

Design Hard Disk Layout

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Introduction

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

Hard Disk

Design Layout

Linux

Architecture

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Design Hard Disk Layout

After completing this lab, you will be able to:

- Ensure the /boot partition conforms to the hardware architecture

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI: 102.2** Install a boot manager
- **LPI: 102.1** Design hard disk layout
- **LPI: 1.4** Given a scenario, manage storage in a Linux environment
- **CompTIA: 1.1** Explain Linux boot process concepts

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 - Design Hard Disk Layout

Partitioning a hard disk helps speed-up file-checks, design enhanced data-security, and configure a wider range of file accessibility modes.

In this exercise, you will understand how Linux lays out the directory structure on the hard disk.

Learning Outcomes

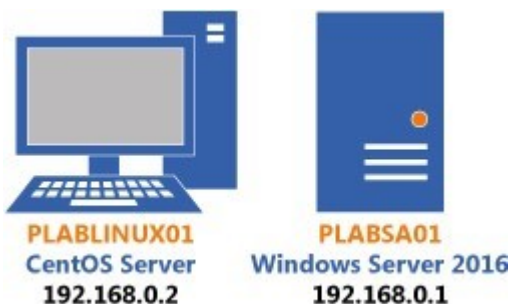
After completing this exercise, you will be able to:

- Log into a Linux System
- Ensure the /boot partition conforms to the hardware architecture

Your Devices

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

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



Task 1 - Ensure the /boot partition conforms to the hardware architecture

To perform any operations on the system, you need to log into the system. In this task, you will log into a CentOS Linux system on the lab.

To log into a Linux system, perform the following steps:

Step 1

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

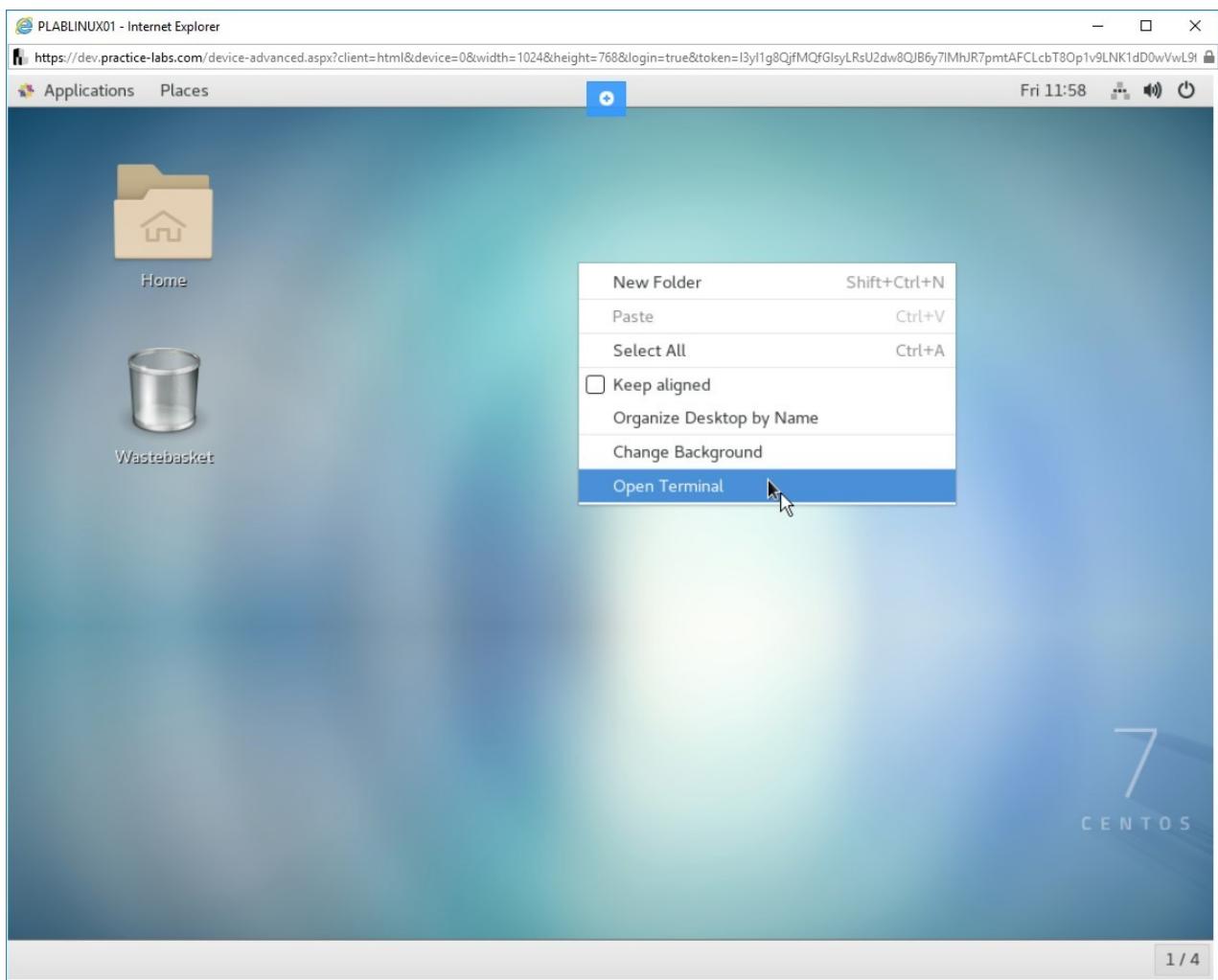


Figure 1.1 Screenshot of PLABLINUX01: Selecting the Open Terminal option from the context menu.

Step 2

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

```
SU -
```

Press **Enter**.

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

```
Passw0rd
```

Press **Enter**.

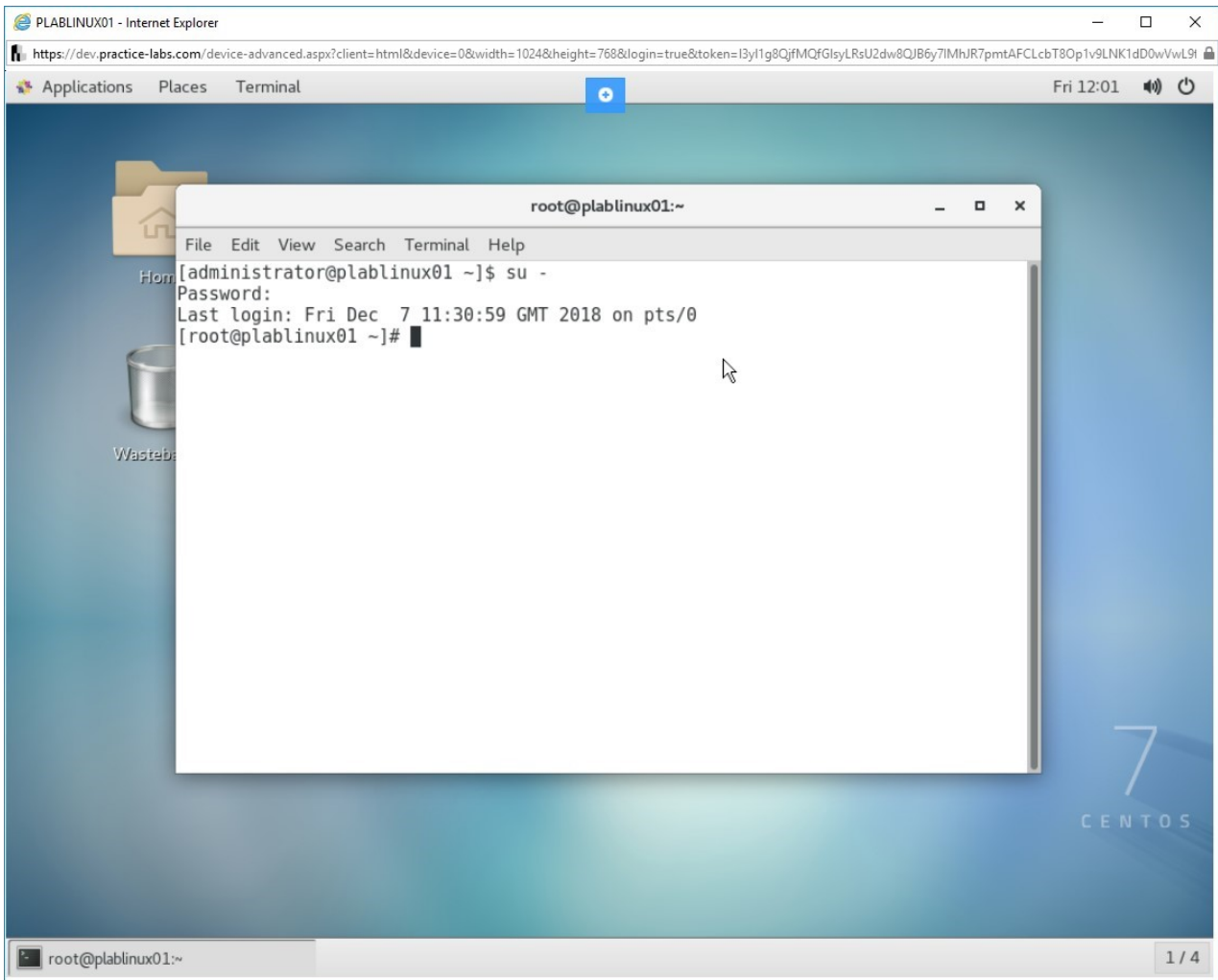


Figure 1.2 Screenshot of PLABLINUX01: Changing the account to the root account with the su command.

Step 3

Clear the screen by entering the following command:

```
clear
```

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

Go to the root directory by entering the following command:

```
cd ..
```

Note that this command will change the directory.

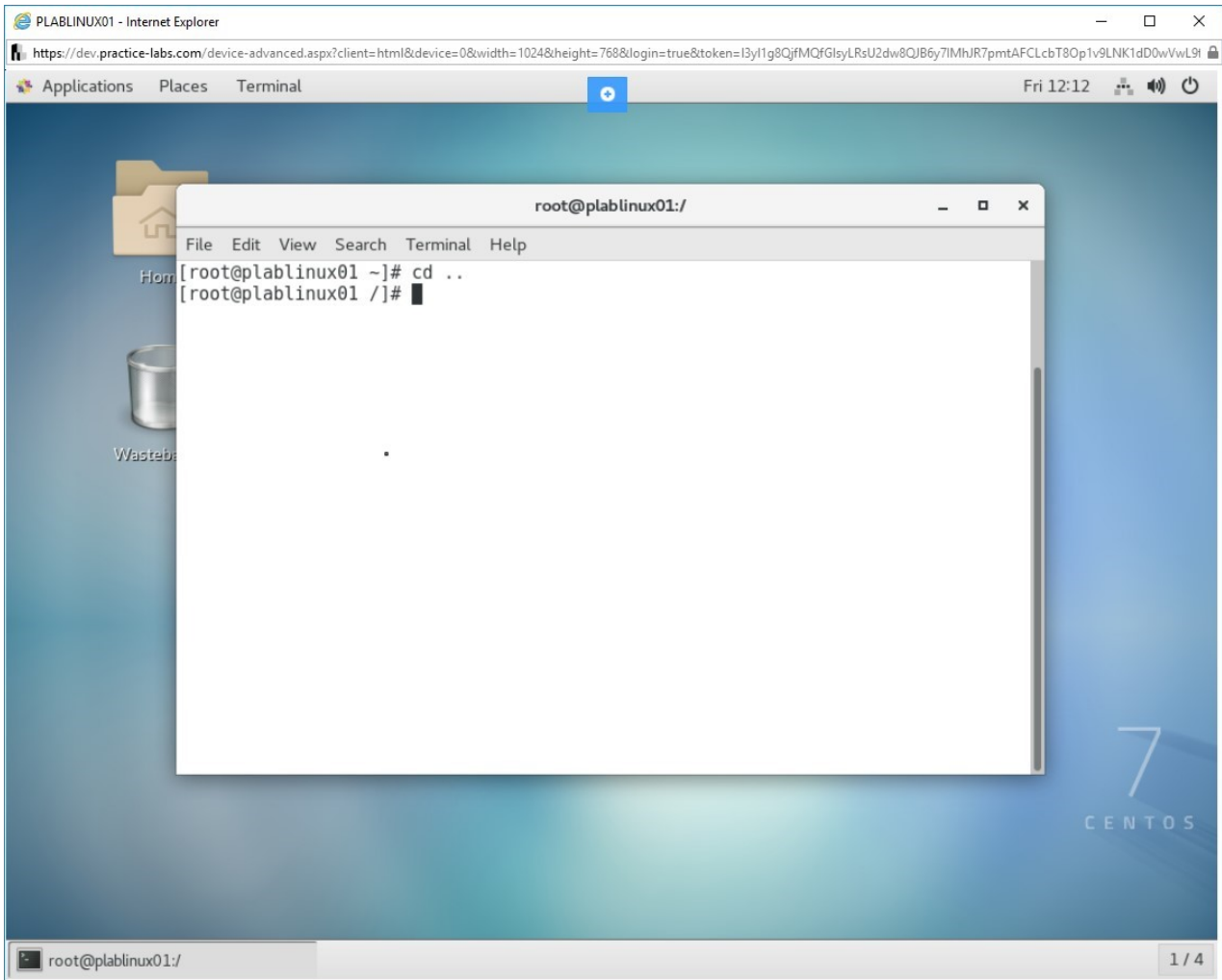


Figure 1.3 Screenshot of PLABLINUX01: Changing the directory using the cd command.

Step 4

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

```
ls -l
```

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

- boot

- usr
- var
- tmp
- home

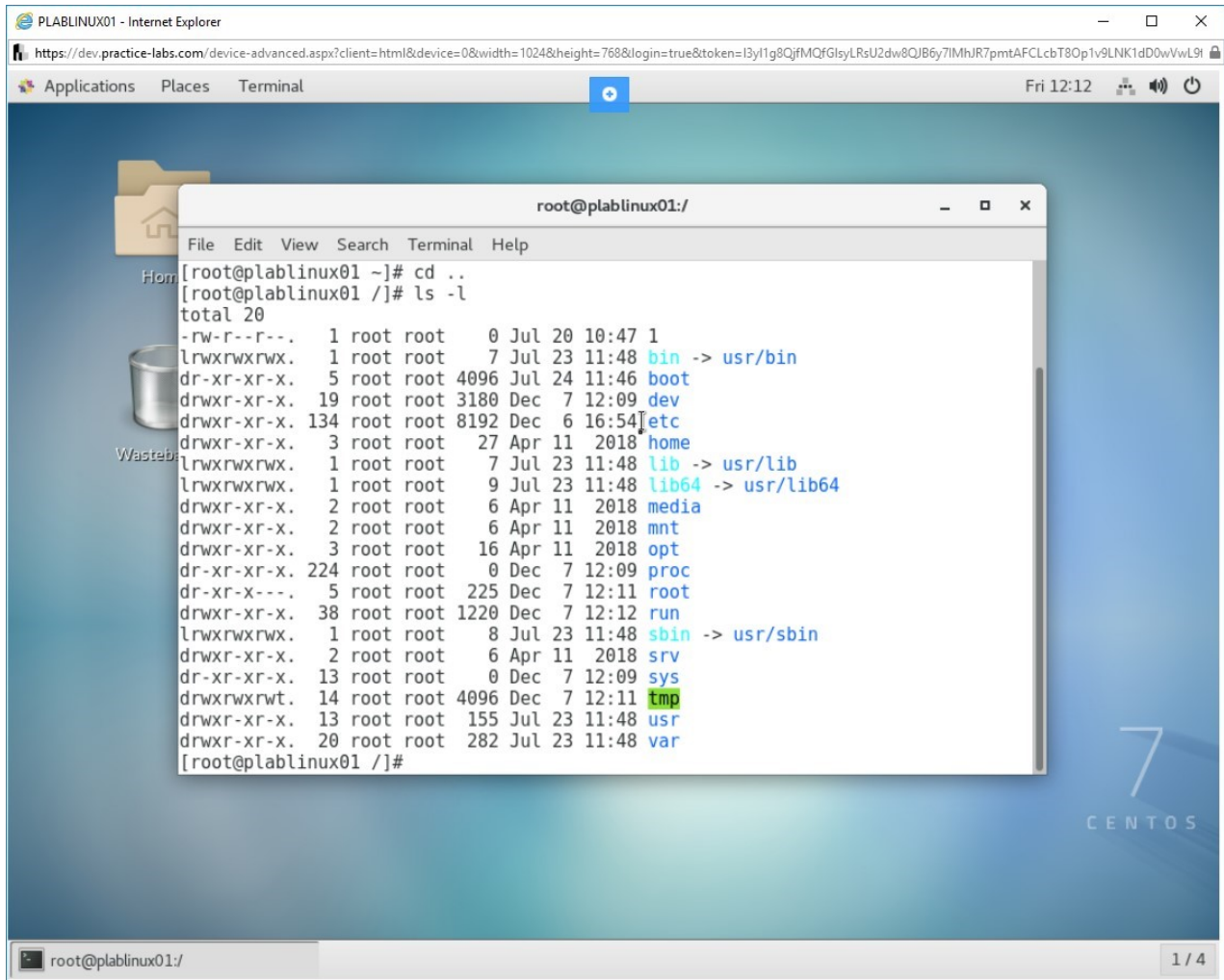


Figure 1.4 Screenshot of PLABLINUX01: Using the `ls -l` command to display the root directory structure.

Step 5

Clear the screen by entering the following command:

```
clear
```

You can also find the total space taken by each of the directories. To find out this detail, type the following command:


```
du -h --max-depth=1
```

Press **Enter**.

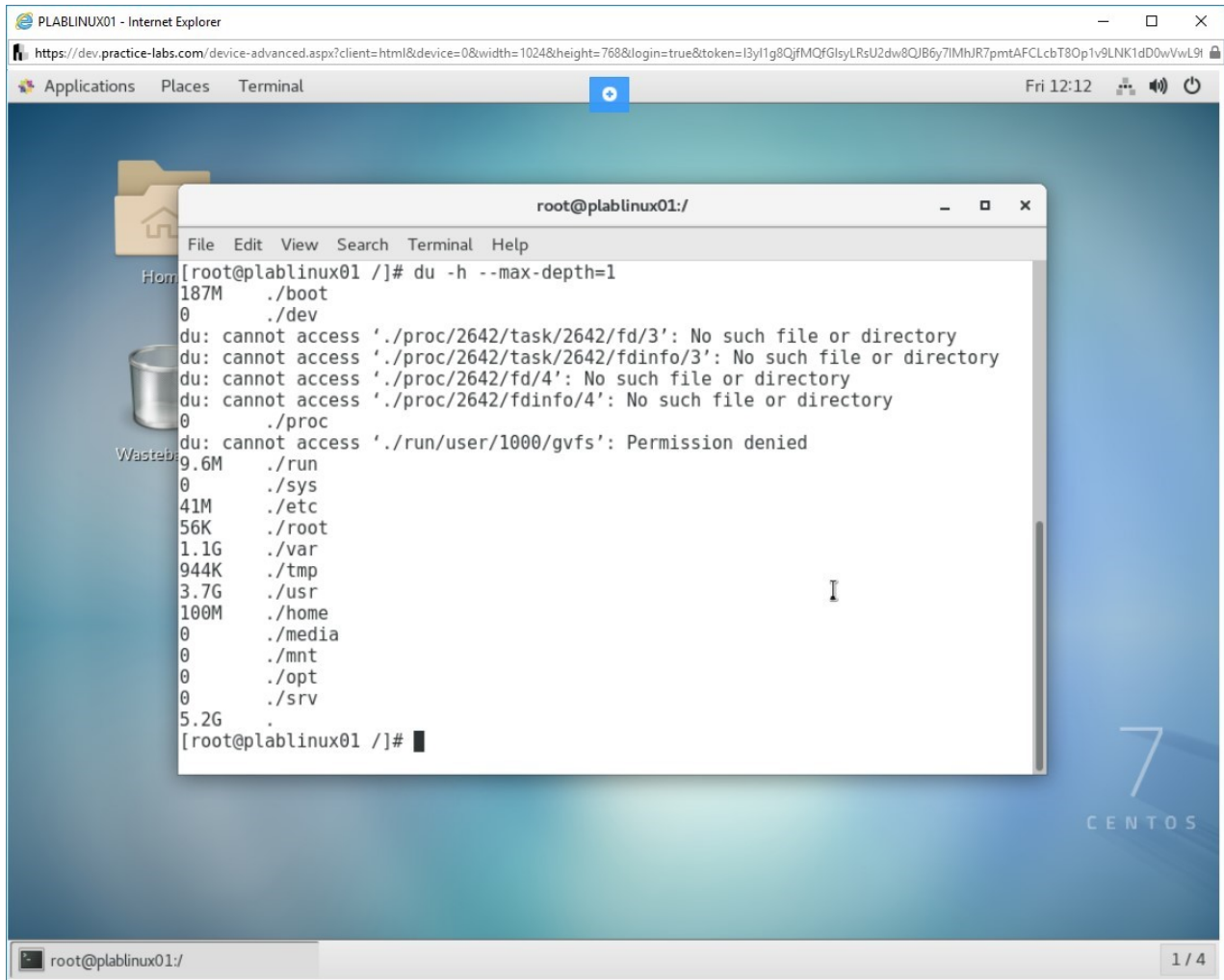


Figure 1.5 Screenshot of PLABLINUX01: Finding the total space taken by each of the directories with the du command.

Step 6

Clear the screen by entering the following command:

```
clear
```

You can also find the space used up individually by each sub-directory as well as the total space used up by the main directory.

For example, to find out the space taken up individually by the sub-directories and the total space taken up by the **/usr** directory, enter the following command:

```
du -h --max-depth=1 /usr
```

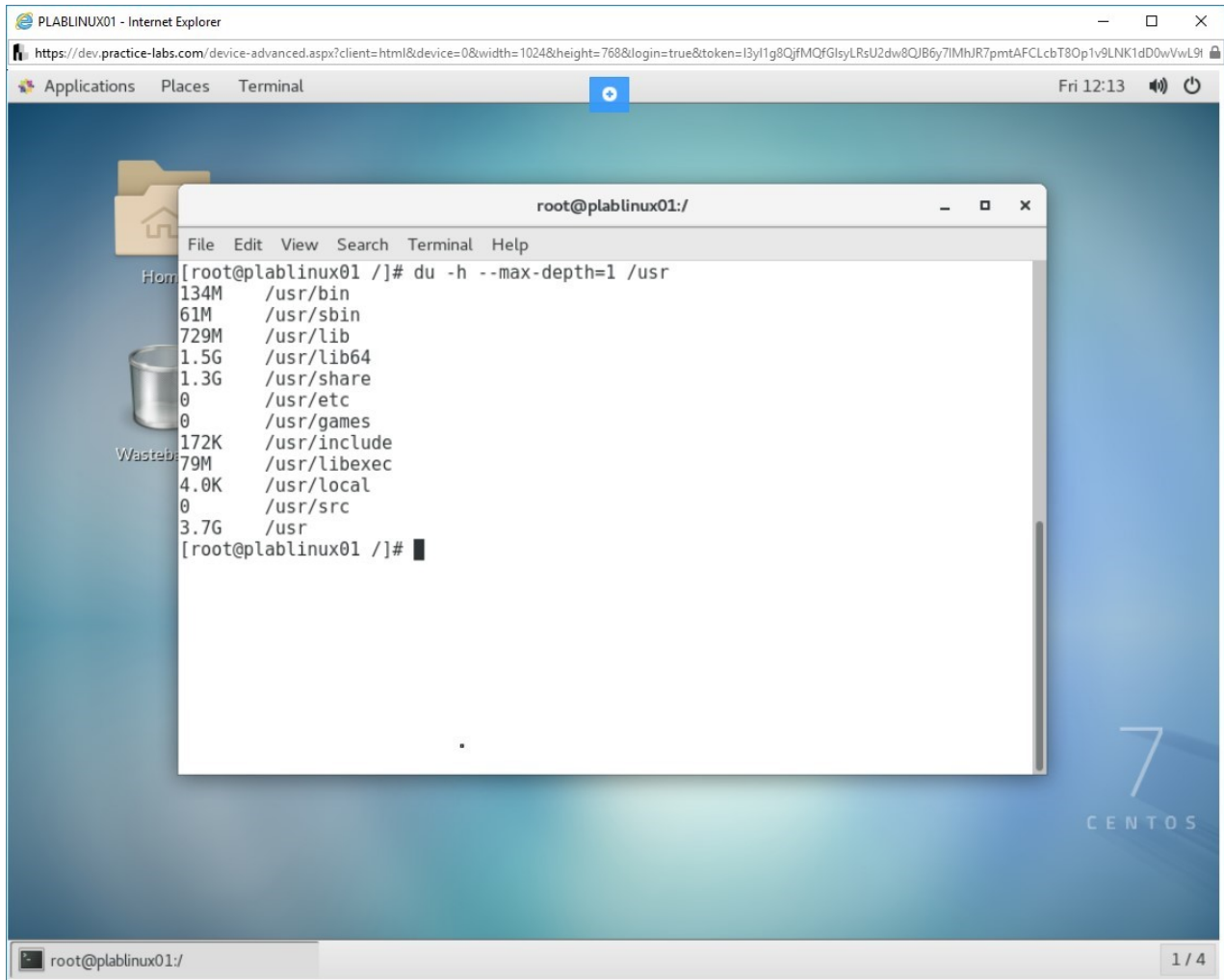


Figure 1.6 Screenshot of PLABLINUX01: Finding out the space taken up individually by the sub-directories and the total space taken up by the **/usr** directory

Step 7

Clear the screen by entering the following command:

```
clear
```

The swap partition is a separate partition that moves items from computer memory to its hard drive. You can check for the swap partition and its space in Linux by entering the following command:

```
swapon -s
```

Note: The swap partition size depends on the amount of RAM in the system.

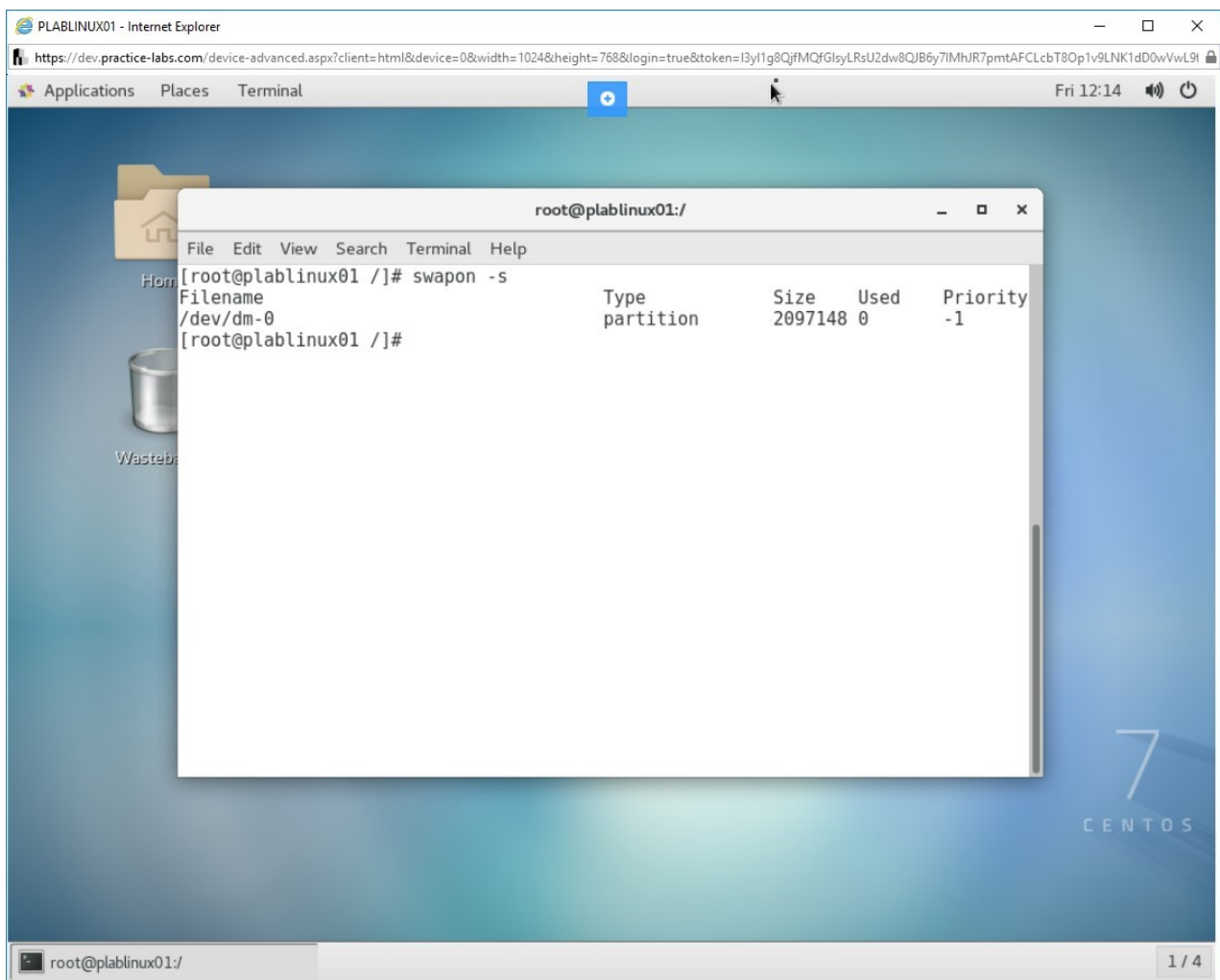


Figure 1.7 Screenshot of PLABINUX01: Verifying the swapon partition and its space using the swapon -s command.

Step 8

Clear the screen by entering the following command:

```
clear
```

You can also list all the partitions on the hard disk and their mount points by entering the following command:

mount

Note: Maximize the command terminal window.

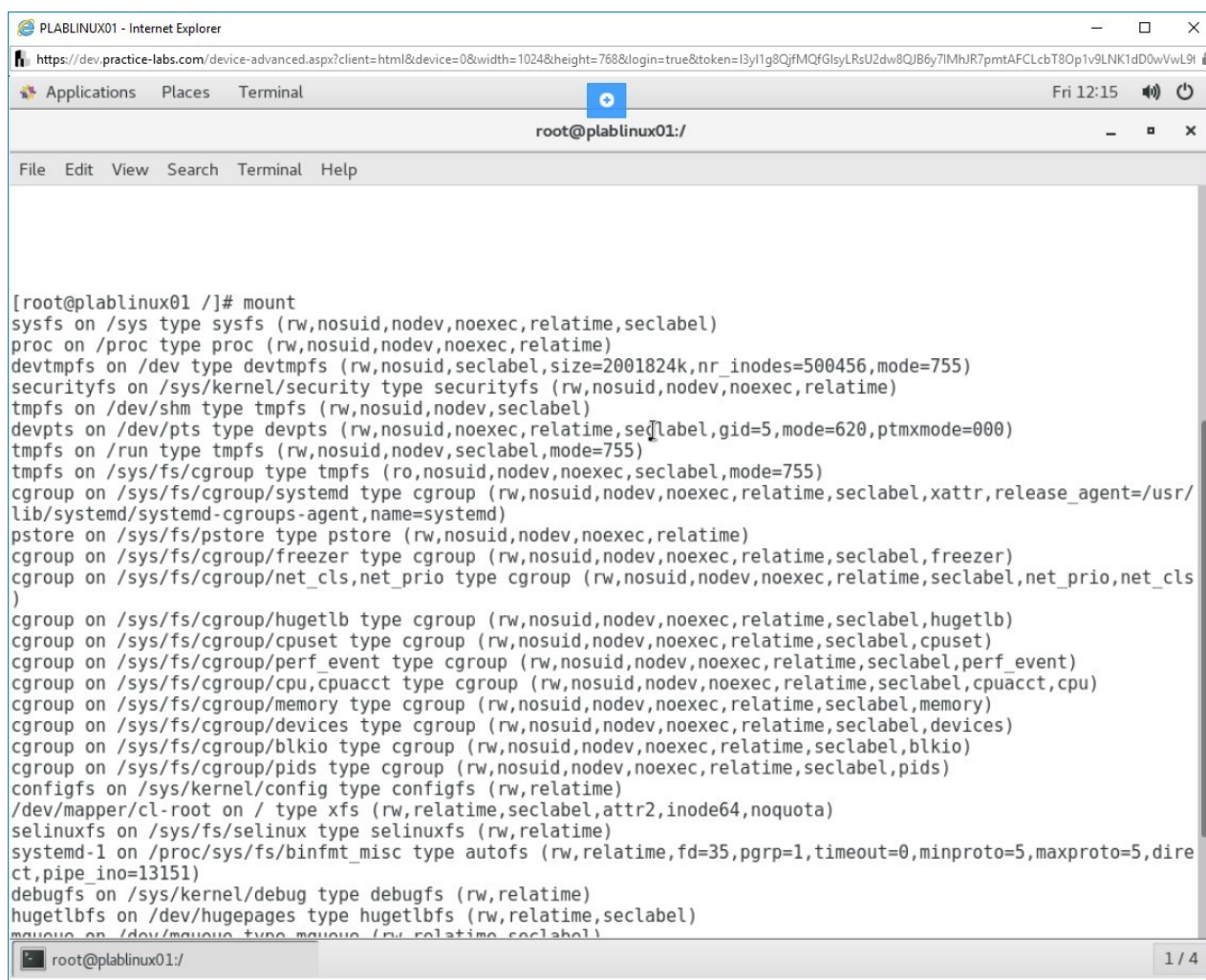
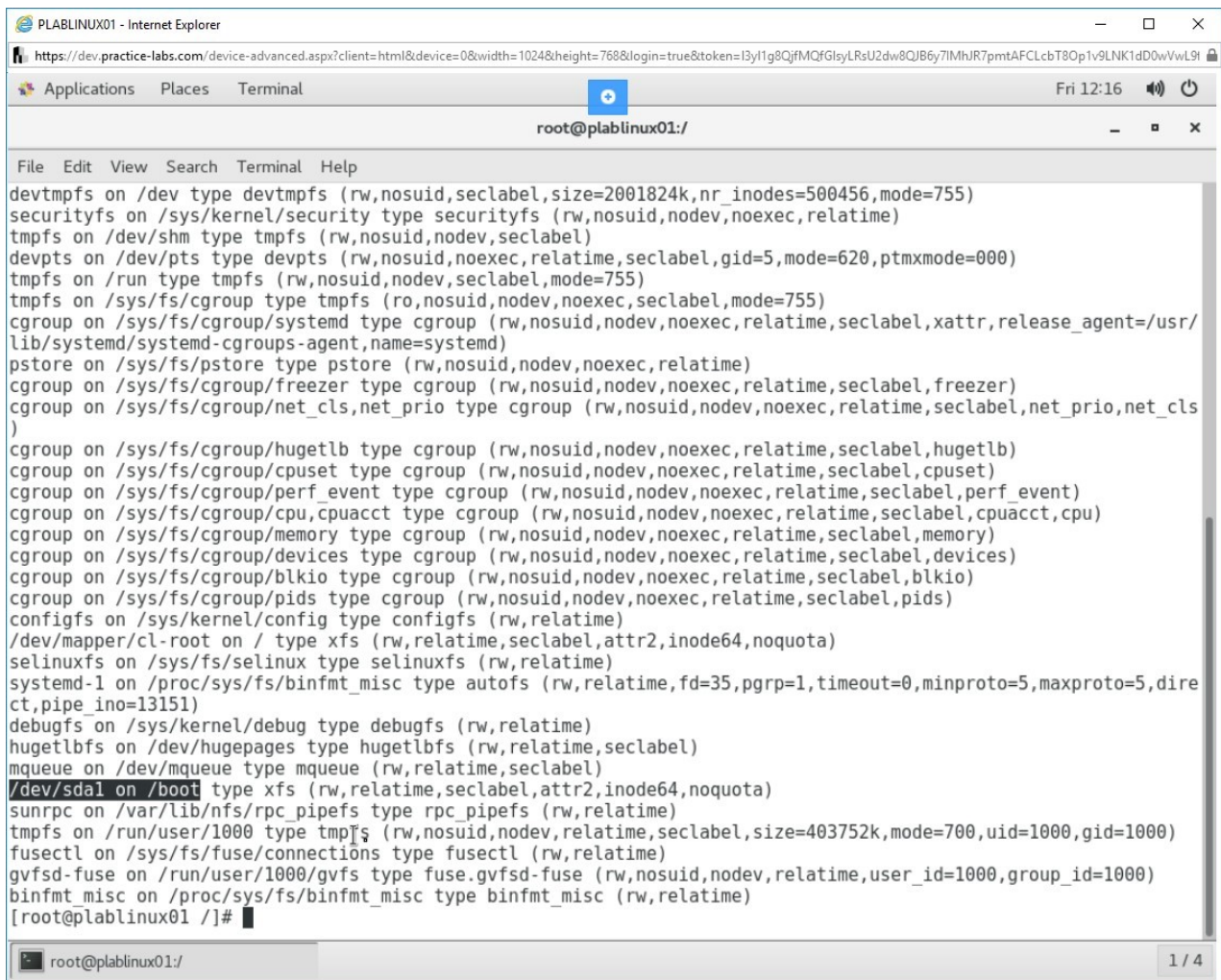
A screenshot of a web browser window titled 'PLABLINUX01 - Internet Explorer'. The address bar shows a URL from 'https://dev.practice-labs.com'. The browser has tabs for 'Applications', 'Places', and 'Terminal'. The 'Terminal' tab is active, showing a command prompt 'root@plablinux01:/' and the output of the 'mount' command. The output lists various filesystems and their mount points, including sysfs, proc, devtmpfs, securityfs, tmpfs, devpts, cgroup, pstore, freezer, net_cls, hugetlb, cpuset, perf_event, memory, devices, pids, configfs, xfs, autofs, debugfs, and hugetlbfs. The terminal window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The status bar at the bottom shows 'root@plablinux01:/' and '1 / 4'.

Figure 1.8 Screenshot of PLABLINUX01: Listing all the partitions on the hard disk and their mount points by using the mount command.

Step 9

In the output of the command, note that **/dev/sda1** is mounted on the **/boot** partition.



```
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=2001824k,nr_inodes=500456,mode=755)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,seclabel)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,mode=755)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,seclabel,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,xattr,release_agent=/usr/lib/systemd/systemd-cgroups-agent,name=systemd)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,freezer)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,net_prio,net_cls)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,hugetlb)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,cpuset)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,perf_event)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,cpuacct,cpu)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,memory)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,devices)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,blkio)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,seclabel,pids)
configfs on /sys/kernel/config type configfs (rw,relatime)
/dev/mapper/cl-root on / type xfs (rw,relatime,seclabel,attr2,inode64,noquota)
selinuxfs on /sys/fs/selinux type selinuxfs (rw,relatime)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=35,pgrp=1,timeout=0,minproto=5,maxproto=5,direct,pipe_ino=13151)
debugfs on /sys/kernel/debug type debugfs (rw,relatime)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel)
mqueue on /dev/mqueue type mqueue (rw,relatime,seclabel)
/dev/sda1 on /boot type xfs (rw,relatime,seclabel,attr2,inode64,noquota)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw,relatime)
tmpfs on /run/user/1000 type tmpfs (rw,nosuid,nodev,relatime,seclabel,size=403752k,mode=700,uid=1000,gid=1000)
fusectl on /sys/fs/fuse/connections type fusectl (rw,relatime)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,relatime,user_id=1000,group_id=1000)
binfmt_misc on /proc/sys/fs/binfmt_misc type binfmt_misc (rw,relatime)
[root@plablinux01 /]#
```

Figure 1.9 Screenshot of PLABLINUX01: Verifying that /dev/sda1 is mounted on the /boot partition.

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

Review

Well done, you have completed the **Design Hard Disk Layout** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Design Hard Disk Layout

You should now be able to:

- Ensure the /boot partition conforms to the hardware architecture

Feedback

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