul 23 11:50 wpa_supplicant
-rw-r--r--.  1 root root       0 Jun 10  2014 wvdial.conf
drwxr-xr-x.  6 root root     103 Apr 11  2018 X11
drwxr-xr-x.  5 root root      99 Jul 23 11:55 xdg
drwxr-xr-x.  2 root root       6 Apr 11  2018 xinetd.d
drwxr-xr-x.  2 root root      21 Jul 20 10:43 xml
drwxr-xr-x.  6 root root     100 Jul 23 11:51 yum
-rw-r--r--.  1 root root     970 Apr 13  2018 yum.conf
drwxr-xr-x.  2 root root     187 Apr 13  2018 yum.repos.d
[root@plablinux01 ~]#
```

Figure 1.13 Screenshot of PLABLINUX01: Executing the temp function.

Task 4 - View Skeleton Directories for New User Accounts

When you create a user in Linux, the login and logout scripts are stored in the **/etc/skel** directory. To maintain the skeleton directories for new user accounts, perform the following steps:

Step 1

Clear the screen by entering the following command:

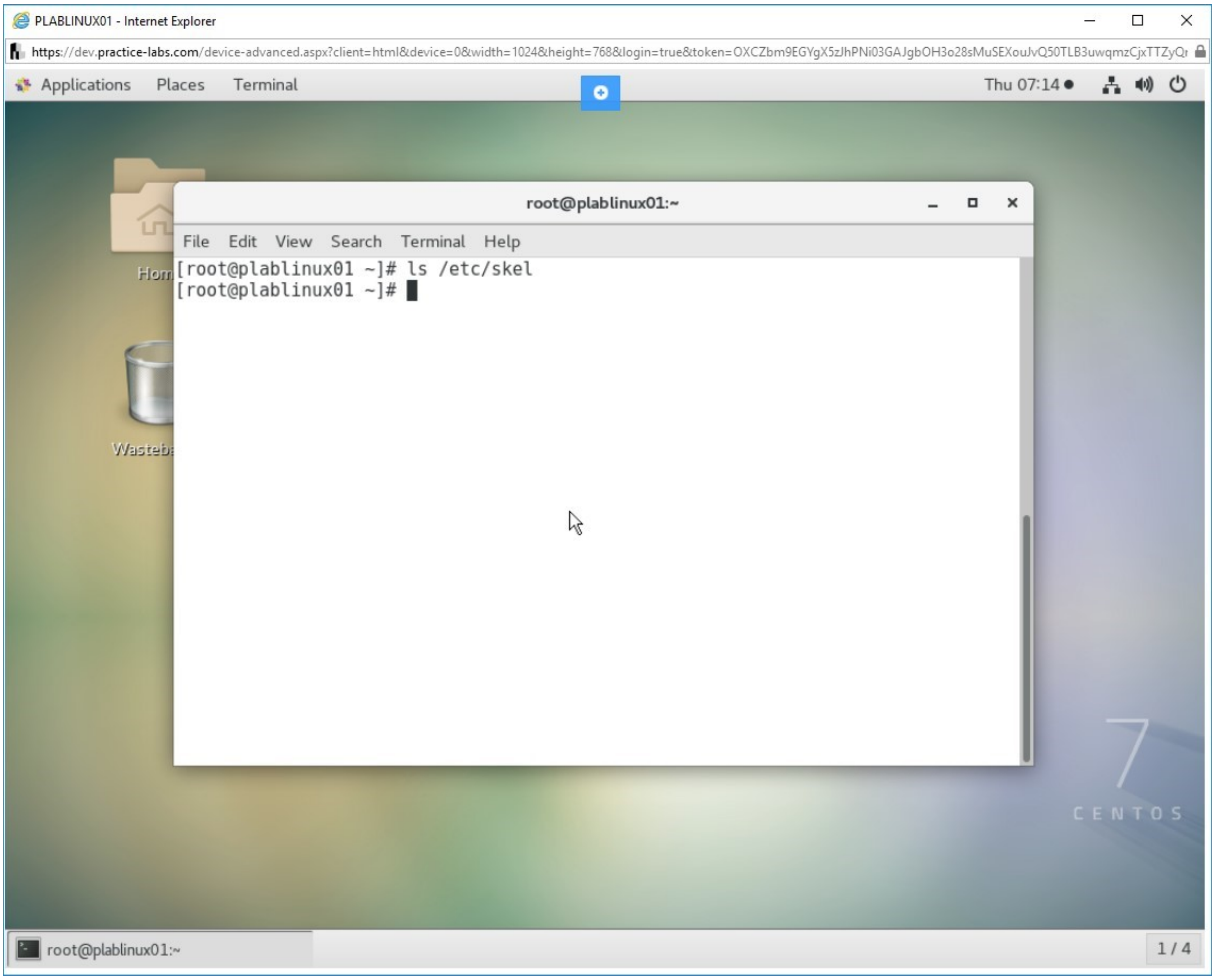
```
clear
```

Let's view the contents of the **/etc/skel** directory. Type the following command:

```
ls /etc/skel
```

Press **Enter**.

Note that the **/etc/skel** directory is empty. The ls -l command does not show the hidden files. You use a different command to view the hidden files.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQ
Applications
Places
Terminal
Thu 07:14 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4
7
CENTOS

```
[root@plablinux01 ~]# ls /etc/skel
[root@plablinux01 ~]# 
```

Figure 1.14 Screenshot of PLABLINUX01: Listing the contents of the /etc/skel directory.

Step 2

To view the hidden files, type the following command:

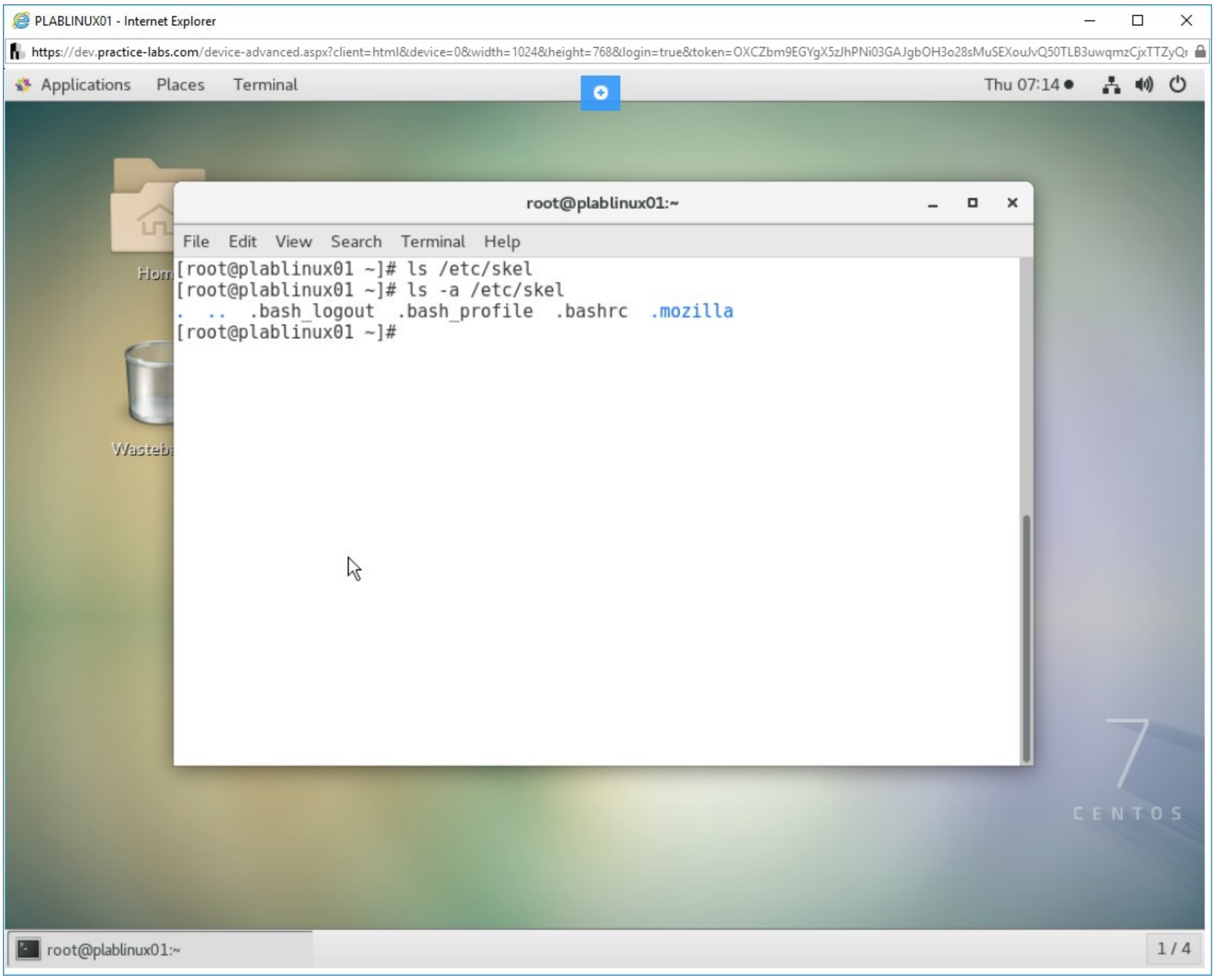
```
ls -a /etc/skel
```

Press **Enter**.

Note that the **skel** directory contains three files:

- /etc/skel/.bash_profile
- /etc/skel/.bashrc
- /etc/skel/.bash_logout

A skel directory normally contains these three files.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:14 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls /etc/skel
[root@plablinux01 ~]# ls -a /etc/skel
.  ..  .bash_logout  .bash_profile  .bashrc  .mozilla
[root@plablinux01 ~]#
```

Figure 1.15 Screenshot of PLABLINUX01: Listing the hidden files of the /etc/skel directory.

Step 3

Clear the screen by entering the following command:

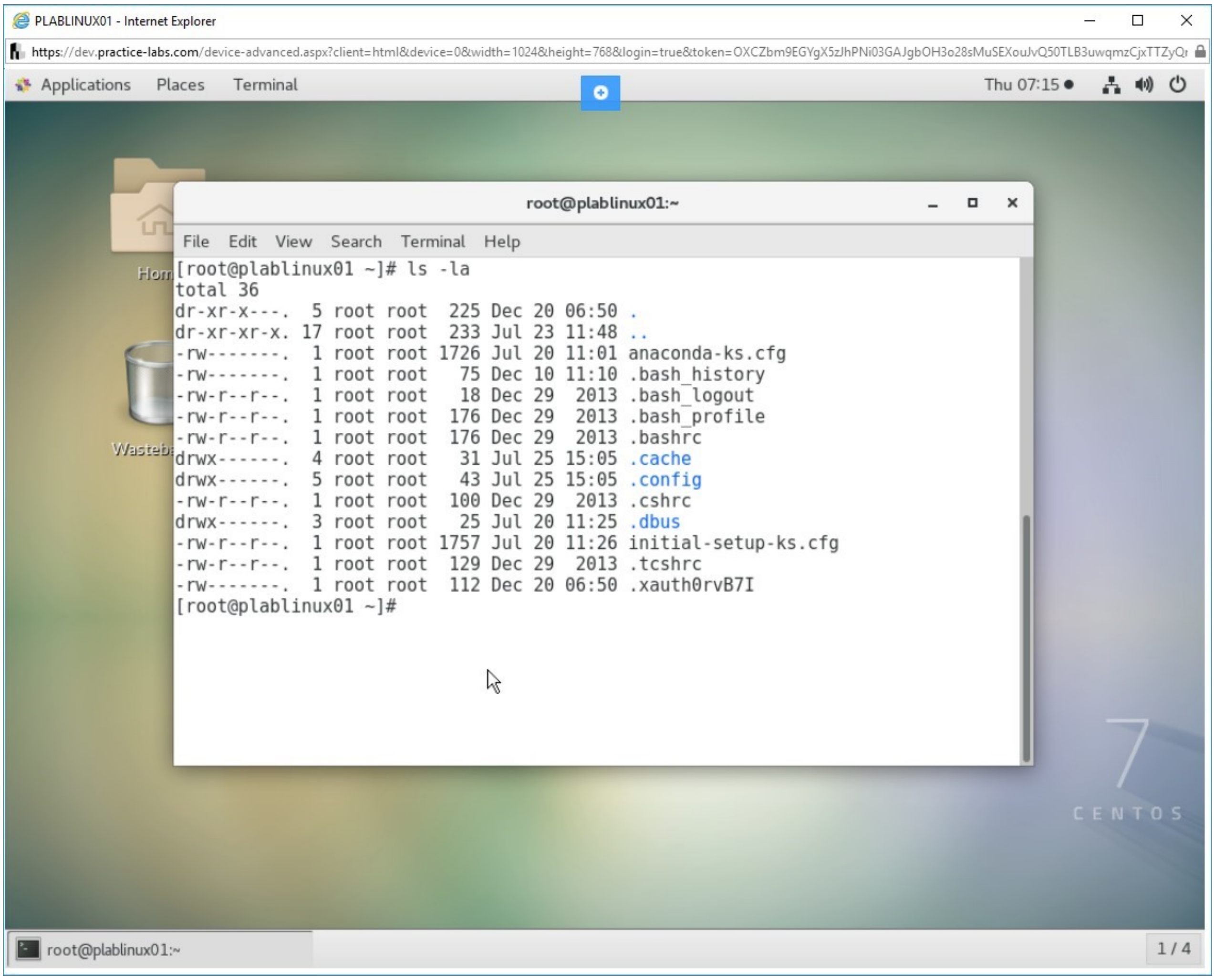
```
clear
```

Let's see what ls -la command does. Type the following command:

```
ls -la
```

Press **Enter**.

The ls -la command lists all the files in the directory.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:15 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -la
total 36
dr-xr-x---.  5 root root  225 Dec 20 06:50 .
dr-xr-xr-x. 17 root root  233 Jul 23 11:48 ..
-rw-------.  1 root root 1726 Jul 20 11:01 anaconda-ks.cfg
-rw-------.  1 root root   75 Dec 10 11:10 .bash_history
-rw-r--r--.  1 root root   18 Dec 29  2013 .bash_logout
-rw-r--r--.  1 root root  176 Dec 29  2013 .bash_profile
-rw-r--r--.  1 root root  176 Dec 29  2013 .bashrc
drwx------.  4 root root   31 Jul 25 15:05 .cache
drwx------.  5 root root   43 Jul 25 15:05 .config
-rw-r--r--.  1 root root  100 Dec 29  2013 .cshrc
drwx------.  3 root root   25 Jul 20 11:25 .dbus
-rw-r--r--.  1 root root 1757 Jul 20 11:26 initial-setup-ks.cfg
-rw-r--r--.  1 root root  129 Dec 29  2013 .tcshrc
-rw-------.  1 root root  112 Dec 20 06:50 .xauth0rvB7I
[root@plablinux01 ~]#
```

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

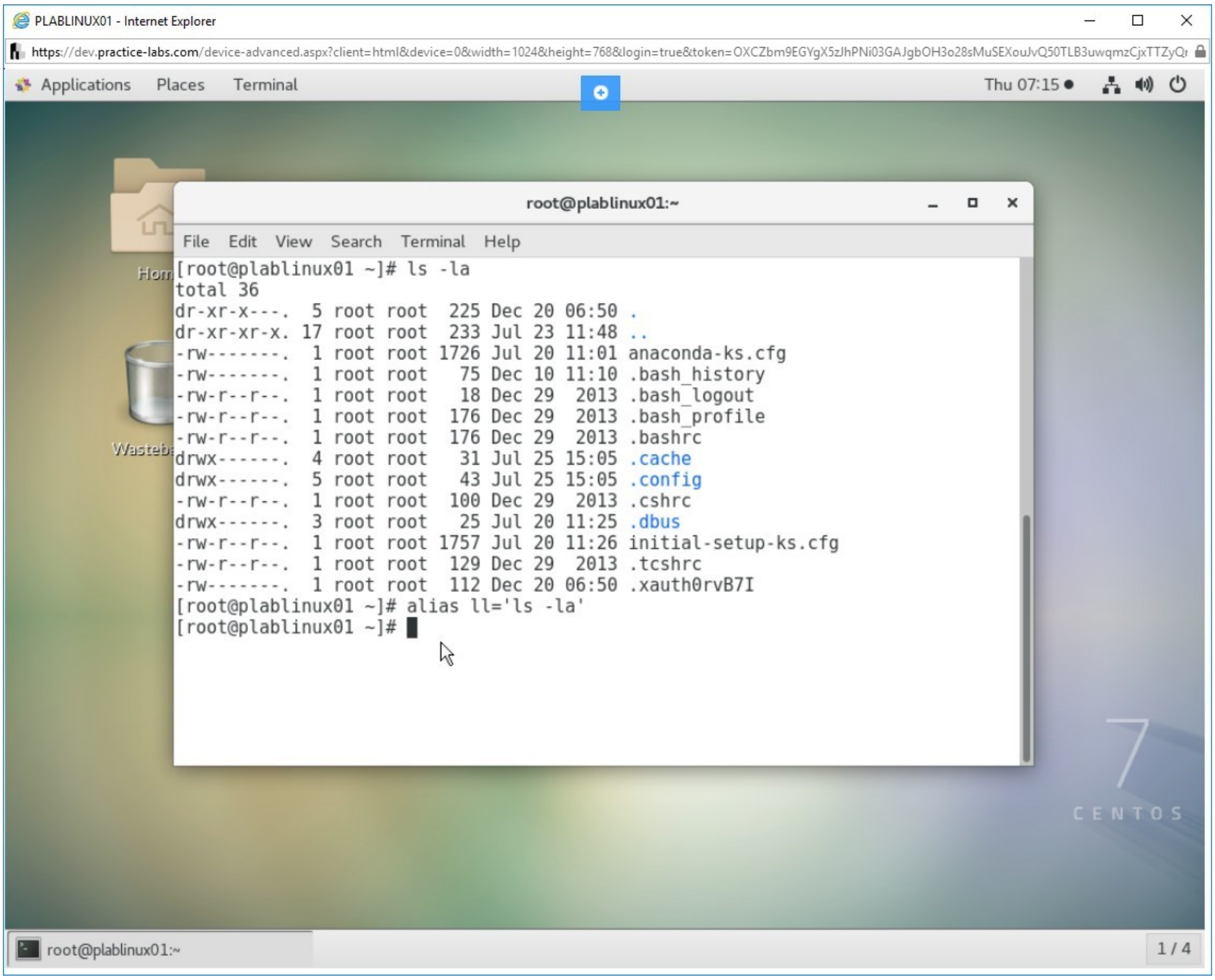
Step 4

You can also use the alias to run a command. For example, if you want to use **ls -la**, you can simply define the alias as **ll**. Every time in a session you run **ll**, you will execute the **ls -la** command.

To define an alias for the **ls -la** command, type the following command:

```
alias ll='ls -la'
```

Press **Enter**.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:15 ●
Home
Wastebasket
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -la
total 36
dr-xr-x---.  5 root root  225 Dec 20 06:50 .
dr-xr-xr-x. 17 root root  233 Jul 23 11:48 ..
-rw-------.  1 root root 1726 Jul 20 11:01 anaconda-ks.cfg
-rw-------.  1 root root   75 Dec 10 11:10 .bash_history
-rw-r--r--.  1 root root   18 Dec 29  2013 .bash_logout
-rw-r--r--.  1 root root  176 Dec 29  2013 .bash_profile
-rw-r--r--.  1 root root  176 Dec 29  2013 .bashrc
drwx------.  4 root root   31 Jul 25 15:05 .cache
drwx------.  5 root root   43 Jul 25 15:05 .config
-rw-r--r--.  1 root root  100 Dec 29  2013 .cshrc
drwx------.  3 root root   25 Jul 20 11:25 .dbus
-rw-r--r--.  1 root root 1757 Jul 20 11:26 initial-setup-ks.cfg
-rw-r--r--.  1 root root  129 Dec 29  2013 .tcshrc
-rw-------.  1 root root  112 Dec 20 06:50 .xauth0rvB7I
[root@plablinux01 ~]# alias ll='ls -la'
[root@plablinux01 ~]# 
```

Figure 1.17 Screenshot of PLABLINUX01: Defining an alias.

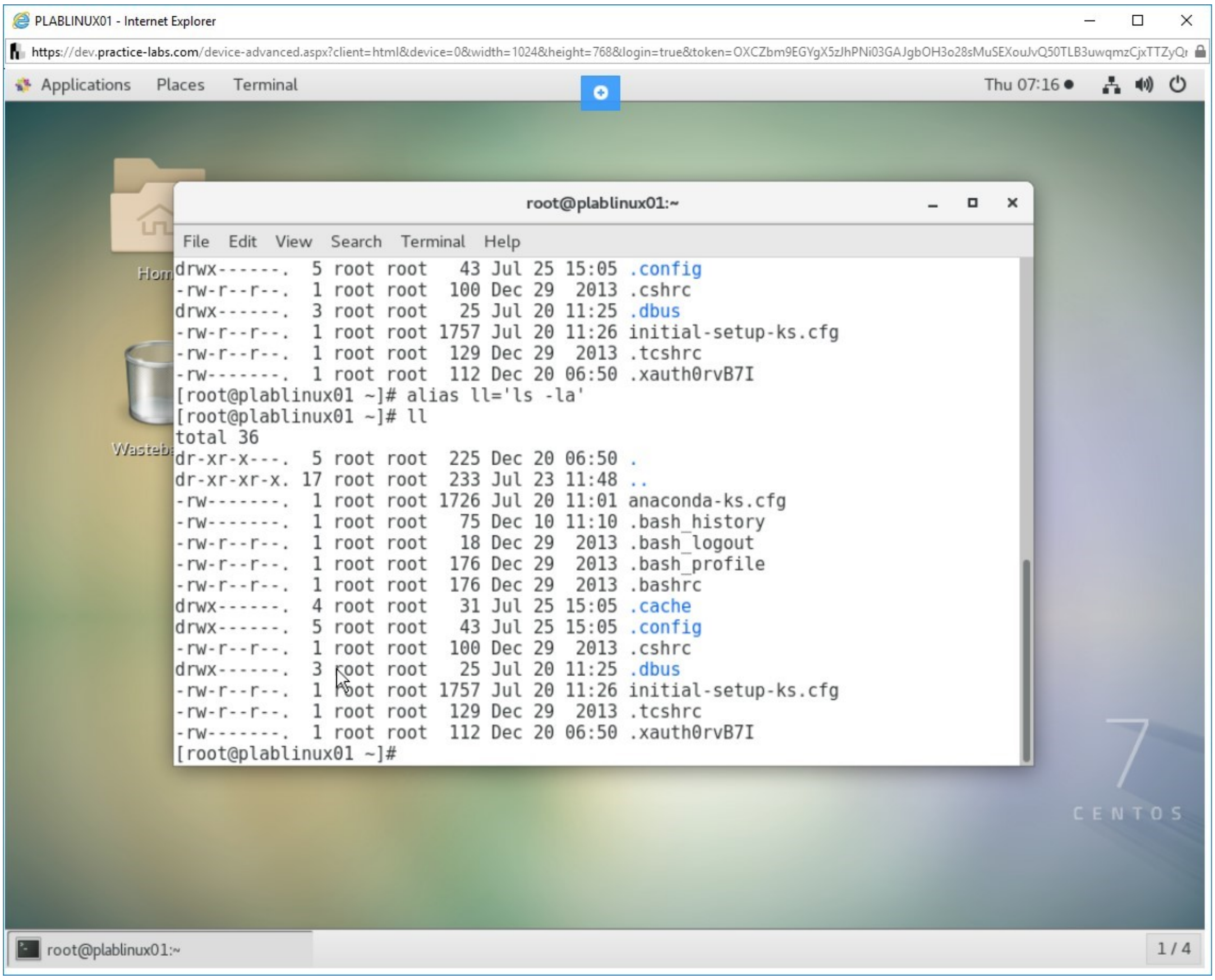
Step 5

To test the alias, type the following command:

```
ll
```

Press **Enter**.

Note that the display is the same as for the **ls -la** command. This indicates that the alias is now enabled.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:16 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
drwx------.  5 root root   43 Jul 25 15:05 .config
-rw-r--r--.  1 root root  100 Dec 29  2013 .cshrc
drwx------.  3 root root   25 Jul 20 11:25 .dbus
-rw-r--r--.  1 root root 1757 Jul 20 11:26 initial-setup-ks.cfg
-rw-r--r--.  1 root root  129 Dec 29  2013 .tcshrc
-rw-------.  1 root root  112 Dec 20 06:50 .xauth0rvB7I
[root@plablinux01 ~]# alias ll='ls -la'
[root@plablinux01 ~]# ll
total 36
dr-xr-x---.  5 root root  225 Dec 20 06:50 .
dr-xr-xr-x. 17 root root  233 Jul 23 11:48 ..
-rw-------.  1 root root 1726 Jul 20 11:01 anaconda-ks.cfg
-rw-------.  1 root root   75 Dec 10 11:10 .bash_history
-rw-r--r--.  1 root root   18 Dec 29  2013 .bash_logout
-rw-r--r--.  1 root root  176 Dec 29  2013 .bash_profile
-rw-r--r--.  1 root root  176 Dec 29  2013 .bashrc
drwx------.  4 root root   31 Jul 25 15:05 .cache
drwx------.  5 root root   43 Jul 25 15:05 .config
-rw-r--r--.  1 root root  100 Dec 29  2013 .cshrc
drwx------.  3 root root   25 Jul 20 11:25 .dbus
-rw-r--r--.  1 root root 1757 Jul 20 11:26 initial-setup-ks.cfg
-rw-r--r--.  1 root root  129 Dec 29  2013 .tcshrc
-rw-------.  1 root root  112 Dec 20 06:50 .xauth0rvB7I
[root@plablinux01 ~]#
```

Figure 1.18 Screenshot of PLABLINUX01: Executing the alias.

Step 6

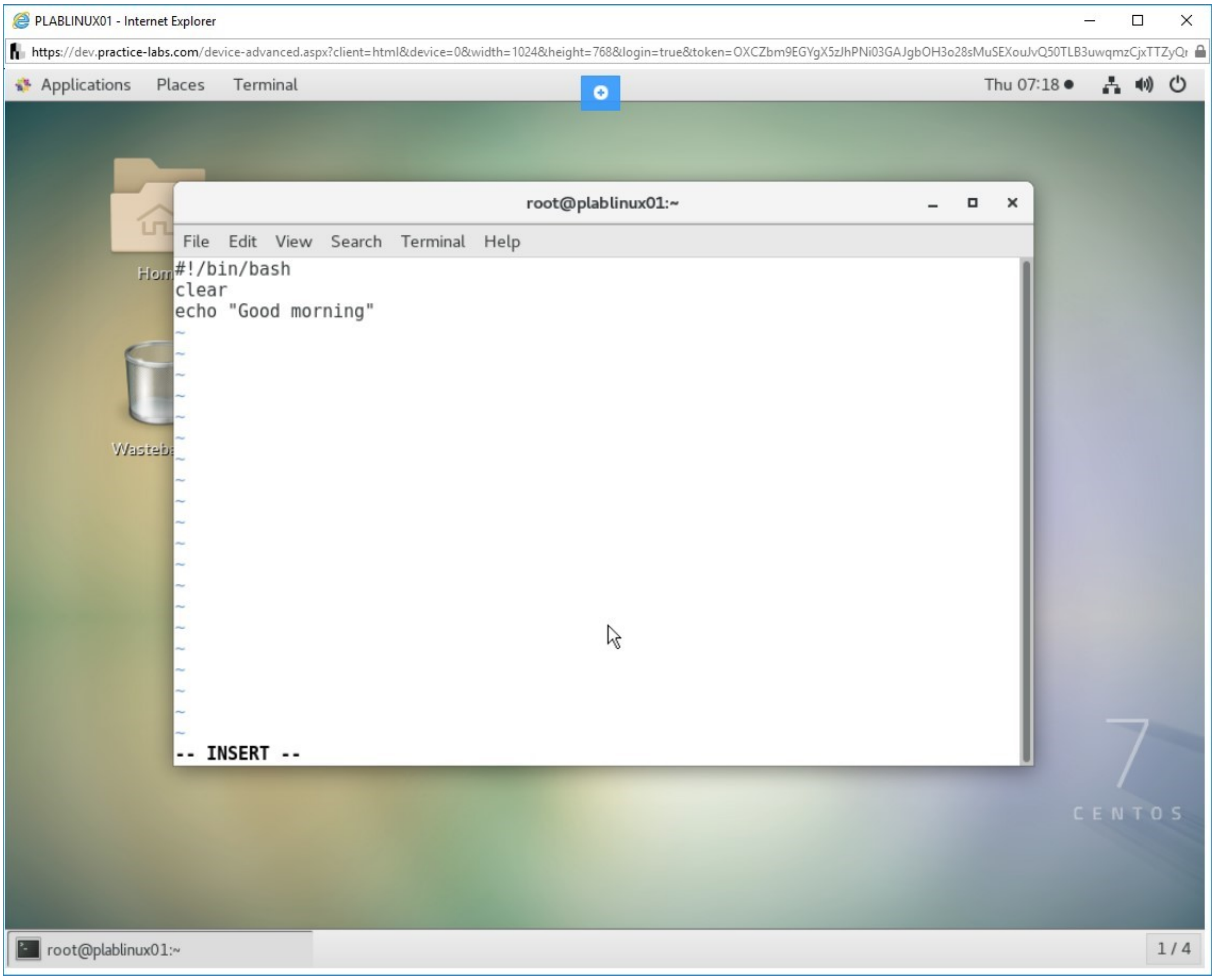
Clear the screen by entering the following command:

```
clear
```

You can use the source command to execute a file in the current context. The current context is the environment in which the file is executed. To look into the use of the source command let us create an executable file. The executable file, which is a script, contains the extension .sh.

Type vi test.sh at the command prompt and then press **Enter**. When the **test.sh** file opens in the vi editor, press i to enter into the edit mode. in this file, type the following lines:

```
#!/bin/bash
clear
echo "Good morning"
```


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:18 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Hom
Wasteb
CENTOS
root@plablinux01:~
1 / 4

```
#!/bin/bash
clear
echo "Good morning"
-- INSERT --
```

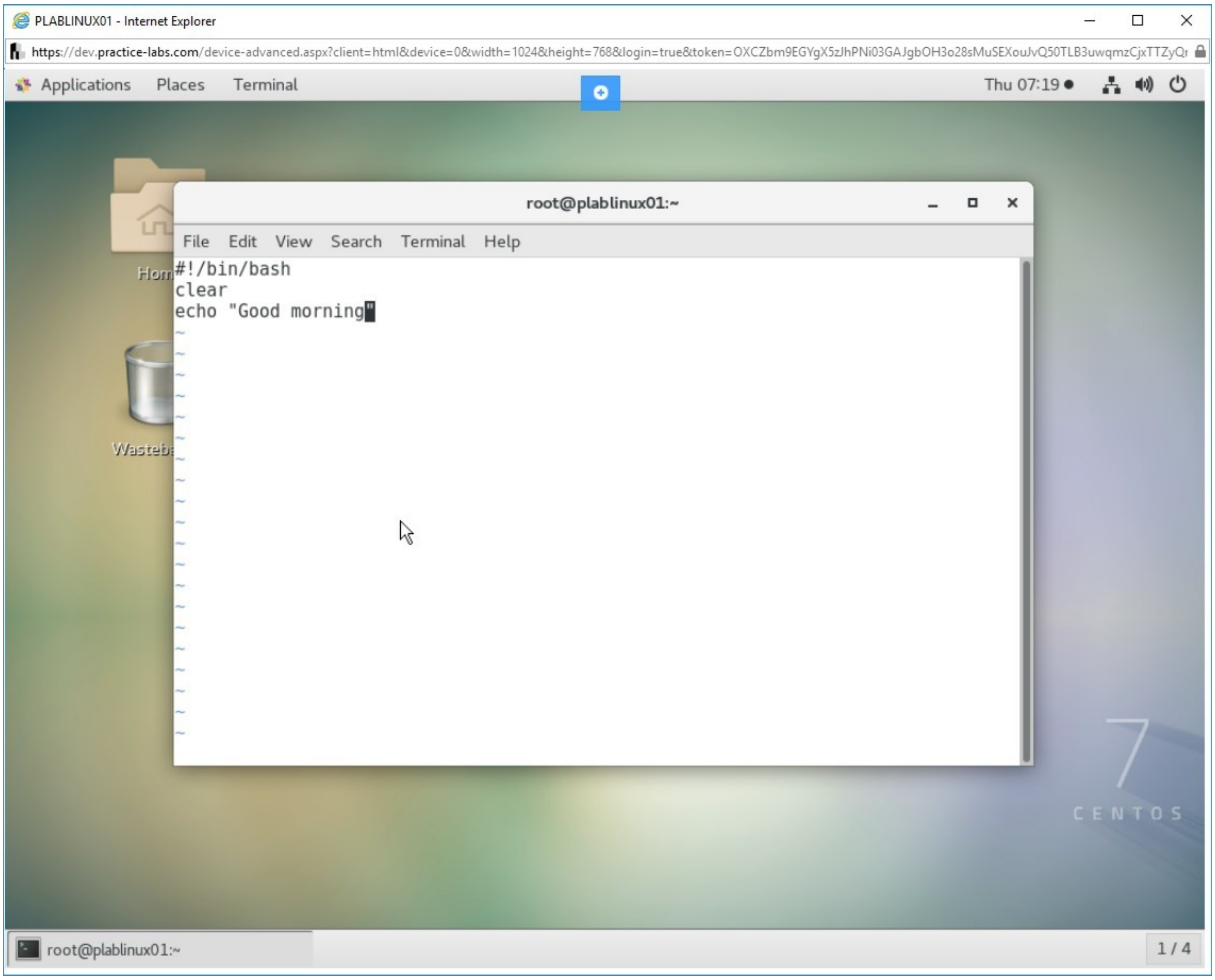
Figure 1.19 Screenshot of PLABLINUX01: Writing a shell script in the vi editor.

Step 7

To save and exit the file, press **ESC** and then type the following command:

```
:wq
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:19 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wasteb
CENTOS
root@plablinux01:~
1 / 4

```
#!/bin/bash
clear
echo "Good morning"
```

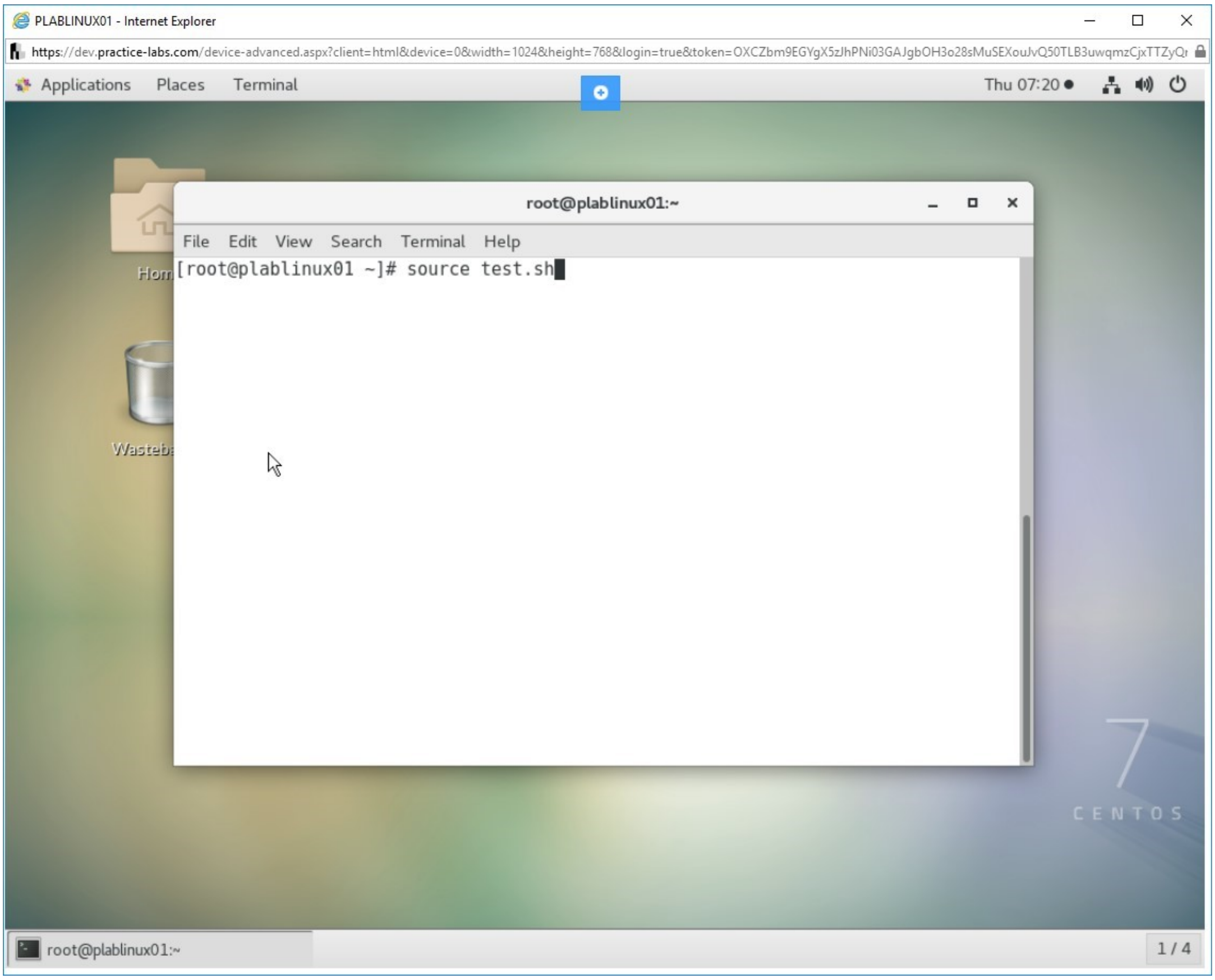
Figure 1.20 Screenshot of PLABLINUX01: Saving and exiting the shell script in the vi editor.

Step 8

You are now back on the command prompt. To run the source command, type the following command:

```
source test.sh
```

Press **Enter**.



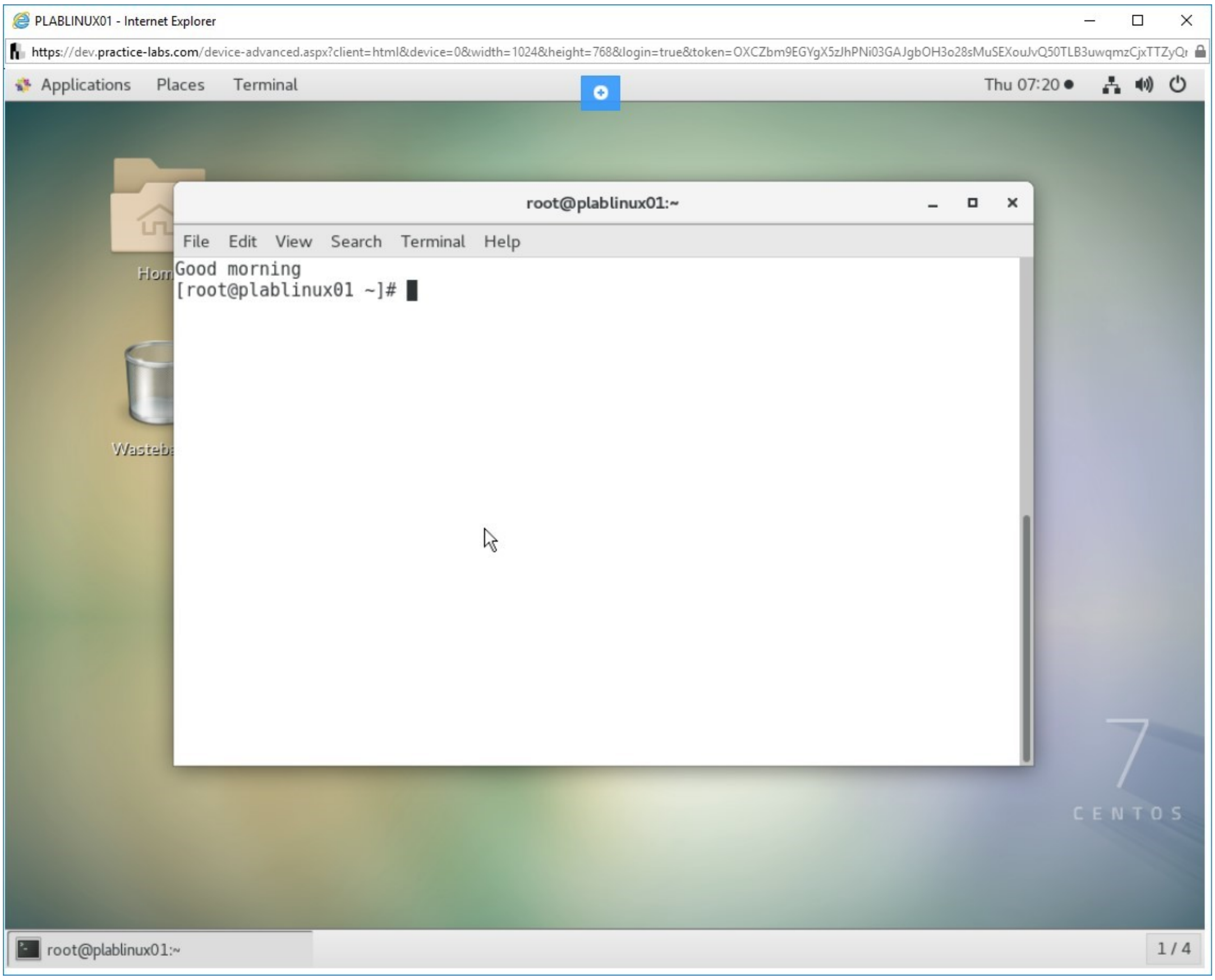
PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQı
Applications
Places
Terminal
Thu 07:20 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Hom
Wasteb
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# source test.sh
```

Figure 1.21 Screenshot of PLABLINUX01: Running the source command.

Step 9

Note the result. **Good Morning** is echoed on the screen. This indicates that the specified source file is executed.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQ
Applications
Places
Terminal
Thu 07:20 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
Good morning
[root@plablinux01 ~]#
```

Figure 1.22 Screenshot of PLABLINUX01: Displaying the echoed result of the shell script on the screen.

Task 5 - Set Command Search Path with Proper Directory

The set command is used to define and determine the values of the local system environment. To set the command search path with the proper directory, perform the following steps:

Step 1

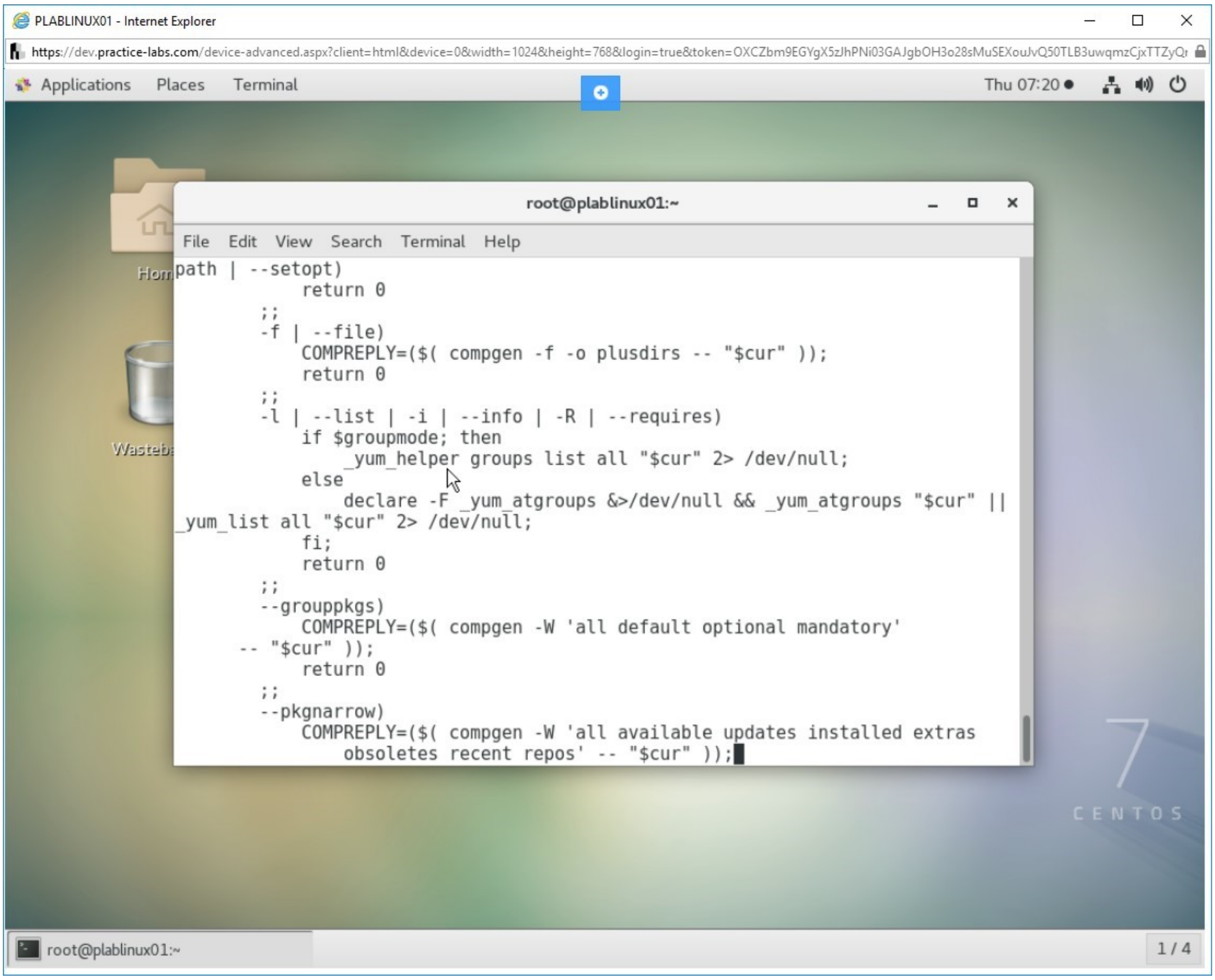
Clear the screen by entering the following command:

```
clear
```

You can use the set command to view the functions and variables currently being used by the shell. Type the following command:

```
set
```

Press **Enter**.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:20 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
path | --setopt)
            return 0
        ;;
        -f | --file)
            COMPREPLY=($( compgen -f -o plusdirs -- "$cur" ));
            return 0
        ;;
        -l | --list | -i | --info | -R | --requires)
            if $groupmode; then
                _yum_helper groups list all "$cur" 2> /dev/null;
            else
                declare -F _yum_atgroups &>/dev/null && _yum_atgroups "$cur" ||
_yum_list all "$cur" 2> /dev/null;
            fi;
            return 0
        ;;
        --grouppkgs)
            COMPREPLY=($( compgen -W 'all default optional mandatory'
      -- "$cur" ));
            return 0
        ;;
        --pkgnarrow)
            COMPREPLY=($( compgen -W 'all available updates installed extras
                obsoletes recent repos' -- "$cur" ));
```

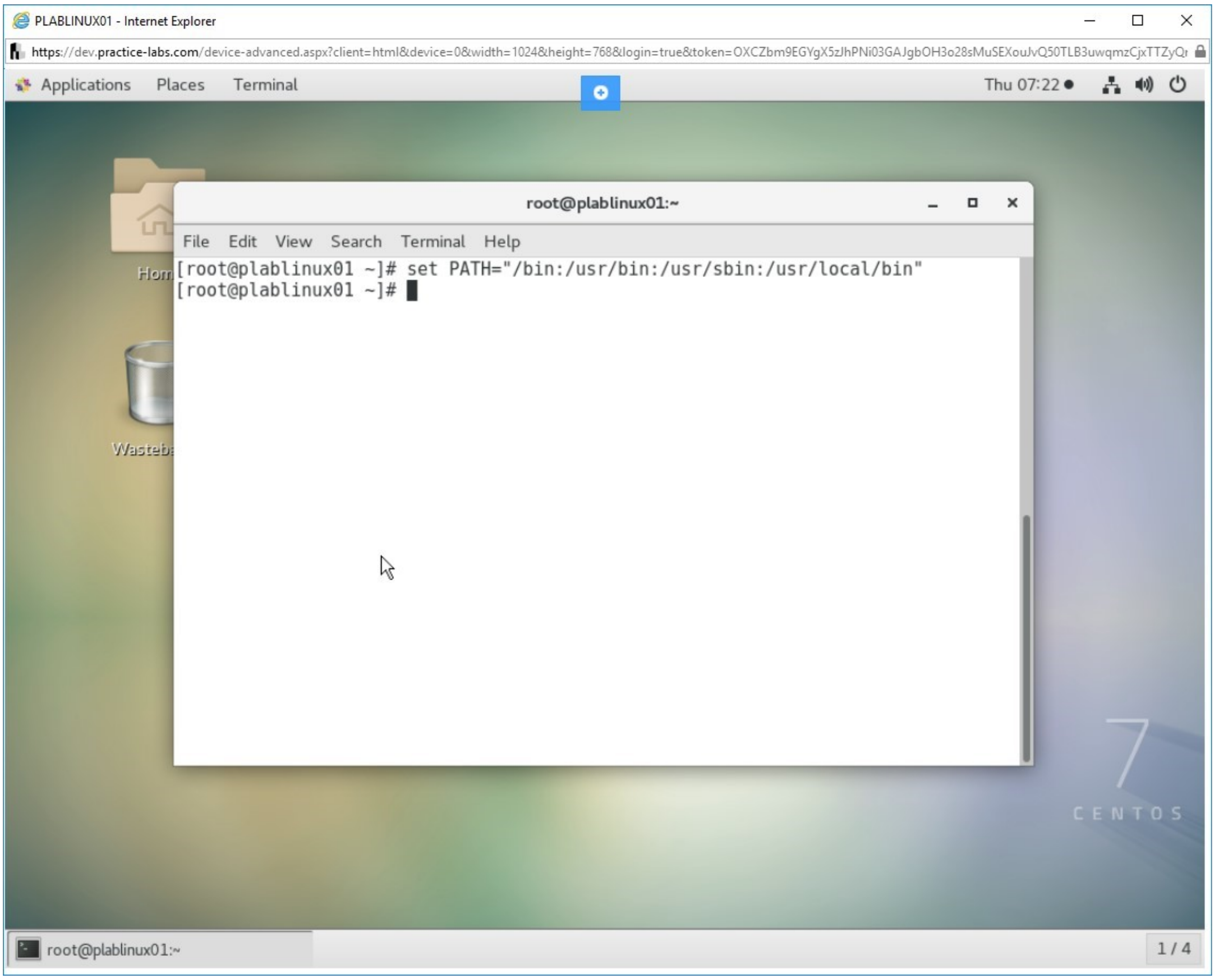
Figure 1.23 Screenshot of PLABLINUX01: Viewing the functions and variables currently being used by the shell.

Step 2

You can also set the path using the set command. Type the following command:

```
set PATH="/bin:/usr/bin:/usr/sbin:/usr/local/bin"
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:22 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# set PATH="/bin:/usr/bin:/usr/sbin:/usr/local/bin"
[root@plablinux01 ~]# 
```

Figure 1.24 Screenshot of PLABLINUX01: Setting the path using the set command.

Step 3

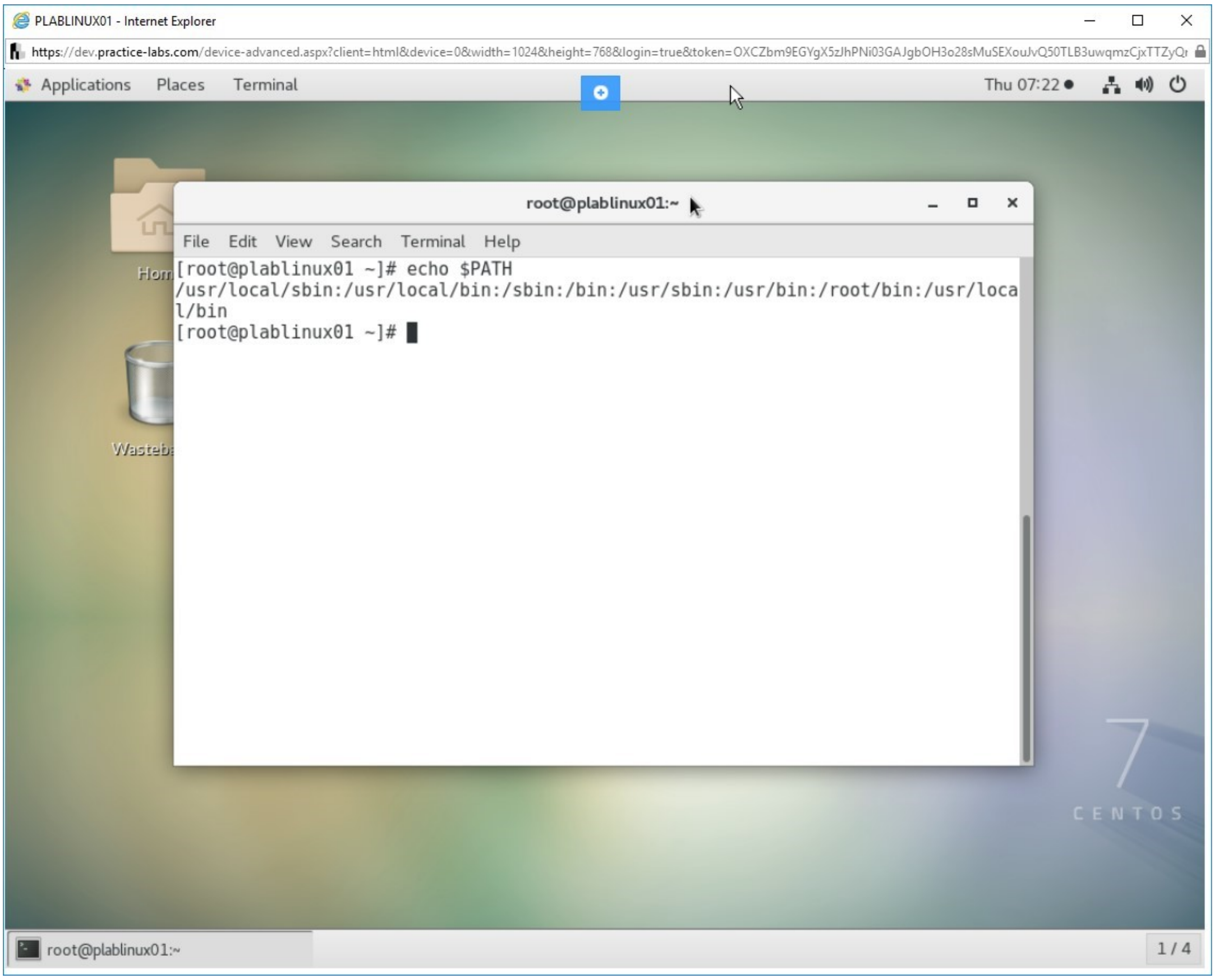
Clear the screen by entering the following command:

```
clear
```

You can display the path using the following command:

```
echo $PATH
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQ
Applications
Places
Terminal
Thu 07:22 ●
Home
Wasteb
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# echo $PATH
/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin:/usr/loca
l/bin
[root@plablinux01 ~]# 
```

Figure 1.25 Screenshot of PLABLINUX01: Displaying the path.

Step 4

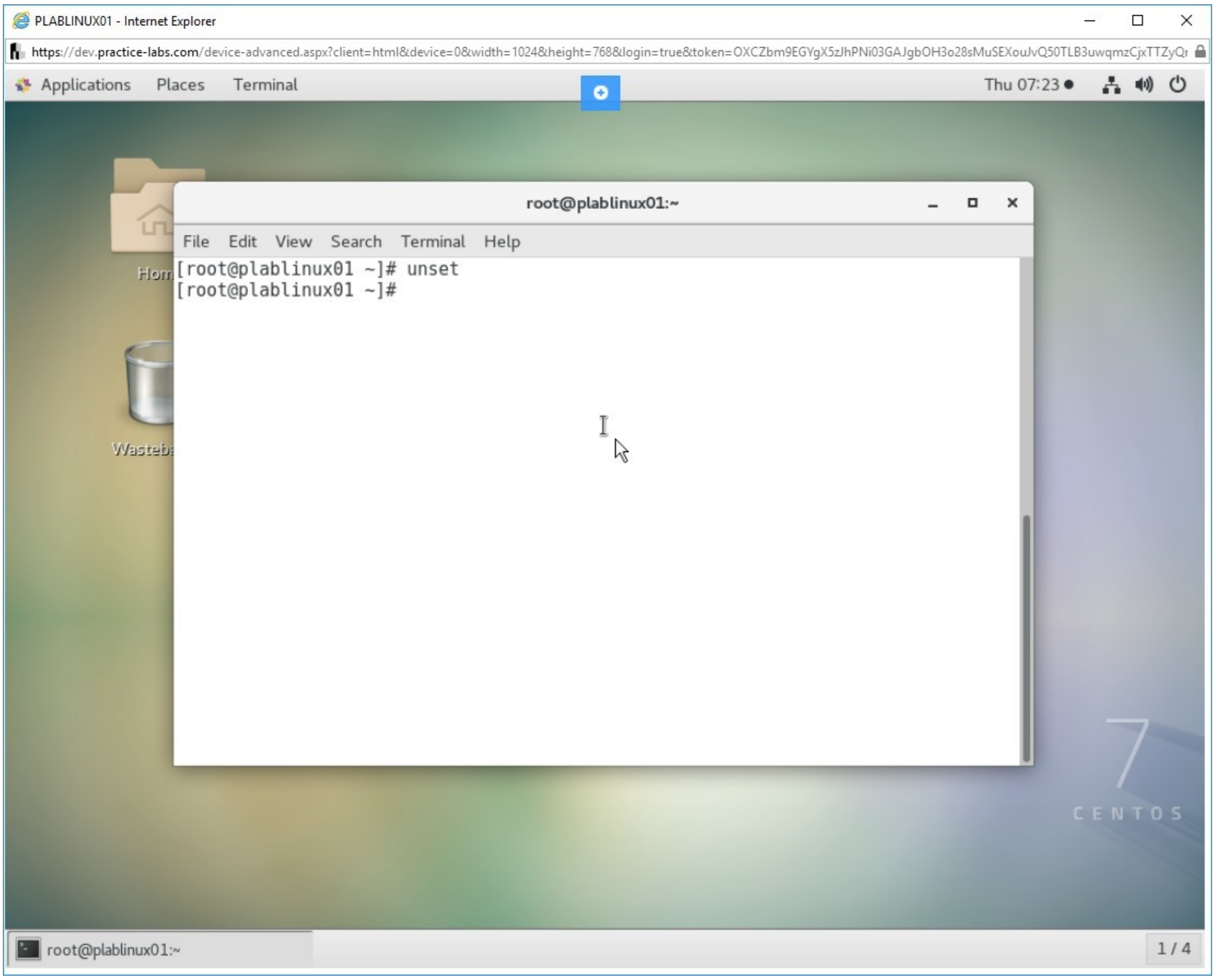
Clear the screen by entering the following command:

```
clear
```

The unset command deletes the variables. Type the following command:

```
unset
```

Press **Enter**.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 07:23 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# unset
[root@plablinux01 ~]#
```

Figure 1.26 Screenshot of PLABLINUX01: Deleting the variables using the unset command.

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

Exercise 2 - SQL Data Management

SQL is the most common language to access and manage a relational database. You can use various SQL commands to perform basic tasks on a database. In this exercise, you will understand how to perform SQL data management.

Please refer to your course material or use your favourite search engine to research for more information about this topic.

Learning Outcomes

After completing this exercise, you will be able to:

- Install MySQL

Your Devices

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

- **PLABLINUX01** (CentOS Server)

PLABLINUX01
CentOS Server
192.168.0.2

Task 1 - Install SQL

Before you start using the SQL statements to perform data management, you need to install MySQL on the local system. There are many alternatives to MySQL, but for this task, you will use MySQL. In this task, you will install MySQL on the Fedora Linux system.

To install SQL, perform the following steps:

Step 1

Connect to **PLABLINUX01**.

Step 2

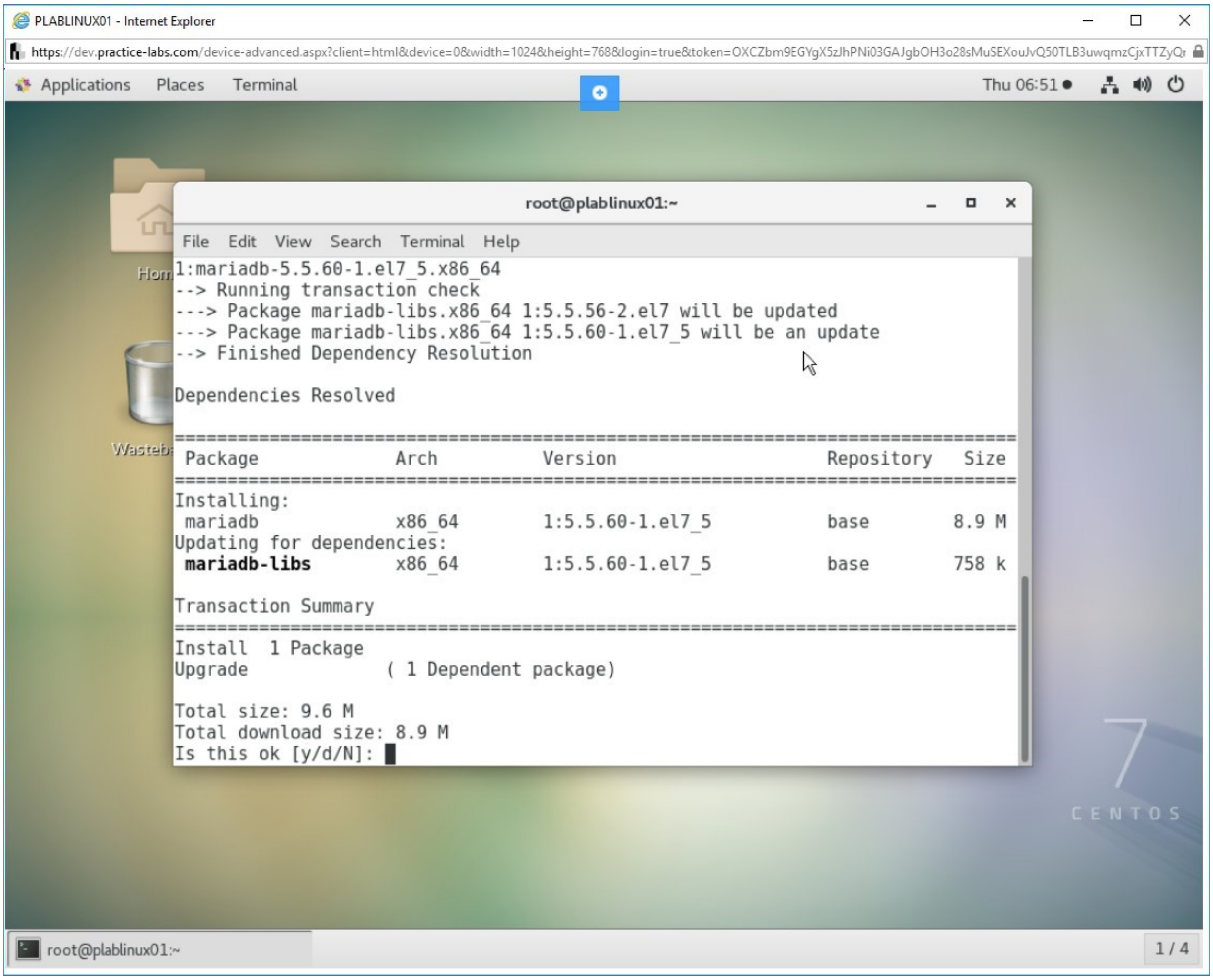
Clear the screen by entering the following command:

```
clear
```

To install MySQL, type the following command:

```
yum install mysql
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 06:51 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
CENTOS
root@plablinux01:~
1 / 4

```
1:mariadb-5.5.60-1.el7_5.x86_64
--> Running transaction check
---> Package mariadb-libs.x86_64 1:5.5.56-2.el7 will be updated
---> Package mariadb-libs.x86_64 1:5.5.60-1.el7_5 will be an update
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
 Package              Arch           Version                    Repository   Size
================================================================================
Installing:
 mariadb              x86_64         1:5.5.60-1.el7_5           base        8.9 M
Updating for dependencies:
 mariadb-libs         x86_64         1:5.5.60-1.el7_5           base        758 k

Transaction Summary
================================================================================
Install  1 Package
Upgrade           ( 1 Dependent package)

Total size: 9.6 M
Total download size: 8.9 M
Is this ok [y/d/N]:
```

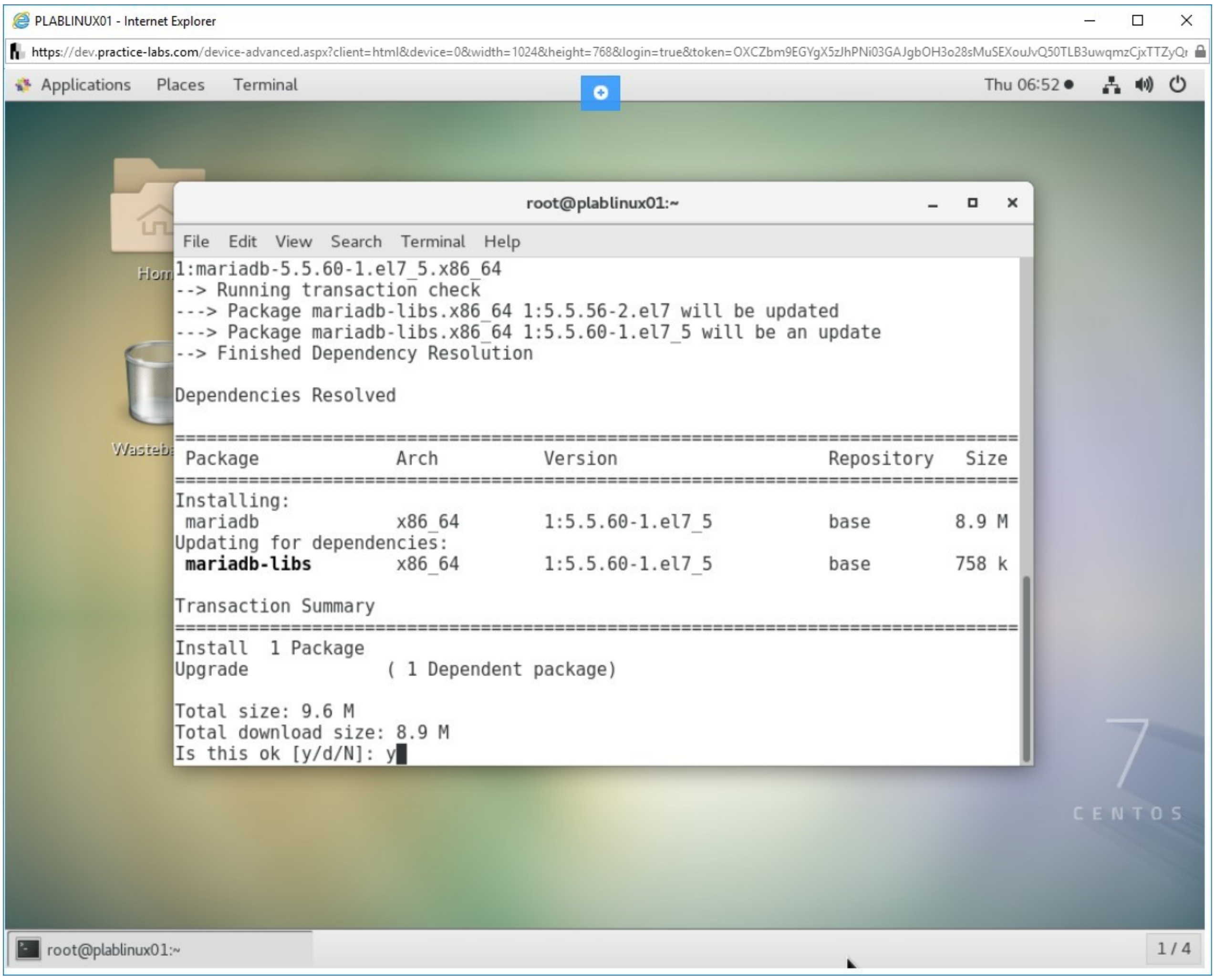
Figure 2.1 Screenshot of PLABLINUX01: Executing a command to install MySQL.

Step 3

When prompted for confirmation, type the following to confirm the installation:

```
y
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 06:52 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

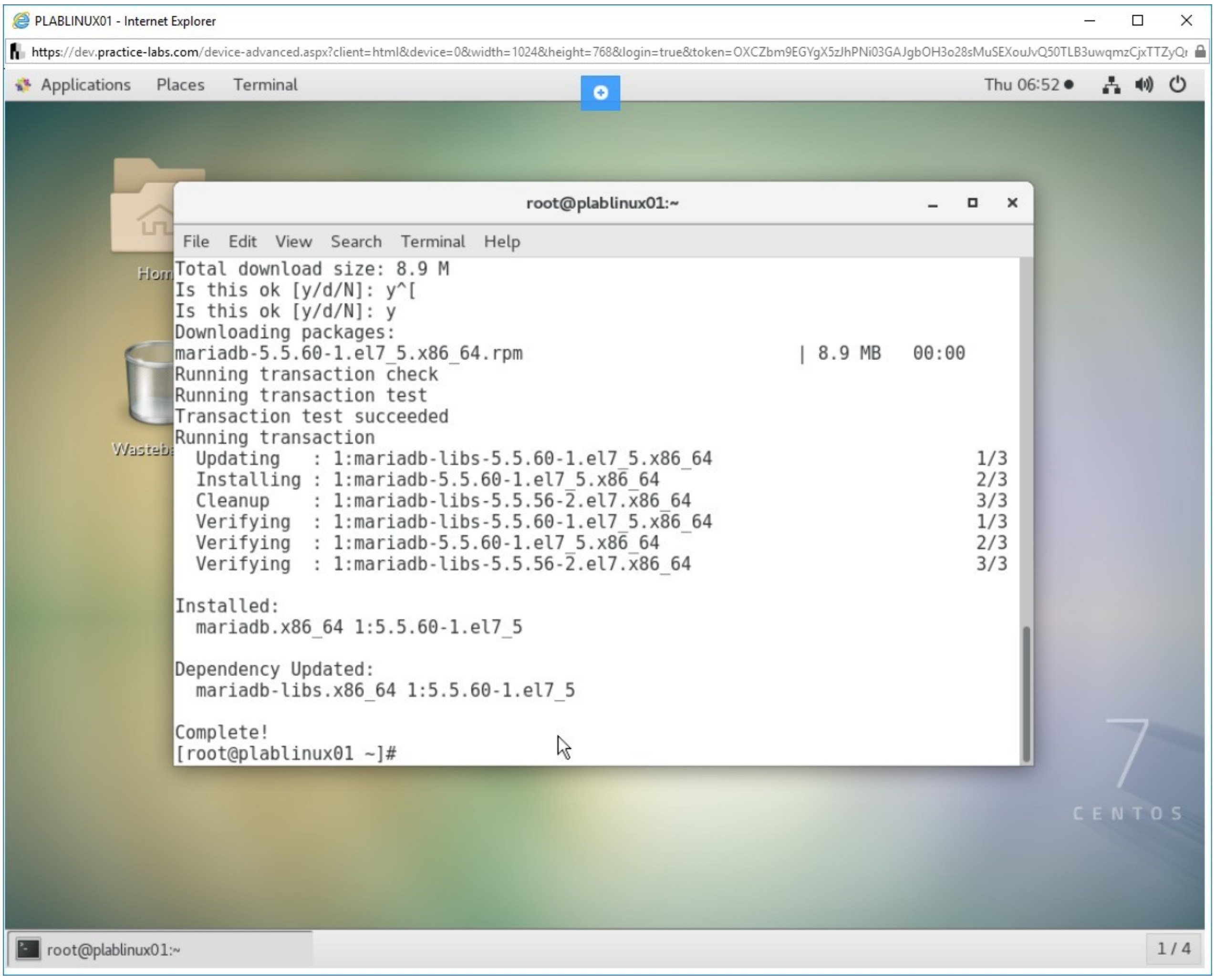
```
1:mariadb-5.5.60-1.el7_5.x86_64
--> Running transaction check
---> Package mariadb-libs.x86_64 1:5.5.56-2.el7 will be updated
---> Package mariadb-libs.x86_64 1:5.5.60-1.el7_5 will be an update
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
 Package             Arch          Version                Repository      Size
================================================================================
Installing:
 mariadb             x86_64        1:5.5.60-1.el7_5       base           8.9 M
Updating for dependencies:
 mariadb-libs        x86_64        1:5.5.60-1.el7_5       base           758 k

Transaction Summary
================================================================================
Install  1 Package
Upgrade             ( 1 Dependent package)

Total size: 9.6 M
Total download size: 8.9 M
Is this ok [y/d/N]: y
```

Figure 2.2 Screenshot of PLABLINUX01: Confirming the download.

Step 4

The installation starts.

After the installation is completed, the **Complete** message is displayed.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=OXCZbm9EGYgX5zJhPNi03GAJgbOH3o28sMuSEXouJvQ50TLB3uwqmzCjxTTZyQr
Applications
Places
Terminal
Thu 06:52 ●
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
Total download size: 8.9 M
Is this ok [y/d/N]: y^[
Is this ok [y/d/N]: y
Downloading packages:
mariadb-5.5.60-1.el7_5.x86_64.rpm                          | 8.9 MB   00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Updating   : 1:mariadb-libs-5.5.60-1.el7_5.x86_64                         1/3
  Installing : 1:mariadb-5.5.60-1.el7_5.x86_64                              2/3
  Cleanup    : 1:mariadb-libs-5.5.56-2.el7.x86_64                           3/3
  Verifying  : 1:mariadb-libs-5.5.60-1.el7_5.x86_64                         1/3
  Verifying  : 1:mariadb-5.5.60-1.el7_5.x86_64                              2/3
  Verifying  : 1:mariadb-libs-5.5.56-2.el7.x86_64                           3/3

Installed:
  mariadb.x86_64 1:5.5.60-1.el7_5

Dependency Updated:
  mariadb-libs.x86_64 1:5.5.60-1.el7_5

Complete!
[root@plablinux01 ~]#
```

Figure 2.3 Screenshot of PLABLINUX01: Displaying the installation completion message.

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

Review

Well done, you have completed the **Shells, Scripting and Data Management** Practice Lab.

Summary

You completed the following exercises:

- Exercise 1 - Customize and Use the Shell Environment
- Exercise 2 - SQL Data Management

You should now be able to:

- List the profile scripts
- Set environment variables
- Write Bash functions
- Maintain skeleton directories for new user accounts
- Set the command search path with the proper directory
- Install MySQL

Feedback

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