CompTIA Linux+

Automate System Administration Tasks by Scheduling Jobs

- **Introduction**
- **Lab Topology**
- **Exercise 1 - Automate System Administration Tasks by Scheduling Jobs**
- **Review**

Introduction

Welcome to the **Automate System Administration Tasks by Scheduling Jobs** Practice Lab. In this module you will be provided with the instructions and devices needed to develop your hands-on skills.

Administration
Automation System
Configuration

Learning Outcomes

In this module, you will complete the following exercise:

- Exercise 1 - Automate System Administration Tasks by Scheduling Jobs

After completing this lab, you will be able to:

- Manage cron and at jobs
- Configure user access to cron and at services
- Configure anacron

Exam Objectives

The following exam objectives are covered in this lab:

- **LPI:** 107.2 Automate system administration tasks by scheduling jobs
- **CompTIA: 2.6** Given a scenario, automate and schedule jobs.

__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.

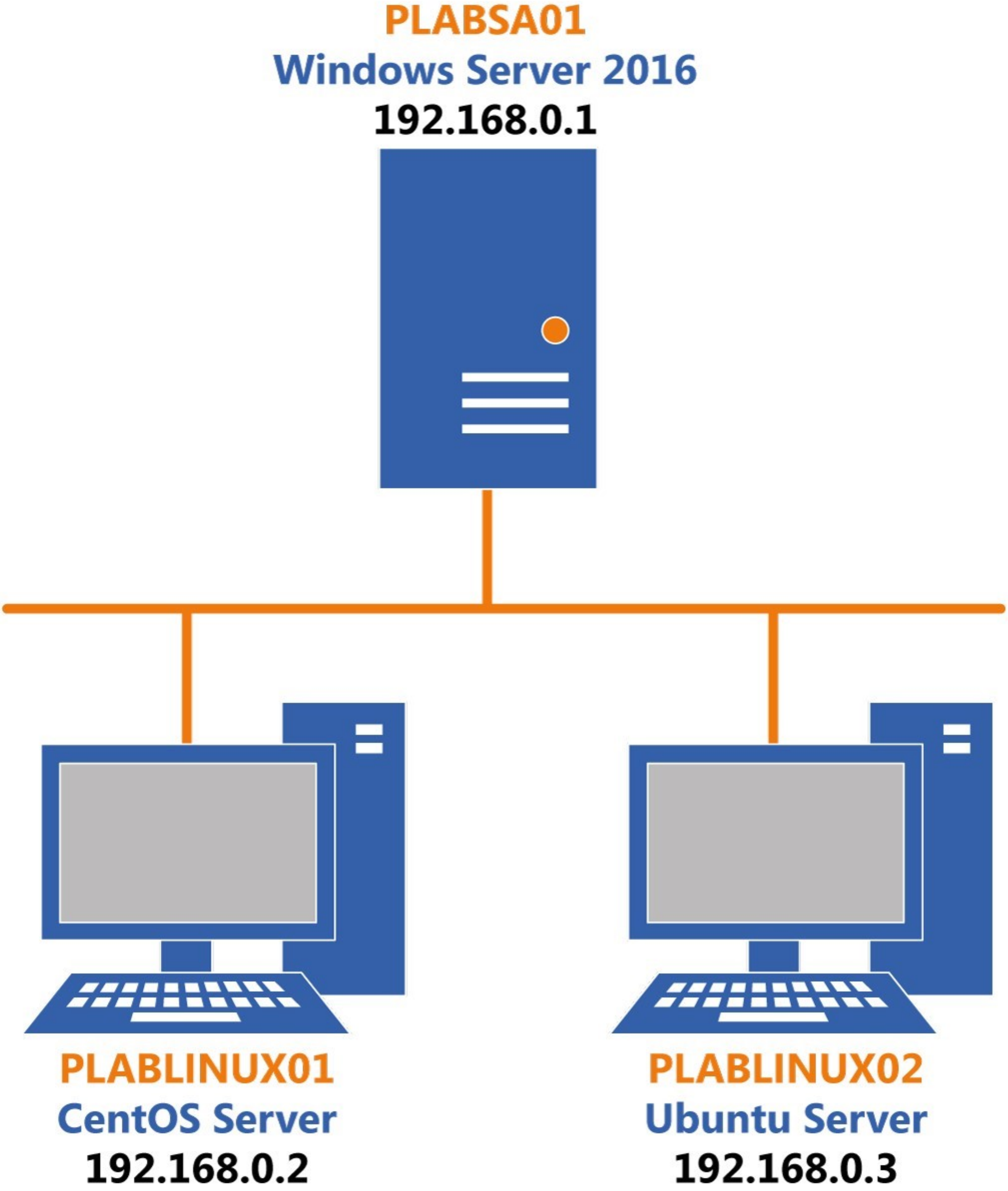
Help and Support

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 - Automate System Administration Tasks by Scheduling Jobs

In this exercise, you will understand how to maintain system time.

Learning Outcomes

After completing this exercise, you will be able to:

- Log into a Linux System
- Manage cron and at jobs
- Configure user access to cron and at services
- Configure anacron

Your Devices

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

- **PLABLINUX01** (CentOS Server)

Task 1 - Manage cron and at Jobs

Linux offers two commands that can help you automate tasks. One such command is **cron**, which can be used to schedule recurring periodic activities. The other command is **at**, which can be used to execute single commands at a scheduled time.

The **cron** command uses text files that contain commands to execute them. These files are known as **crontabs**. These files must be located in a directory named **/var/spool/cron**.

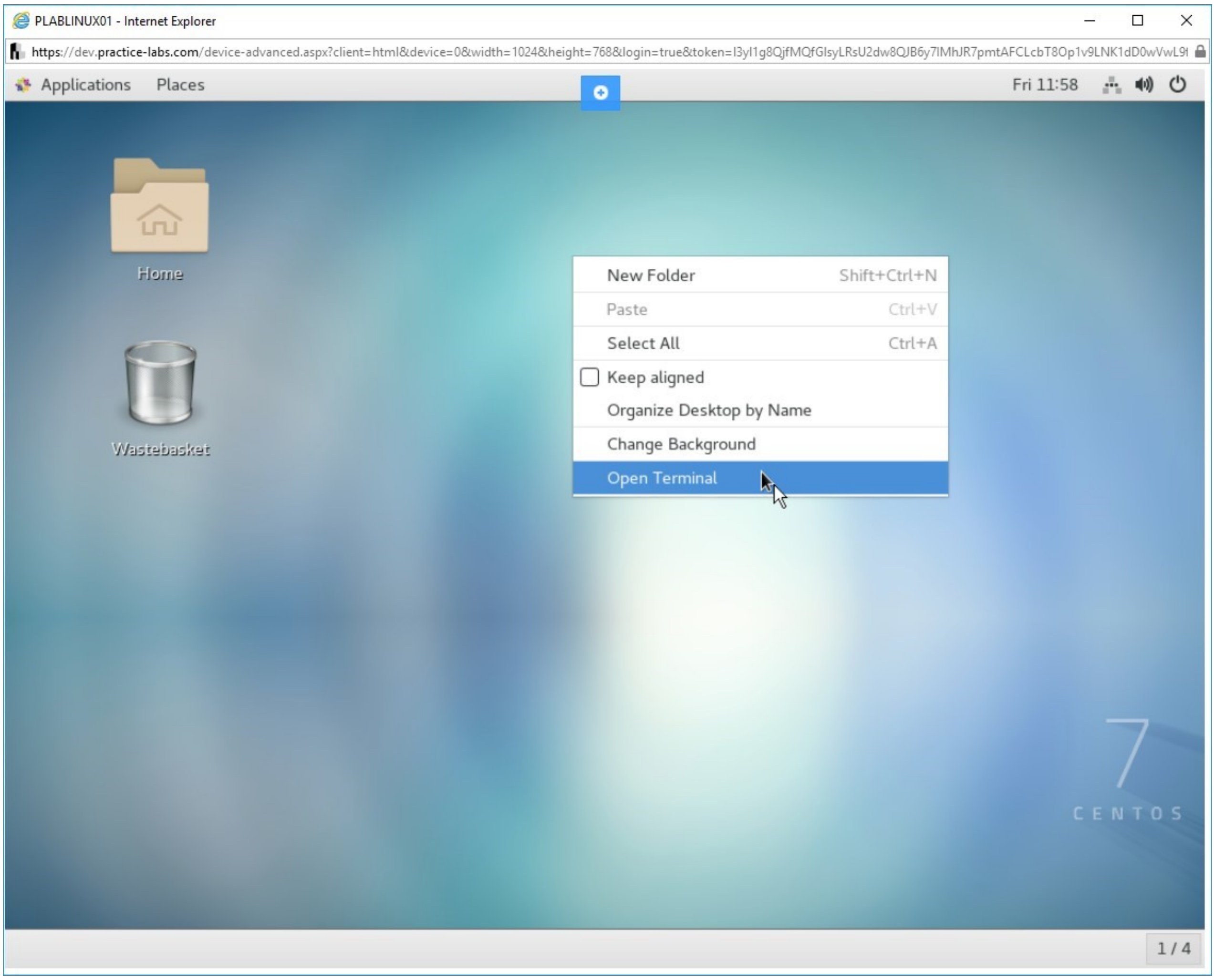
It is important to note that cron is not a program in itself. It consists of two components: **crond** and **crontab**. **crond** is the daemon that executes the commands. A table manipulation program accesses the **crontab** files.

The key difference between **cron** and **at** command is that the **at** command allows you to execute commands or files at the time of your choice. For example, you can define the 7:15AM tomorrow morning. The **cron** executes at period intervals, like weeks or days.

To manage **cron** and **at** jobs, perform the following steps:

Step 1

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

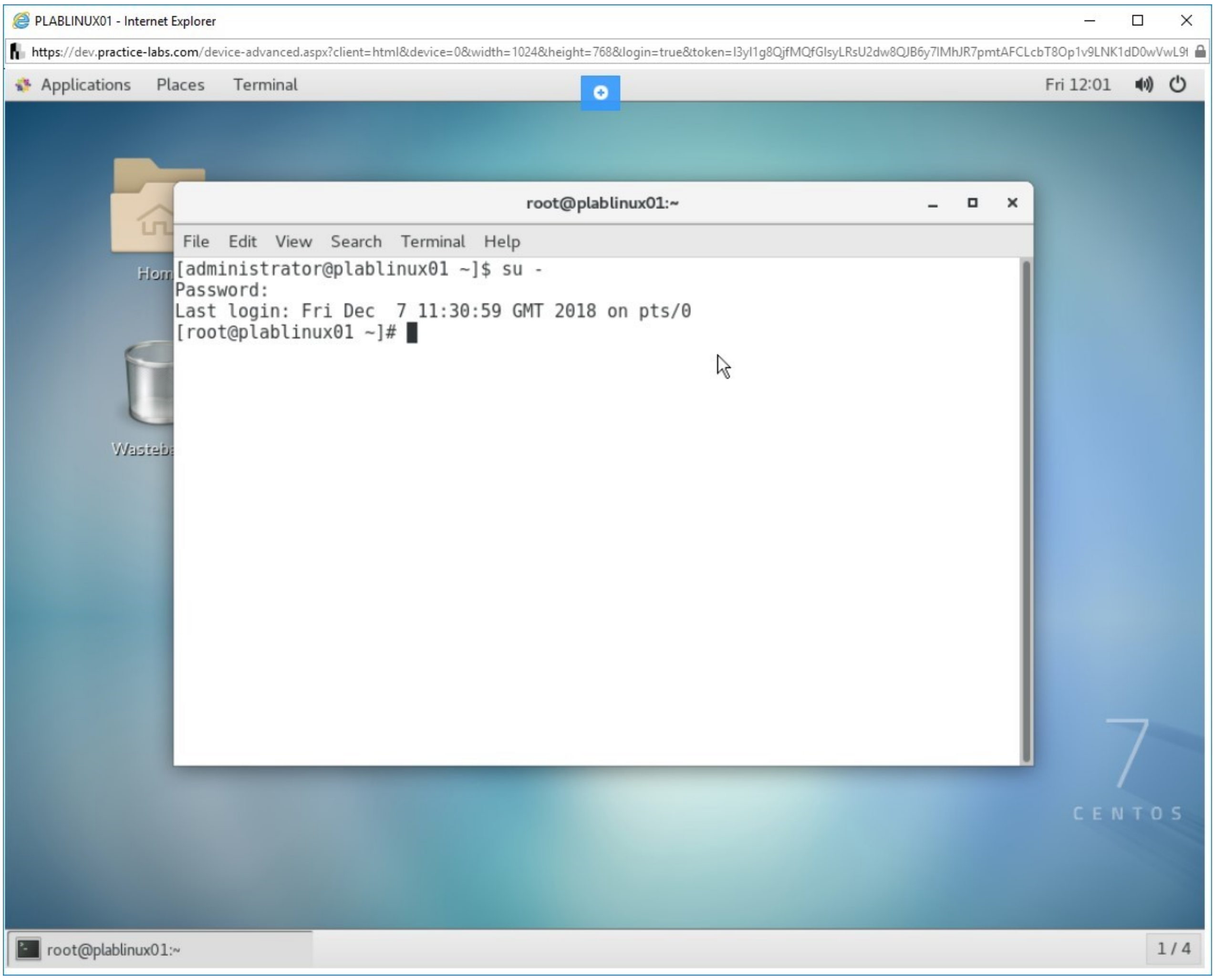
```
su -
```

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
Edit
View
Search
Terminal
Help
Hom
Wasteb
7
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 to the root account with the su command.

Step 3

Clear the screen by entering the following command:

```
Clear
```

> ***Note***: *The clear command should be used to clear the screen clutter. This enables 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.*

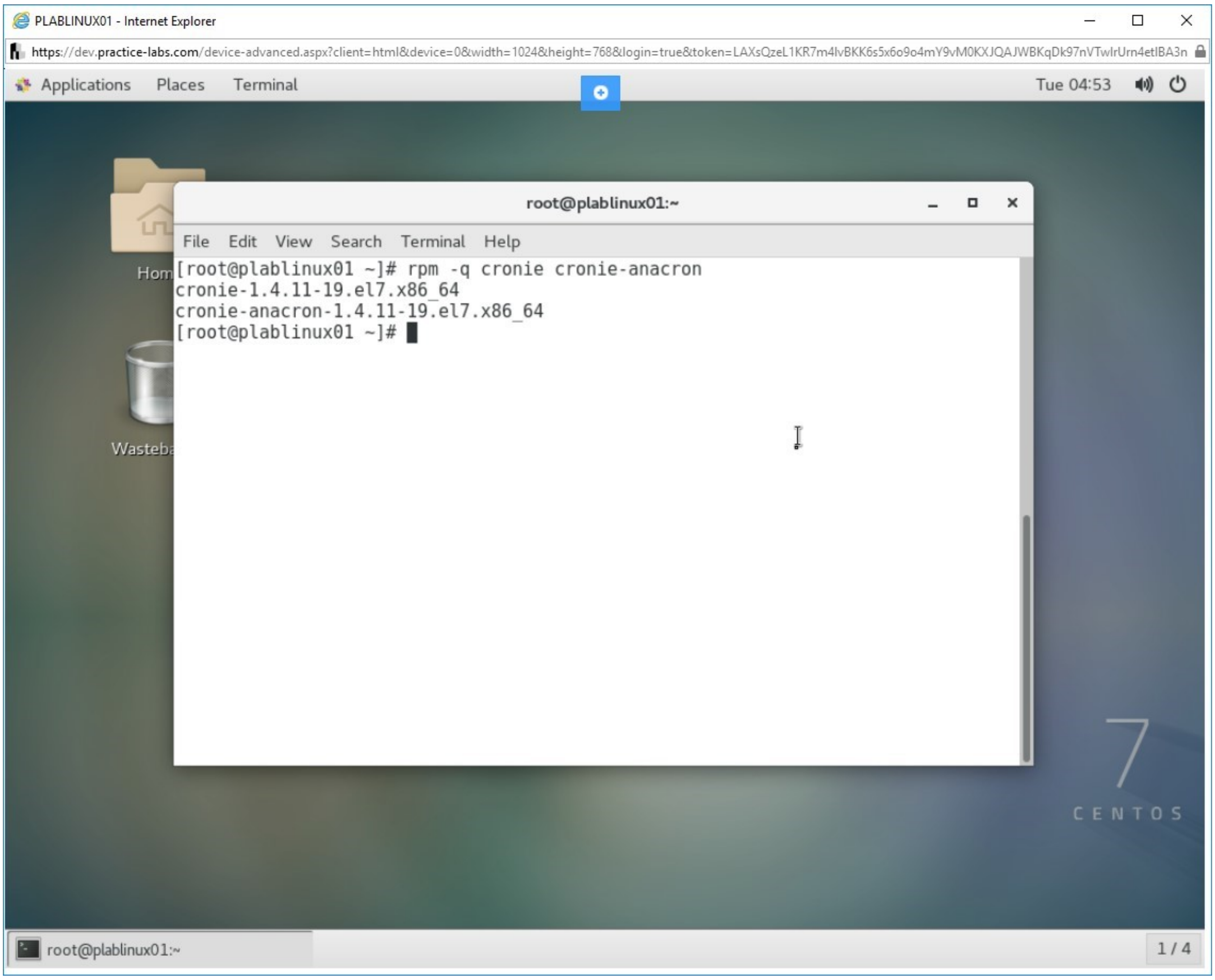
Let's first check whether the **cron** package is installed. To check for the **cron** package, type the following command:

```
rpm -q cronie cronie-anacron
```

Press **Enter**.

Note that the cron package is installed.

> ***Note***: *If the cron package is not installed, then you can use the following command:* ***yum install cronie cronie-anacron*** *to install the package.*



```
[root@plablinux01 ~]# rpm -q cronie cronie-anacron
cronie-1.4.11-19.el7.x86_64
cronie-anacron-1.4.11-19.el7.x86_64
[root@plablinux01 ~]#
```

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Applications
Places
Terminal
Tue 04:53
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
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Wasteb
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CENTOS
root@plablinux01:~
1 / 4

Figure 1.3 Screenshot of PLABLINUX01: Checking for the cron package.

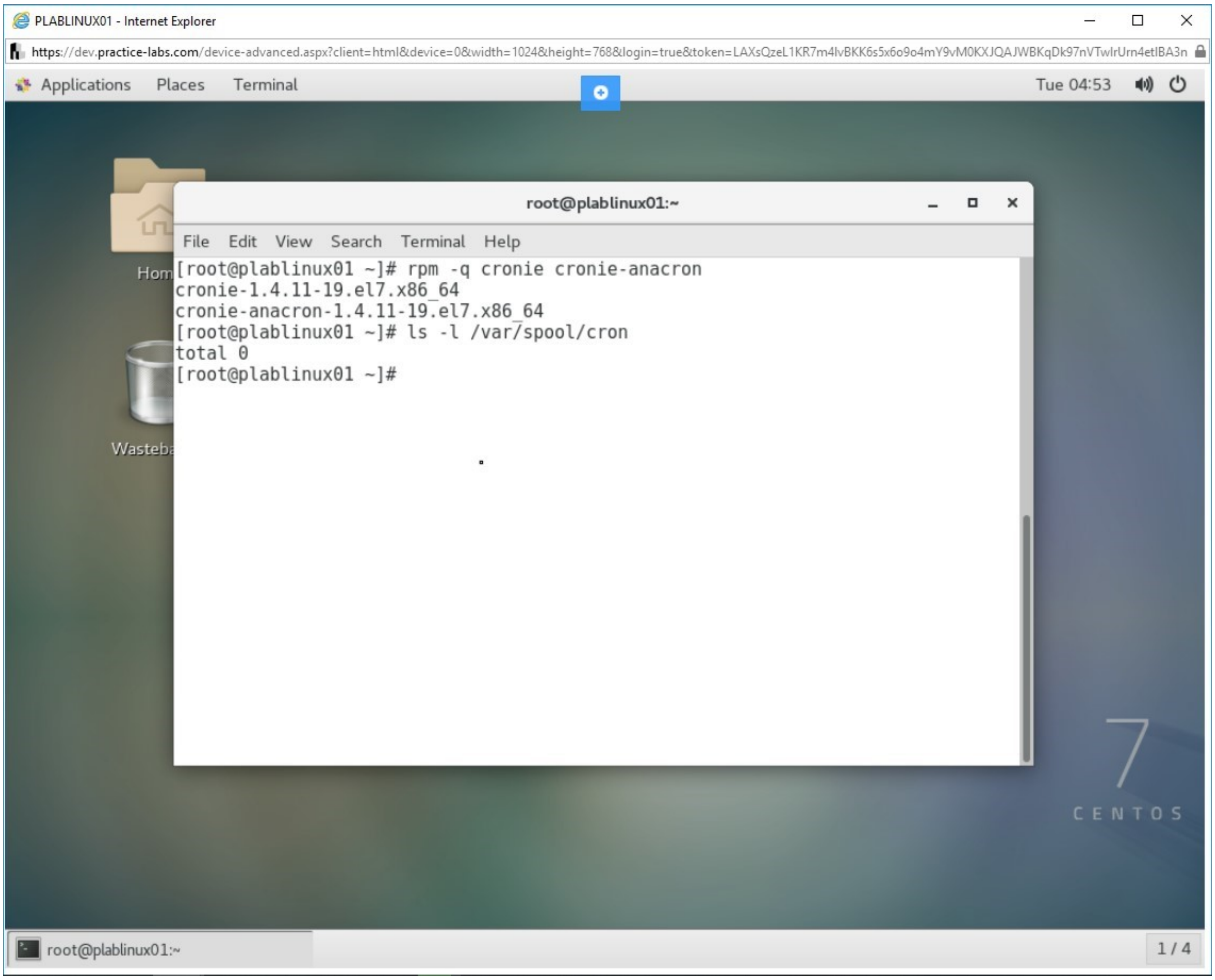
Step 4

To check whether the **crontabs** are readily available, type the following command:

```
ls -l /var/spool/cron
```

Press **Enter**.

At present, there are no **crontabs** available.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Applications
Places
Terminal
Tue 04:53
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# rpm -q cronie cronie-anacron
cronie-1.4.11-19.el7.x86_64
cronie-anacron-1.4.11-19.el7.x86_64
[root@plablinux01 ~]# ls -l /var/spool/cron
total 0
[root@plablinux01 ~]#
```

Figure 1.4 Screenshot of PLABLINUX01: Checking whether the crontabs are readily available.

Step 5

Clear the screen by entering the following command:

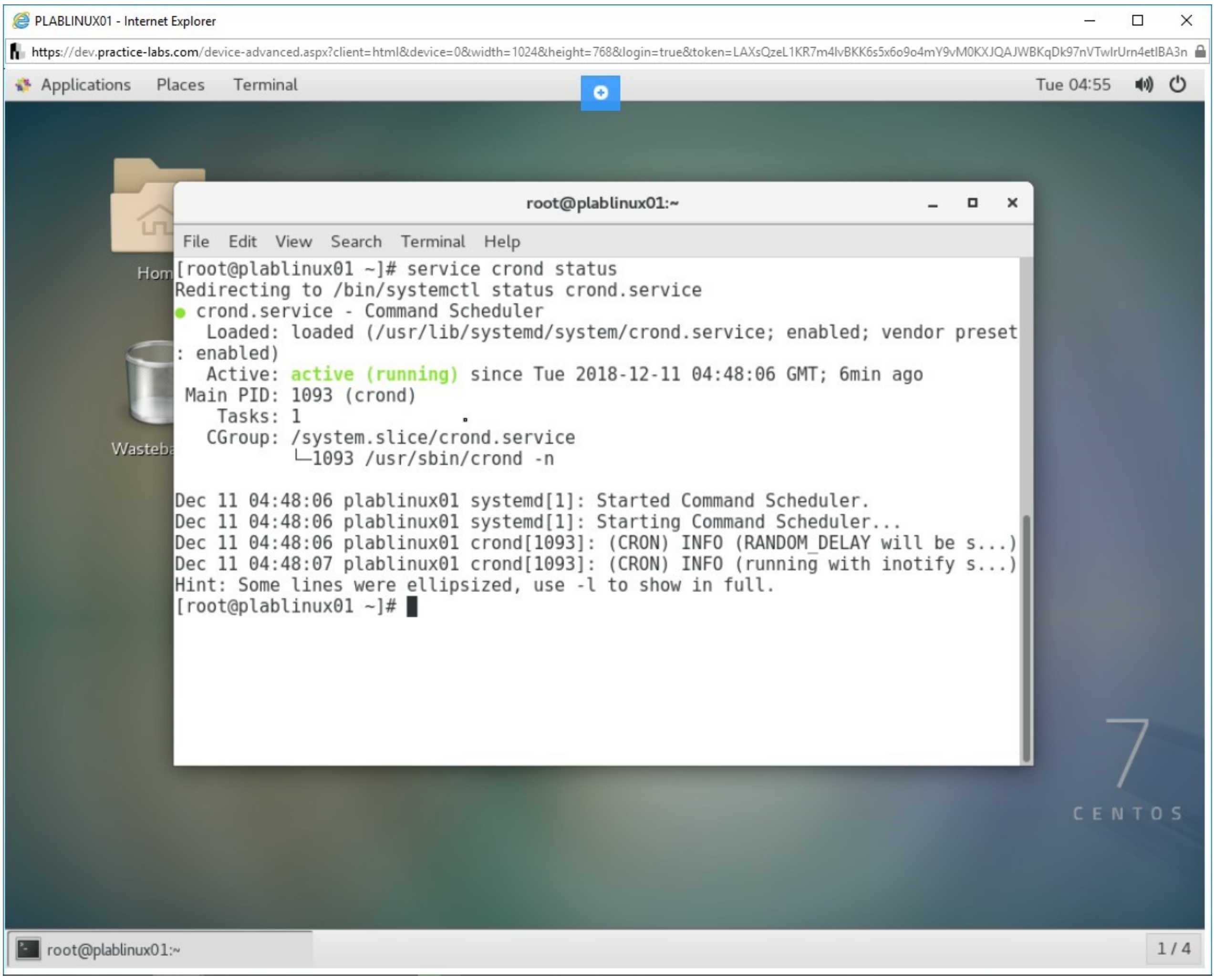
```
clear
```

To check whether the **cron** service is running, type the following command:

```
service crond status
```

Press **Enter**.

Notice that the service is active and running on the system.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Applications
Places
Terminal
Tue 04:55
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# service crond status
Redirecting to /bin/systemctl status crond.service
● crond.service - Command Scheduler
   Loaded: loaded (/usr/lib/systemd/system/crond.service; enabled; vendor preset
: enabled)
   Active: active (running) since Tue 2018-12-11 04:48:06 GMT; 6min ago
 Main PID: 1093 (crond)
    Tasks: 1
   CGroup: /system.slice/crond.service
           └─1093 /usr/sbin/crond -n

Dec 11 04:48:06 plablinux01 systemd[1]: Started Command Scheduler.
Dec 11 04:48:06 plablinux01 systemd[1]: Starting Command Scheduler...
Dec 11 04:48:06 plablinux01 crond[1093]: (CRON) INFO (RANDOM_DELAY will be s...)
Dec 11 04:48:07 plablinux01 crond[1093]: (CRON) INFO (running with inotify s...)
Hint: Some lines were ellipsized, use -l to show in full.
[root@plablinux01 ~]#
```

Figure 1.5 Screenshot of PLABLINUX01: Checking whether cron service is running.

Step 6

Clear the screen by entering the following command:

```
clear
```

The main configuration file for **cron** is the **/etc/crontab** file. To check whether the**/etc/crontab** file contains any command, type the following command:

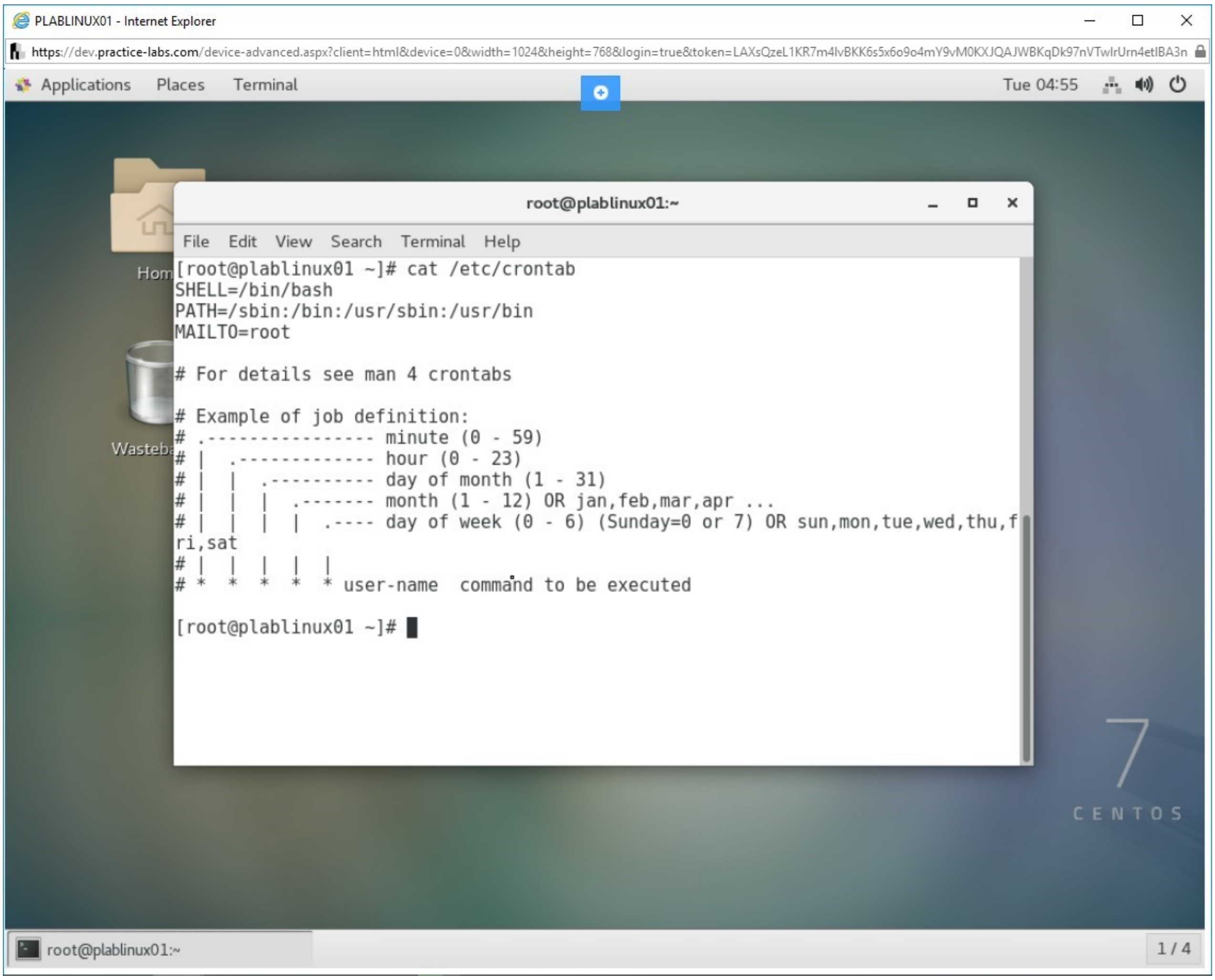
```
cat /etc/crontab
```

Press **Enter**.

In the output displayed, notice that the first three lines contain the variables used to configure the environment in which the cron jobs are run.

The remaining lines represent the details of a job:

- **minute** — any integer from 0 to 59
- **hour** — any integer from 0 to 23
- **day** — any integer from 1 to 31
- **month** — any integer from 1 to 12
- **dayofweek** — any integer from 0 to 7
- **command** — the command to execute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Applications
Places
Terminal
Tue 04:55
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wasteb
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .---------------- minute (0 - 59)
# |  .------------- hour (0 - 23)
# |  |  .---------- day of month (1 - 31)
# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...
# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,f
ri,sat
# |  |  |  |  |
# *  *  *  *  * user-name  command to be executed

[root@plablinux01 ~]# 
```

Figure 1.6 Screenshot of PLABLINUX01: Viewing the /etc/crontab file.

Step 7

Note that these values can be used to execute the scripts in the following directories:

- **/etc/cron.hourly/**
- **/etc/cron.daily/**
- **/etc/cron.weekly/**

- **/etc/cron.monthly/**

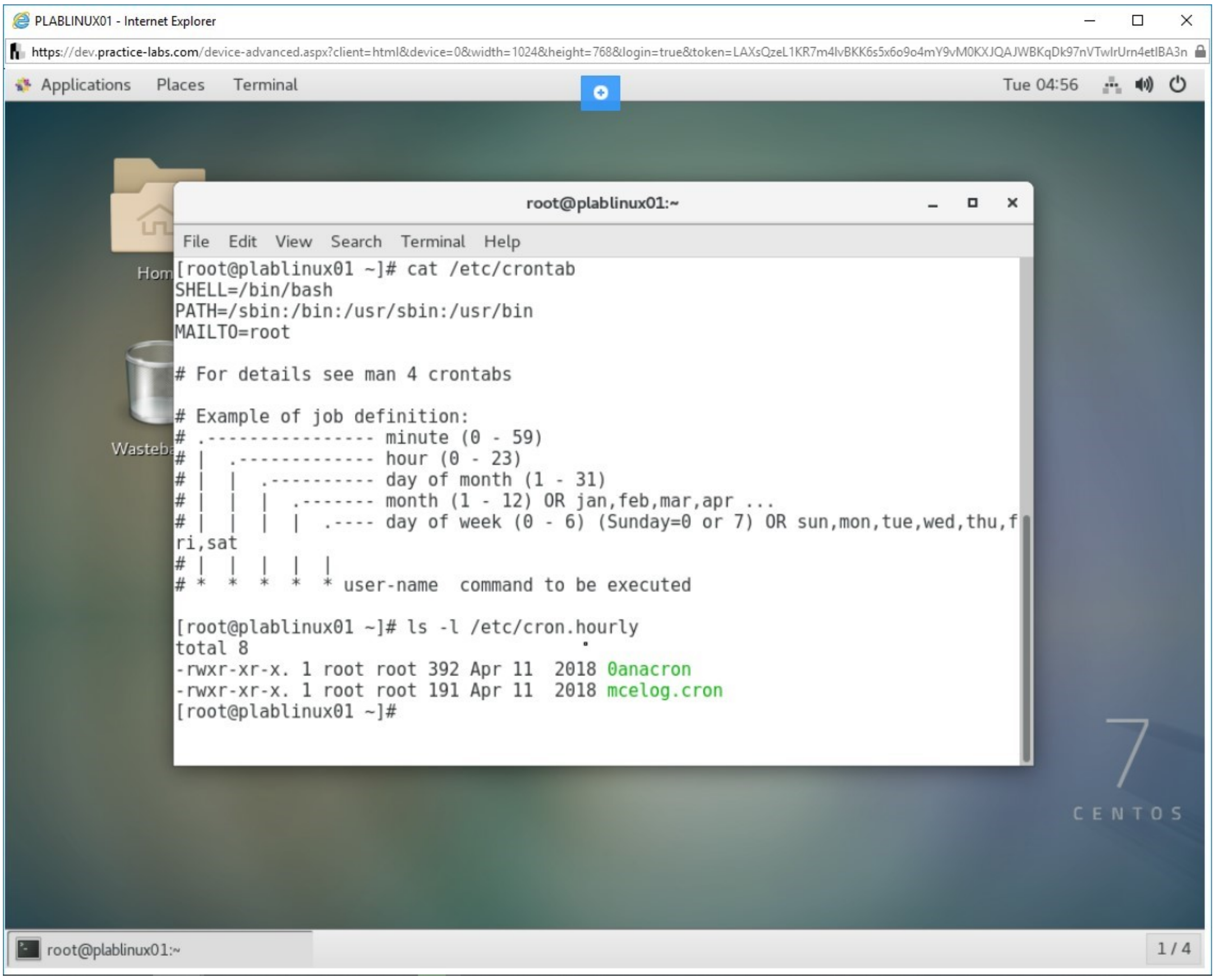
> ***Note**: The files in these directories must support a .sh extension, which denotes that these are shell scripts.*

To view the files, for example in **/etc/cron.hourly**, type the following command:

```
ls -l /etc/cron.hourly
```

Press **Enter**.

You can similarly check for the other directories.



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Applications
Places
Terminal
Tue 04:56
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .---------------- minute (0 - 59)
# |  .------------- hour (0 - 23)
# |  |  .---------- day of month (1 - 31)
# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...
# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,f
ri,sat
# |  |  |  |  |
# *  *  *  *  * user-name  command to be executed

[root@plablinux01 ~]# ls -l /etc/cron.hourly
total 8
-rwxr-xr-x. 1 root root 392 Apr 11  2018 0anacron
-rwxr-xr-x. 1 root root 191 Apr 11  2018 mcelog.cron
[root@plablinux01 ~]#
```

Figure 1.7 Screenshot of PLABLINUX01: Viewing the /etc/cron.hourly file.

Step 8

Clear the screen by entering the following command:

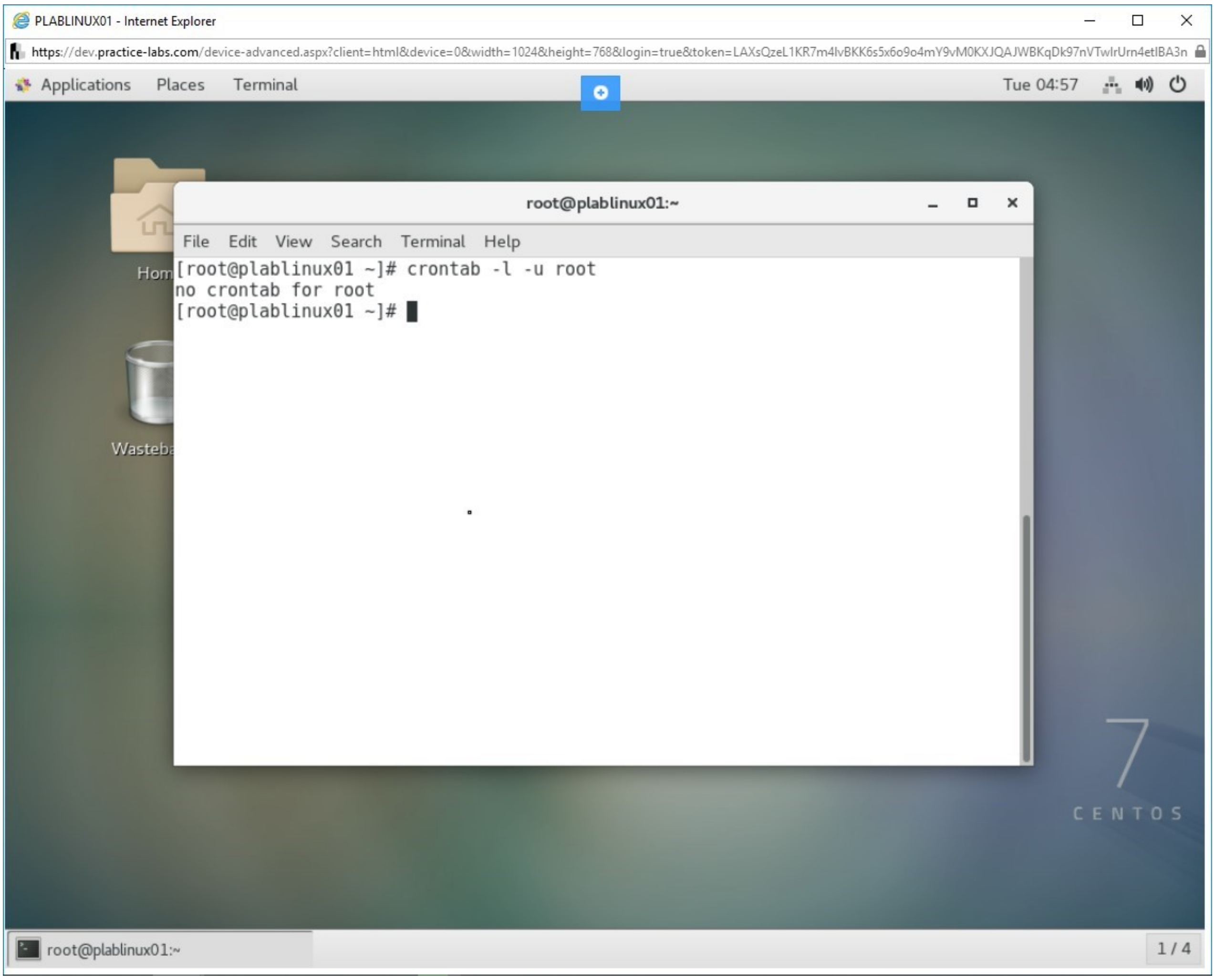
```
clear
```

You can check whether a user has one or more **crontab** files. You must specify the username with the **crontab** command.

To check for a user's **crontab** files, type the following command:

```
crontab -l -u root
```

Press **Enter**.



```
[root@plablinux01 ~]# crontab -l -u root
no crontab for root
[root@plablinux01 ~]#
```

PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 04:57
root@plablinux01:~
File
Edit
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Terminal
Help
Home
Wastebasket
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CENTOS
root@plablinux01:~
1 / 4

Figure 1.8 Screenshot of PLABLINUX01: Checking for the user’s crontab files.

Step 9

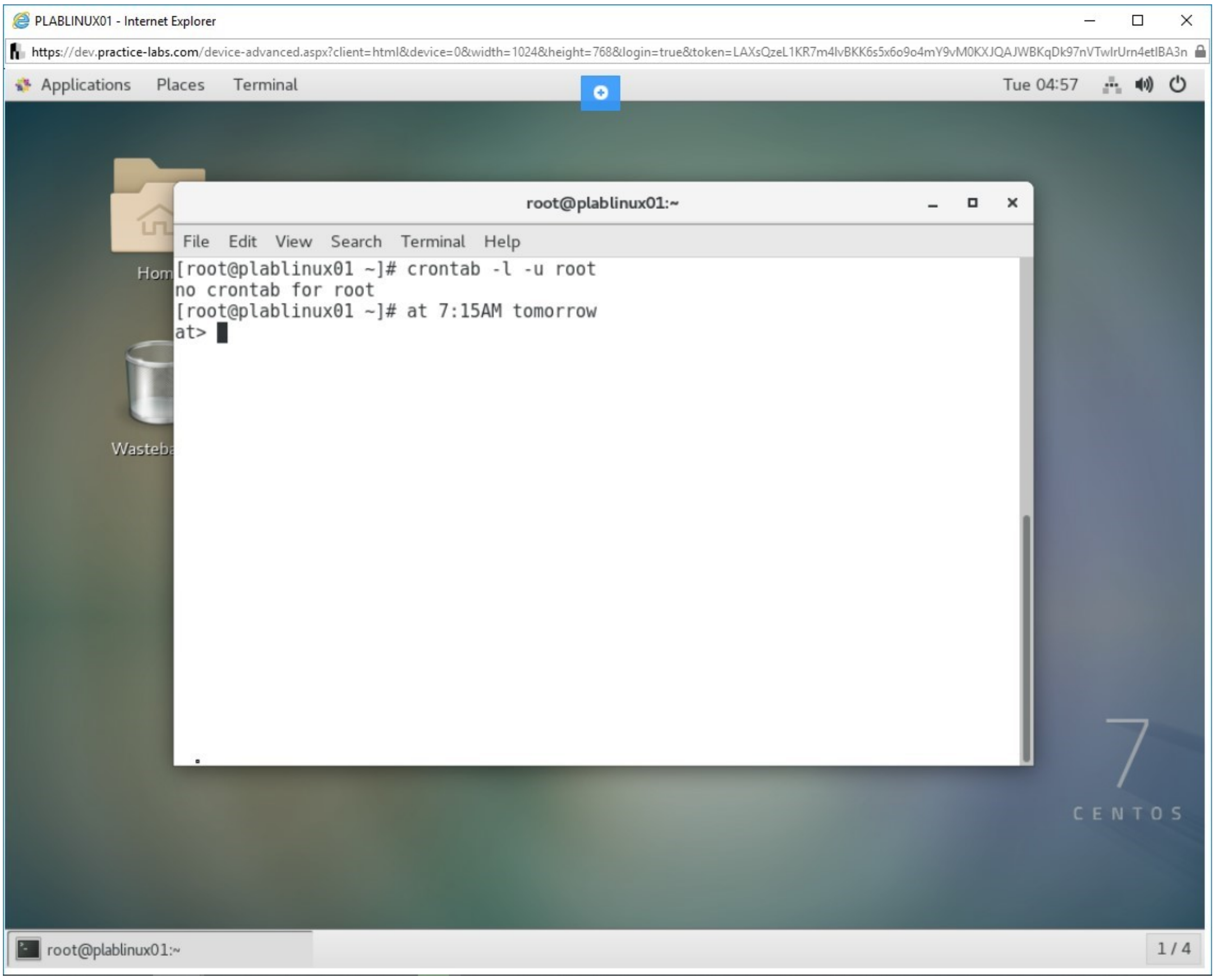
You can also use the **at** command to schedule jobs.

To execute the **at** command, type the following command:

```
at 7:15AM tomorrow
```

Press **Enter**.

Notice that the command prompt changes to **at** command prompt.



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Applications
Places
Terminal
Tue 04:57
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
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7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# crontab -l -u root
no crontab for root
[root@plablinux01 ~]# at 7:15AM tomorrow
at> 
```

Figure 1.9 Screenshot of PLABLINUX01: Configuring the at command to execute at a specific time.

Step 10

On the **at** command prompt, enter one or more commands that you want to execute at the specified time. Notice that the commands are executed in sequential order.

To specify the commands to be executed at the defined time, type the following command:

```
ls -l
```

Press **Enter**.

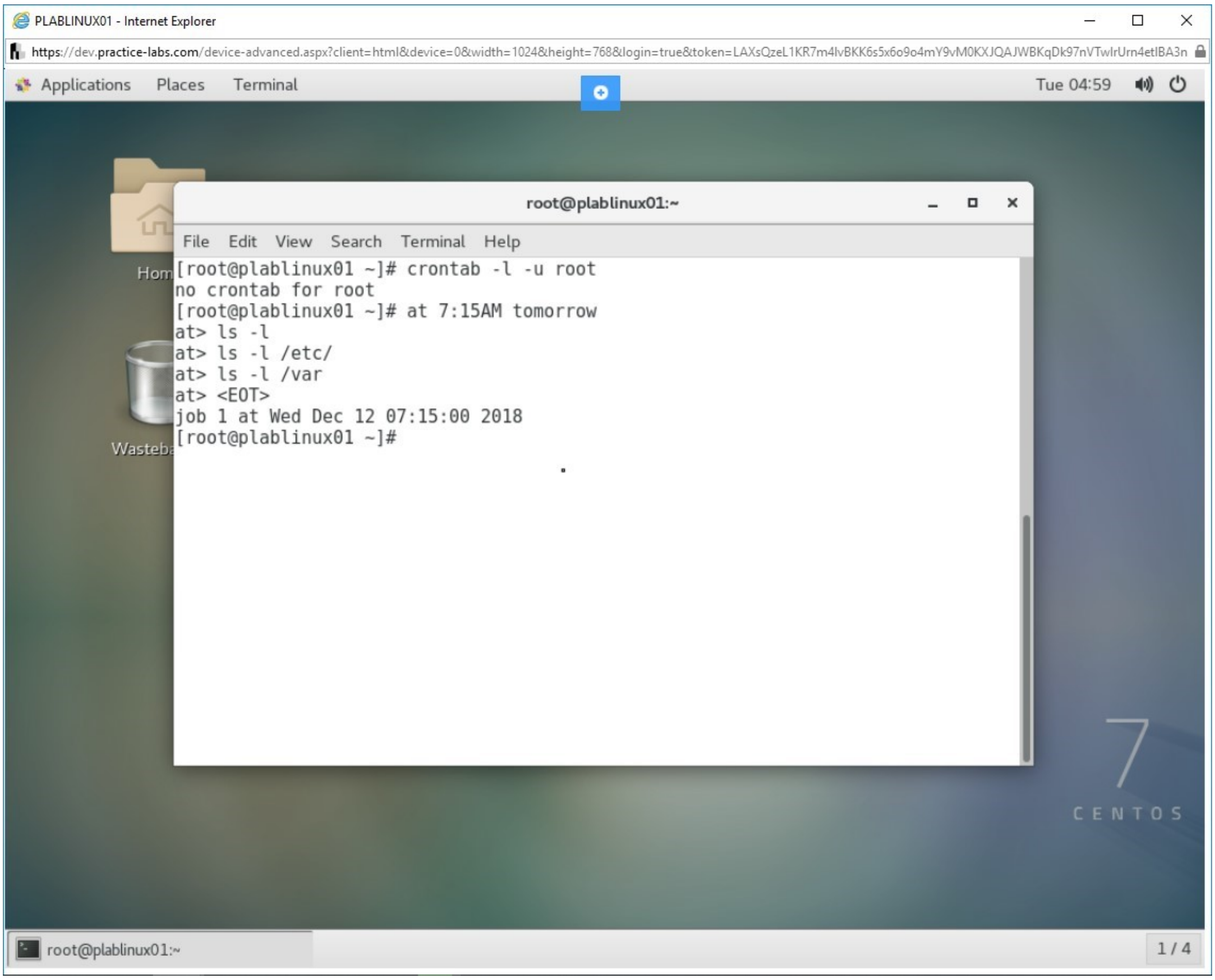
```
ls -l /etc/
```

Press **Enter**.

```
ls -l /var
```

Press **Enter**.

Press **CTRL+D** to exit the **at** command prompt.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Applications
Places
Terminal
Tue 04:59
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# crontab -l -u root
no crontab for root
[root@plablinux01 ~]# at 7:15AM tomorrow
at> ls -l
at> ls -l /etc/
at> ls -l /var
at> <EOT>
job 1 at Wed Dec 12 07:15:00 2018
[root@plablinux01 ~]#
```

Figure 1.10 Screenshot of PLABLINUX01: Specifying the commands to be executed at the specified time.

Step 11

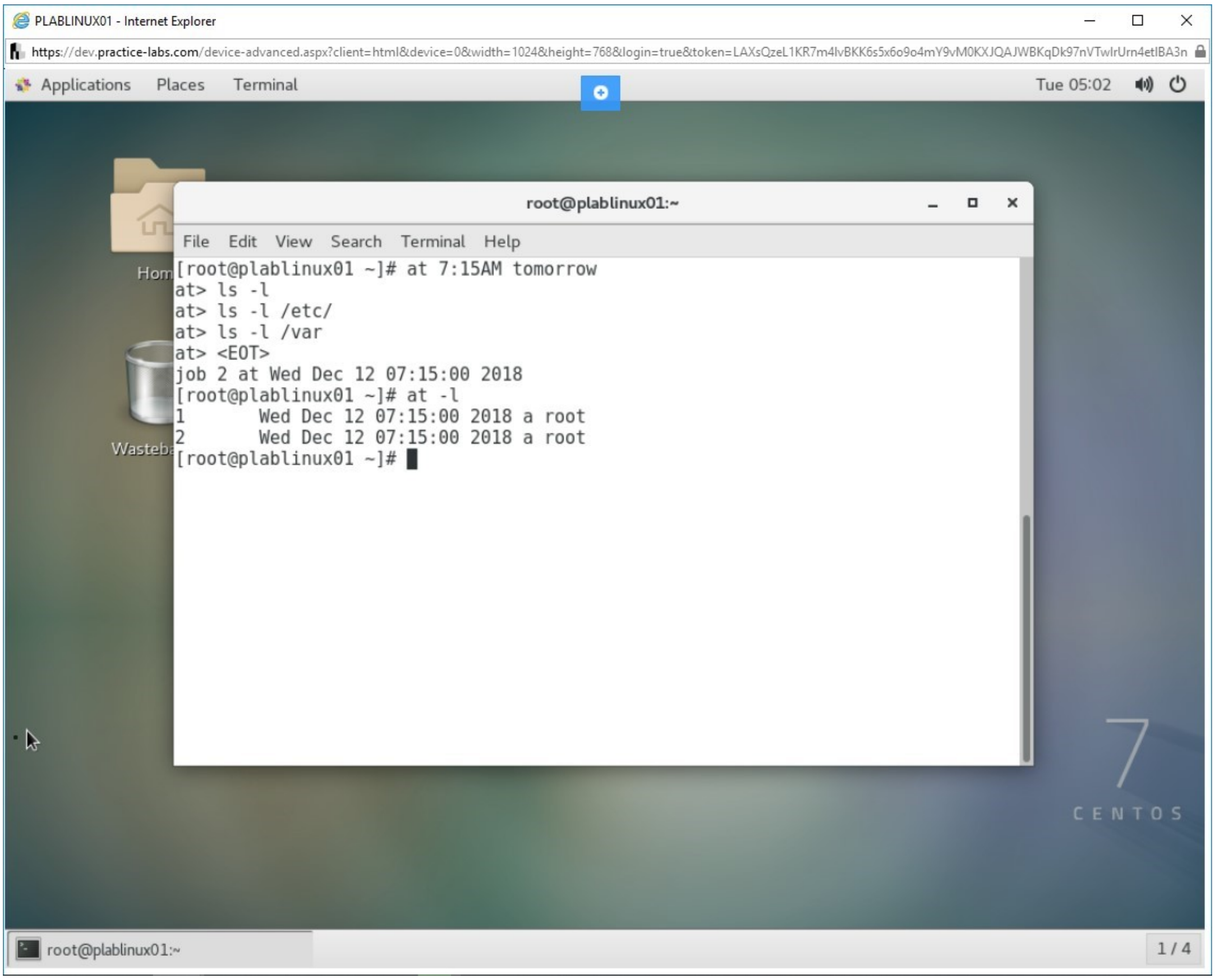
Clear the screen by entering the following command:

```
clear
```

You can also list the jobs that are in the queue. To do so, type the following command:

```
at -l
```

Press **Enter**.



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Applications
Places
Terminal
Tue 05:02
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# at 7:15AM tomorrow
at> ls -l
at> ls -l /etc/
at> ls -l /var
at> <EOT>
job 2 at Wed Dec 12 07:15:00 2018
[root@plablinux01 ~]# at -l
1       Wed Dec 12 07:15:00 2018 a root
2       Wed Dec 12 07:15:00 2018 a root
[root@plablinux01 ~]#
```

Figure 1.11 Screenshot of PLABLINUX01: Listing the jobs in the queue.

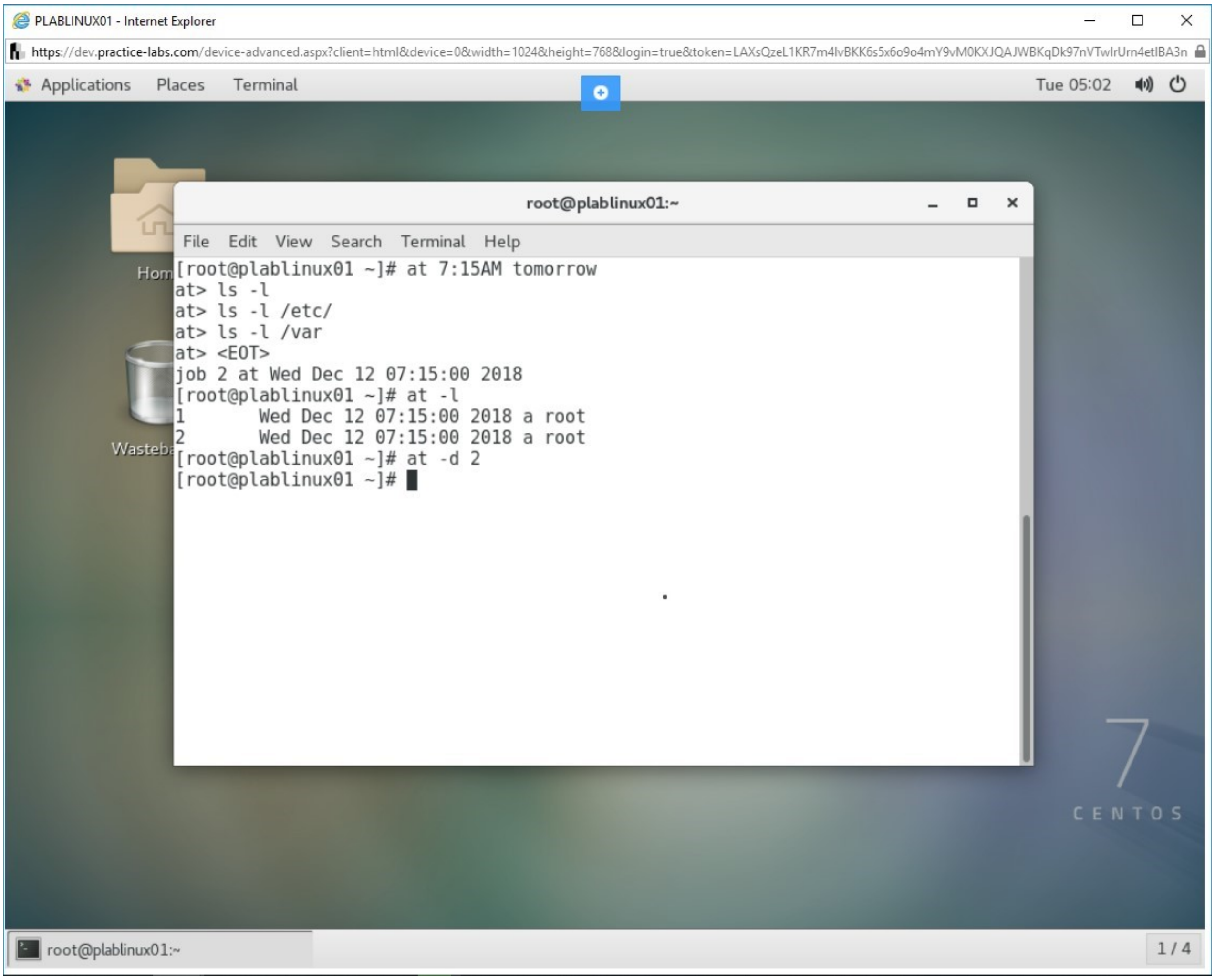
Step 12

To delete a job from the queue, type the following command:

```
at -d 2
```

Press **Enter**.

> ***Note**: 2 is the job number. Notice that the job number is displayed in the line below the <EOT> mark at the end of the **at** command prompt. You may have a different number of jobs. You can change the job number in the command if required.*


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:02
root@plablinux01:~
File
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Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# at 7:15AM tomorrow
at> ls -l
at> ls -l /etc/
at> ls -l /var
at> <EOT>
job 2 at Wed Dec 12 07:15:00 2018
[root@plablinux01 ~]# at -l
1       Wed Dec 12 07:15:00 2018 a root
2       Wed Dec 12 07:15:00 2018 a root
[root@plablinux01 ~]# at -d 2
[root@plablinux01 ~]# 
```

Figure 1.12 Screenshot of PLABLINUX01: Deleting a job from the queue.

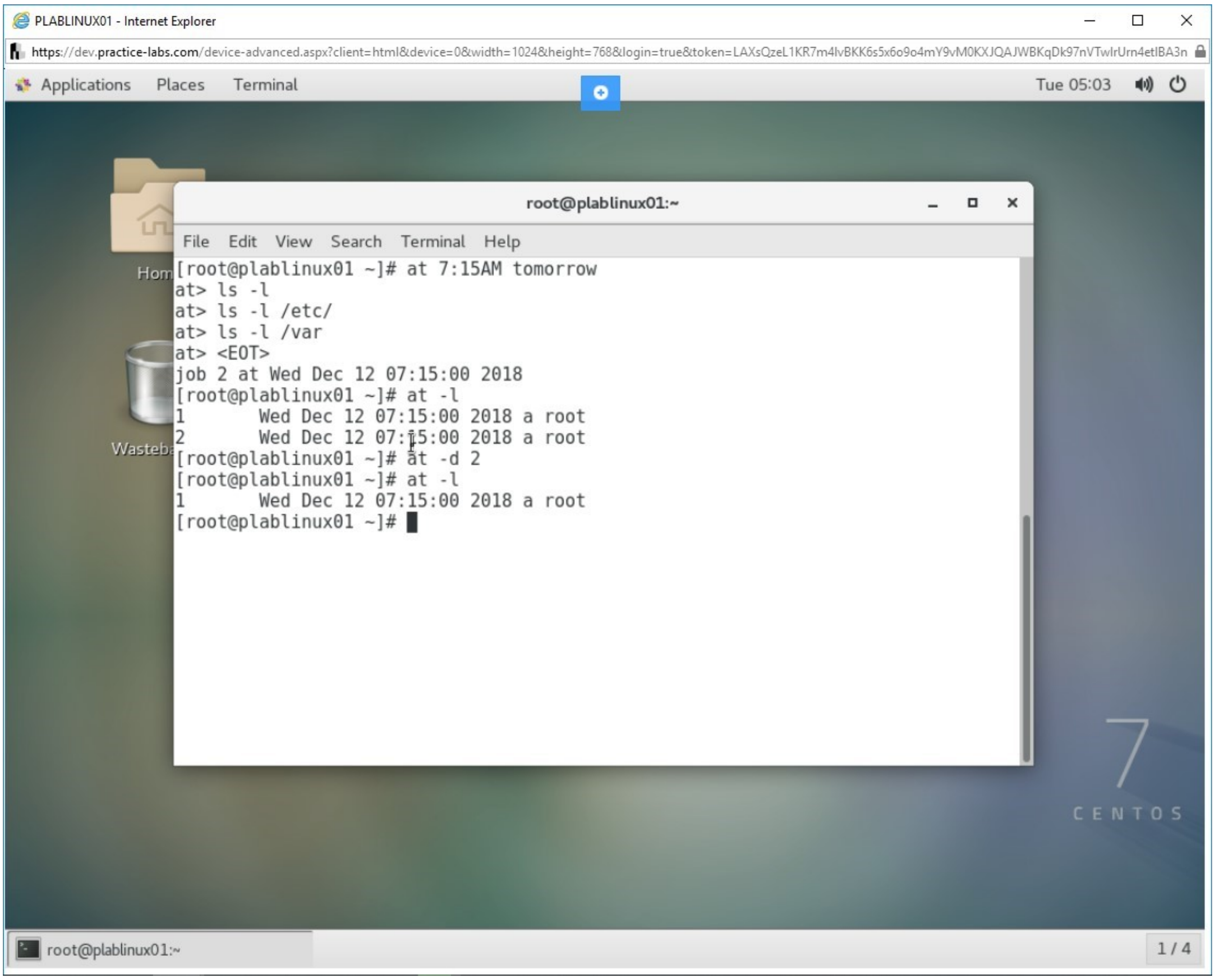
Step 13

To verify whether the job is still in the queue, type the following command:

```
at -l
```

Press **Enter**.

Note that there is one job in the queue.



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Applications
Places
Terminal
Tue 05:03
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# at 7:15AM tomorrow
at> ls -l
at> ls -l /etc/
at> ls -l /var
at> <EOT>
job 2 at Wed Dec 12 07:15:00 2018
[root@plablinux01 ~]# at -l
1       Wed Dec 12 07:15:00 2018 a root
2       Wed Dec 12 07:15:00 2018 a root
[root@plablinux01 ~]# at -d 2
[root@plablinux01 ~]# at -l
1       Wed Dec 12 07:15:00 2018 a root
[root@plablinux01 ~]#
```

Figure 1.13 Screenshot of PLABLINUX01: Verifying whether the job is still in the queue.

Step 14

The **atq** command is similar to the **at -l** command. You can use it to verify the jobs in the queue.

> ***Note***: *Before executing the **atq** command, create a new job using the **at** command.*

Clear the screen by entering the following command:

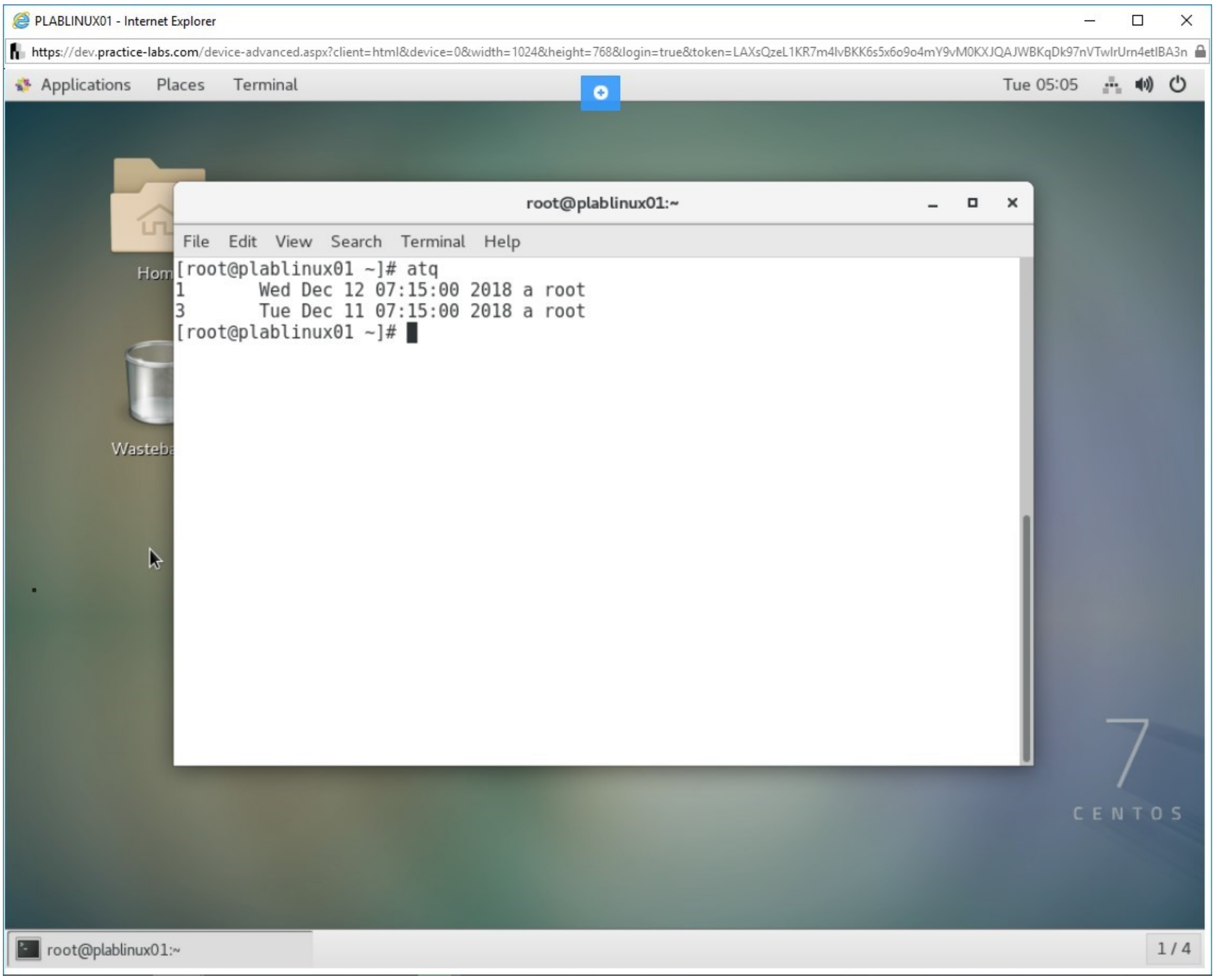
```
clear
```

To verify the jobs in the queue, type the following command:

```
atq
```

Press **Enter**.

Note that the job number of the new job created is incremented by 1. In this task, the earlier job number was 1 which is now incremented to 2.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:05
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# atq
1       Wed Dec 12 07:15:00 2018 a root
3       Tue Dec 11 07:15:00 2018 a root
[root@plablinux01 ~]# 
```

Figure 1.14 Screenshot of PLABLINUX01: Verifying the jobs in the queue with the atq command.

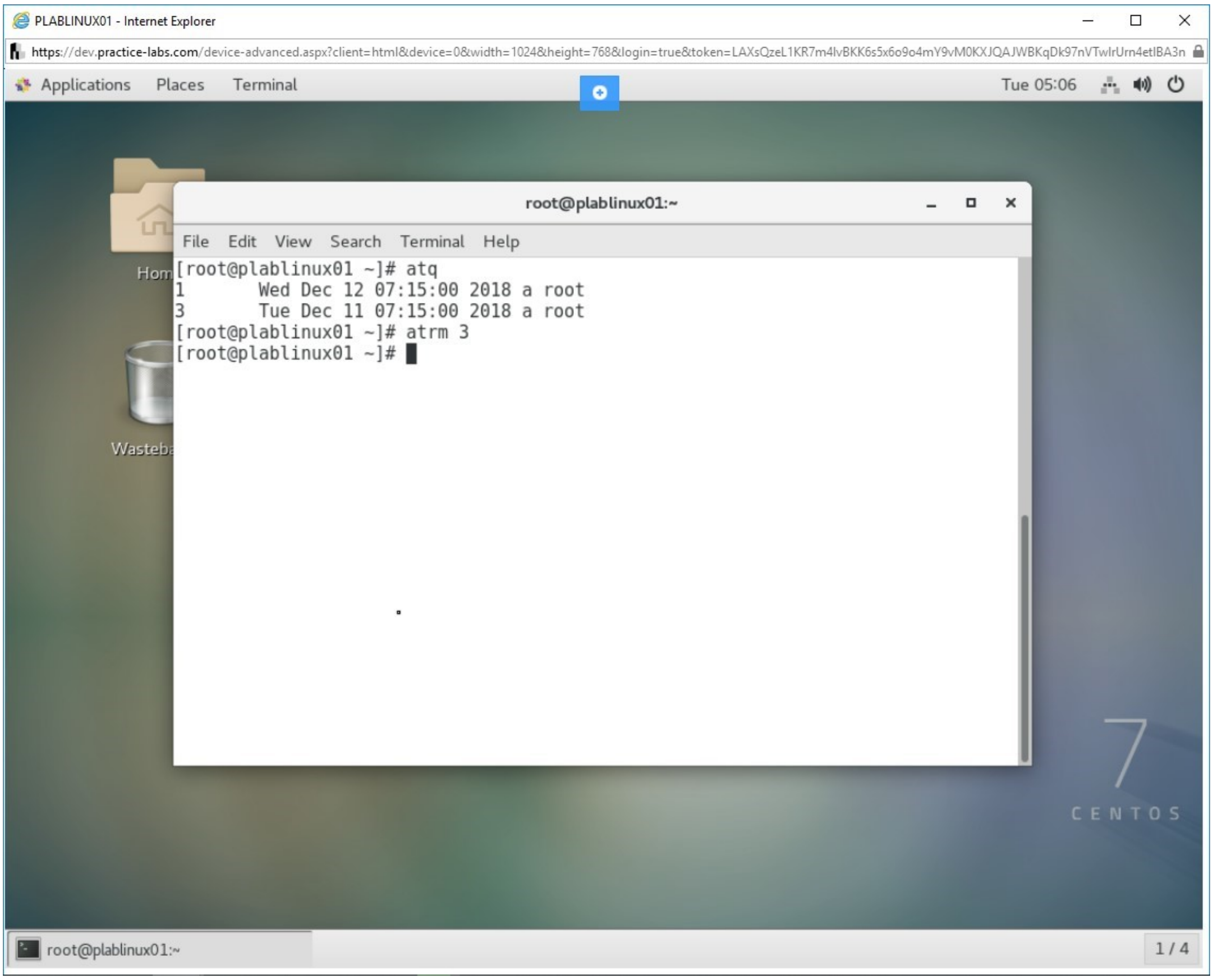
Step 15

Similar to the **at -d** command, you can use the **atrm** to remove a job from the queue.

To remove a job, type the following command:

```
atrm 3
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:06
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# atq
1       Wed Dec 12 07:15:00 2018 a root
3       Tue Dec 11 07:15:00 2018 a root
[root@plablinux01 ~]# atrm 3
[root@plablinux01 ~]# 
```

Figure 1.15 Screenshot of PLABLINUX01: Removing a job from the queue from the atrm command.

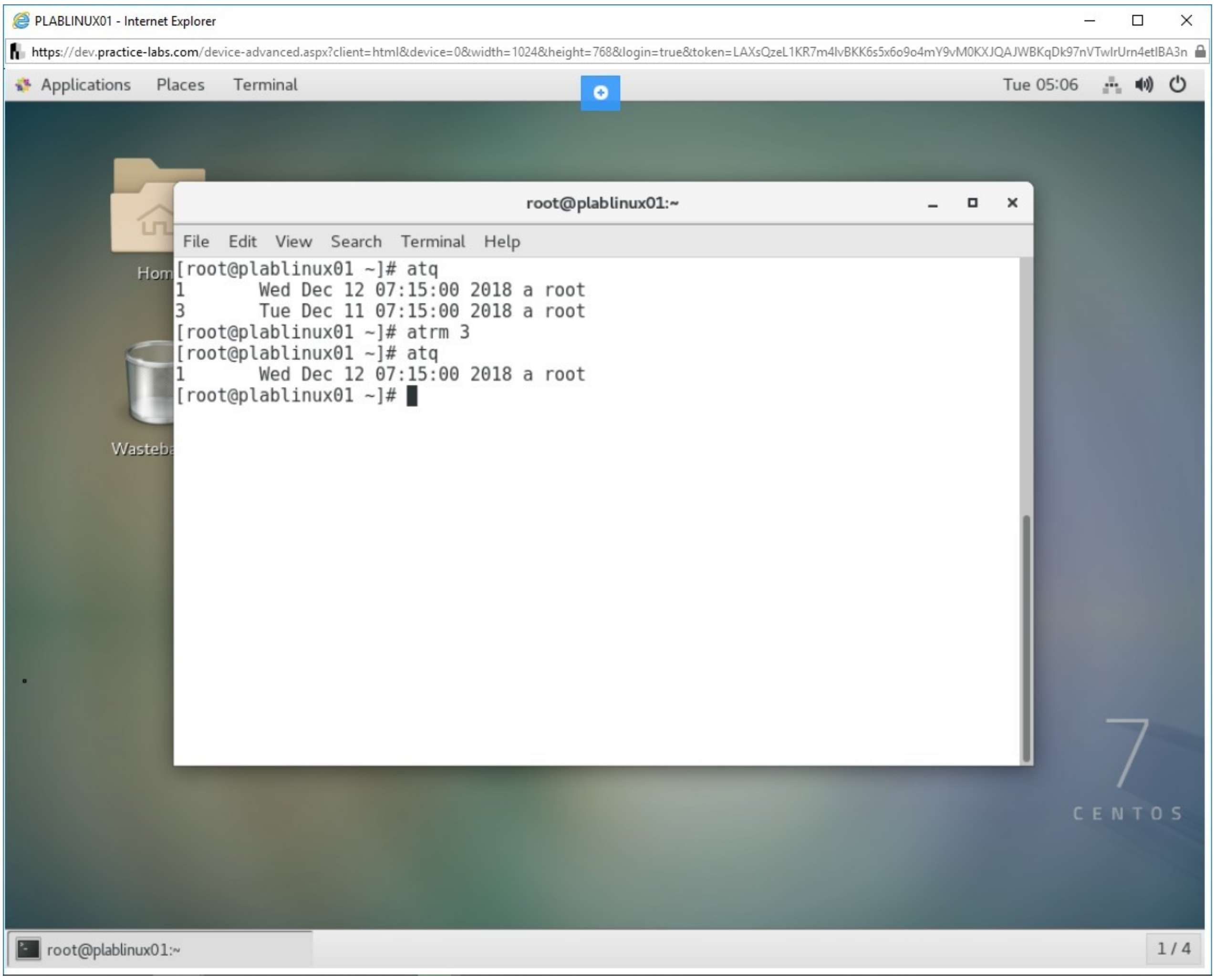
Step 16

To verify whether the job exists in the queue, type the following command:

```
atq
```

Press **Enter**.

The job **3** is now deleted.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:06
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# atq
1       Wed Dec 12 07:15:00 2018 a root
3       Tue Dec 11 07:15:00 2018 a root
[root@plablinux01 ~]# atrm 3
[root@plablinux01 ~]# atq
1       Wed Dec 12 07:15:00 2018 a root
[root@plablinux01 ~]# 
```

Figure 1.16 Screenshot of PLABLINUX01: Verifying the jobs in the queue with the atq command.

Task 2 - Configure User Access to cron and at Services

You can control the access to the **cron** or **at** commands using the **cron.allow**, **cron.deny**, **at.allow**, or **at.deny** files. The **.allow** file takes precedence over the **.deny** file.

All these files must be located in the **/etc/** directory. It is not necessary that these files pre-exist in the **/etc/** directory. If they do not exist, you can create them. It is important to note that if the **cron.allow** or **at.allow** files do not exist, any user NOT listed in the **cron.deny** or **at.deny** file will be allowed to run the **cron** or **at** jobs, without needing any specific permission to access these services.

To configure user access to **cron** and **at** services, perform the following steps:

Step 1

Clear the screen by entering the following command:

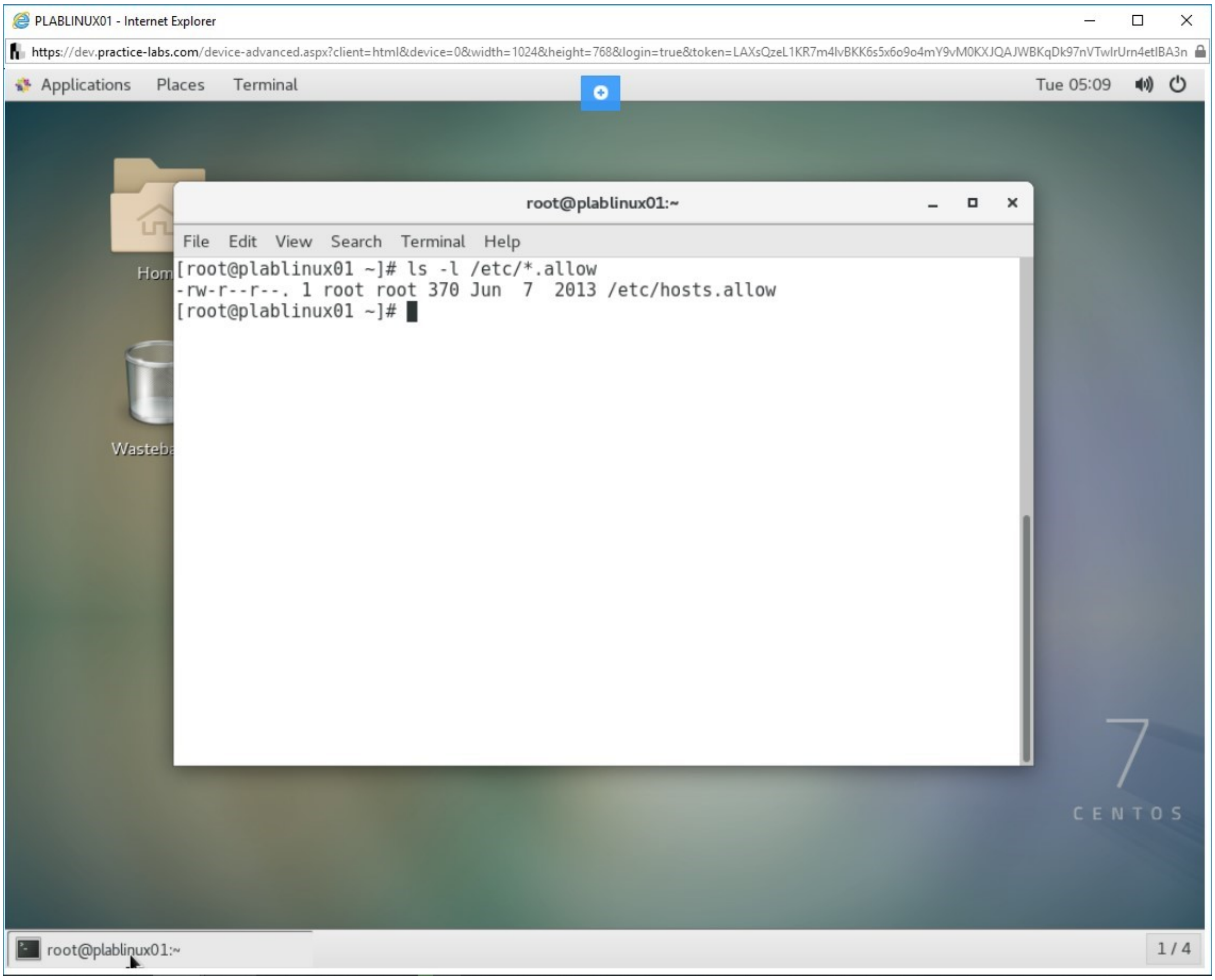
```
clear
```

To list the **.allow** files in the **/etc/** directory, type the following command:

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

Press **Enter**.

Note that there is no **cron.allow** or **at.allow** file.



```
[root@plablinux01 ~]# ls -l /etc/*.allow
-rw-r--r--. 1 root root 370 Jun  7  2013 /etc/hosts.allow
[root@plablinux01 ~]# 
```

PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:09
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Hom
Wasteb
7
CENTOS
root@plablinux01:~
1 / 4

Figure 1.17 Screenshot of PLABLINUX01: Listing the .allow files in the /etc/ directory.

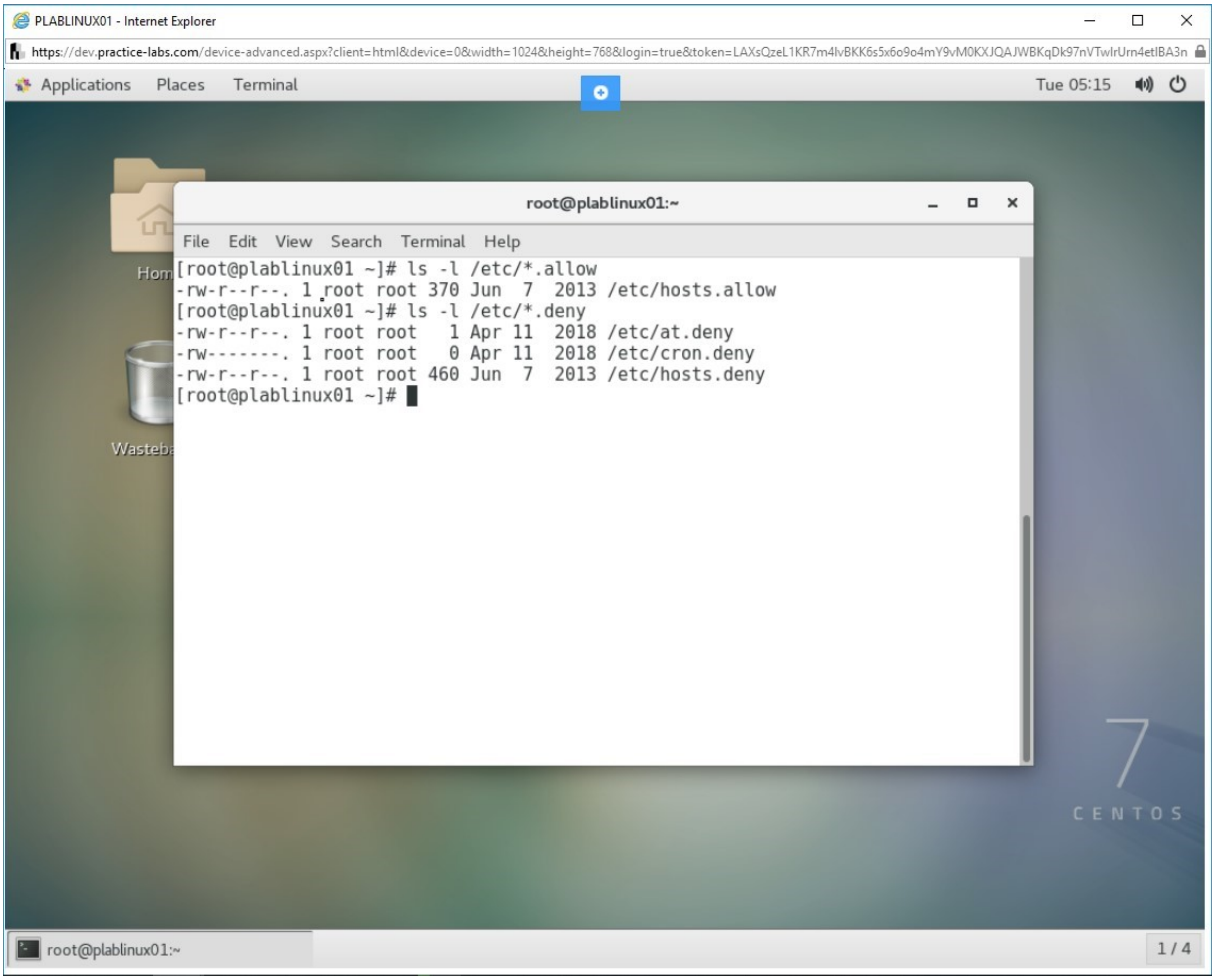
Step 2

To check whether **cron.deny** or **at.deny** files exist in the **/etc/** directory, type the following command:

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

Press **Enter**.

Note that both the **at.deny** and **cron.deny** files exist.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:15
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Hom
Wasteb
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -l /etc/*.allow
-rw-r--r--. 1 root root 370 Jun  7  2013 /etc/hosts.allow
[root@plablinux01 ~]# ls -l /etc/*.deny
-rw-r--r--. 1 root root   1 Apr 11  2018 /etc/at.deny
-rw-------. 1 root root   0 Apr 11  2018 /etc/cron.deny
-rw-r--r--. 1 root root 460 Jun  7  2013 /etc/hosts.deny
[root@plablinux01 ~]# 
```

Figure 1.18 Screenshot of PLABLINUX01: Listing the .deny files in the /etc/ directory.

Step 3

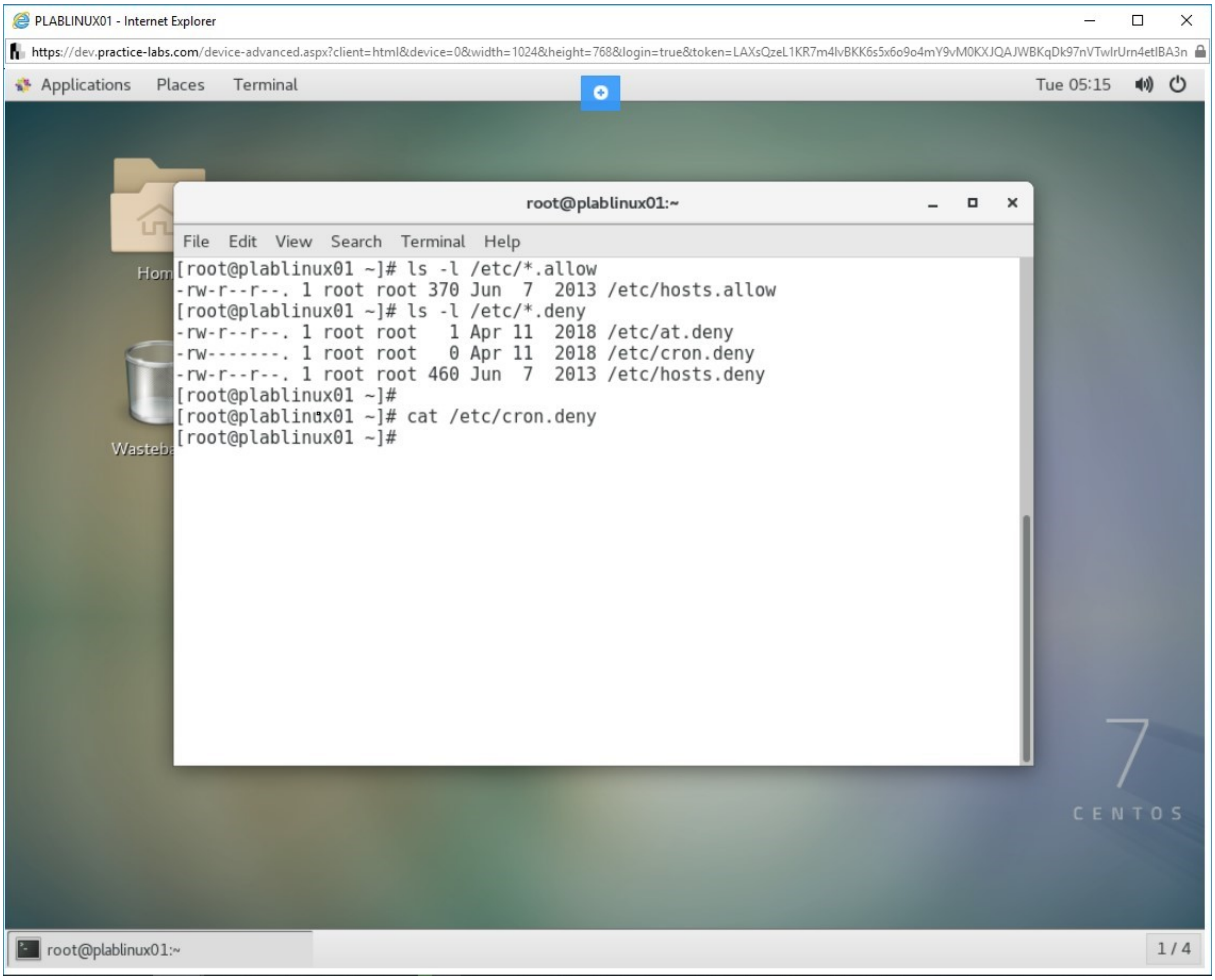
To view the users listed in the **cron.deny** file, type the following command:

```
cat /etc/cron.deny
```

Press **Enter**.

There are no users listed in this file.

> ***Note**: You can edit this file and add usernames. Each user name must appear on a separate line, and no whitespaces are allowed. The root user can still access both **cron** and **at** services even if the root user is added to the **cron.deny** or **at.deny** files.*


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:15
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Hom
Wasteb
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -l /etc/*.allow
-rw-r--r--. 1 root root 370 Jun  7  2013 /etc/hosts.allow
[root@plablinux01 ~]# ls -l /etc/*.deny
-rw-r--r--. 1 root root   1 Apr 11  2018 /etc/at.deny
-rw-------. 1 root root   0 Apr 11  2018 /etc/cron.deny
-rw-r--r--. 1 root root 460 Jun  7  2013 /etc/hosts.deny
[root@plablinux01 ~]#
[root@plablinux01 ~]# cat /etc/cron.deny
[root@plablinux01 ~]#
```

Figure 1.19 Screenshot of PLABLINUX01: Viewing the users listed in the cron.deny file.

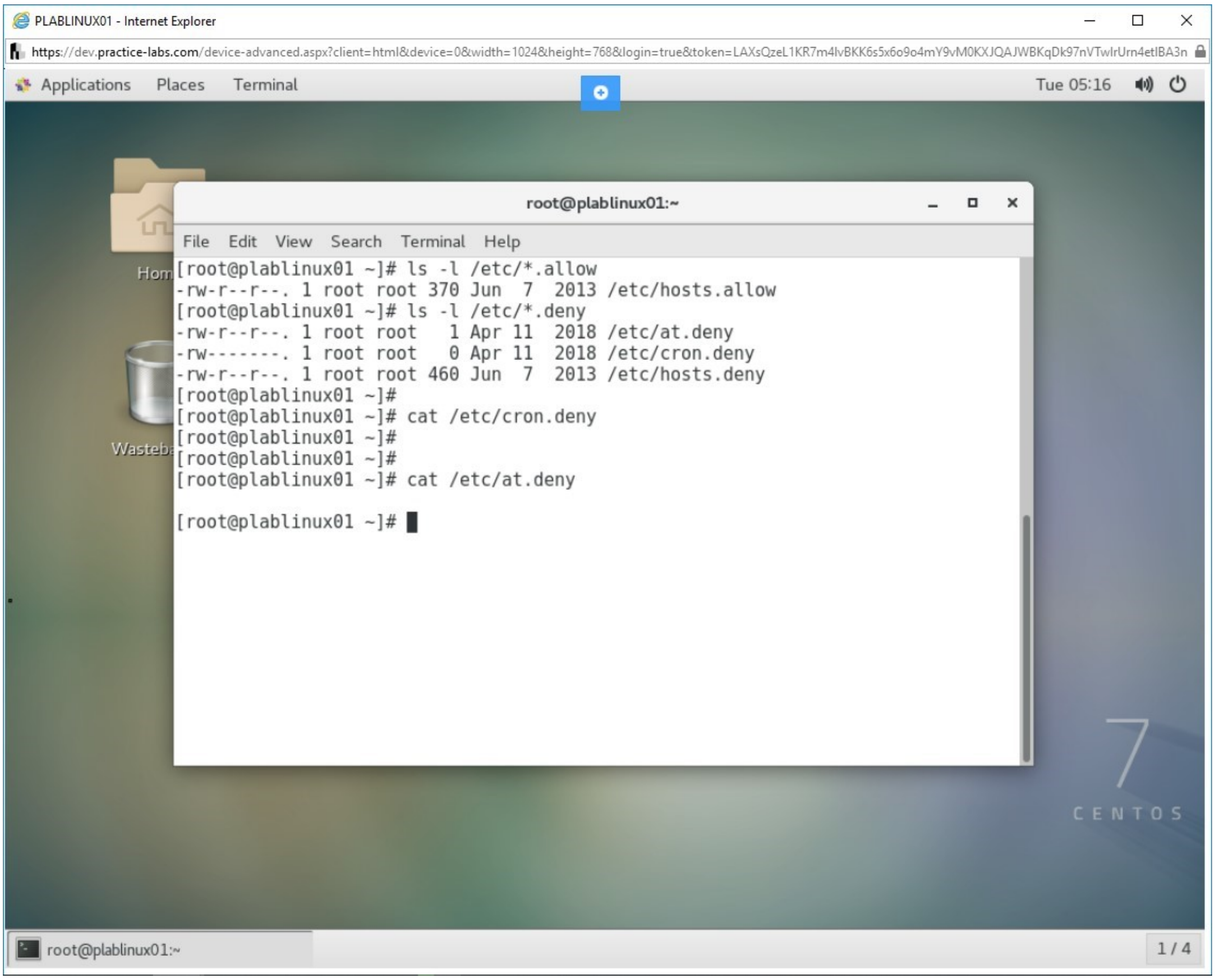
Step 4

To view the users in the **at.deny** file, type the following command:

```
cat /etc/at.deny
```

Press **Enter**.

Notice that no users are listed in the **at.deny** file.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:16
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -l /etc/*.allow
-rw-r--r--. 1 root root 370 Jun  7  2013 /etc/hosts.allow
[root@plablinux01 ~]# ls -l /etc/*.deny
-rw-r--r--. 1 root root   1 Apr 11  2018 /etc/at.deny
-rw-------. 1 root root   0 Apr 11  2018 /etc/cron.deny
-rw-r--r--. 1 root root 460 Jun  7  2013 /etc/hosts.deny
[root@plablinux01 ~]#
[root@plablinux01 ~]# cat /etc/cron.deny
[root@plablinux01 ~]#
[root@plablinux01 ~]#
[root@plablinux01 ~]# cat /etc/at.deny

[root@plablinux01 ~]# 
```

Figure 1.20 Screenshot of PLABLINUX01: Viewing the users in the at.deny file.

Task 3 - Configure anacron

The **anacron** daemon works just like **cron**. However, one key difference is that **cron** expects the system to be up around the clock and run the jobs. Therefore, it runs the scheduled jobs only at the scheduled time. On the other hand, the **anacron** daemon runs the job at a scheduled time, but if the system is not up and running at the scheduled time, the anacron daemon holds up the job and runs the job as soon as the system is up. For example, if you have a script that runs at 5 AM in the morning but at this time your system is off. The **anacron** daemon will run the job when you switch on your system at 9 AM. The **cron** daemon will wait for the next day to execute the script at 5 AM.

To configure **anacron**, perform the following steps:

Step 1

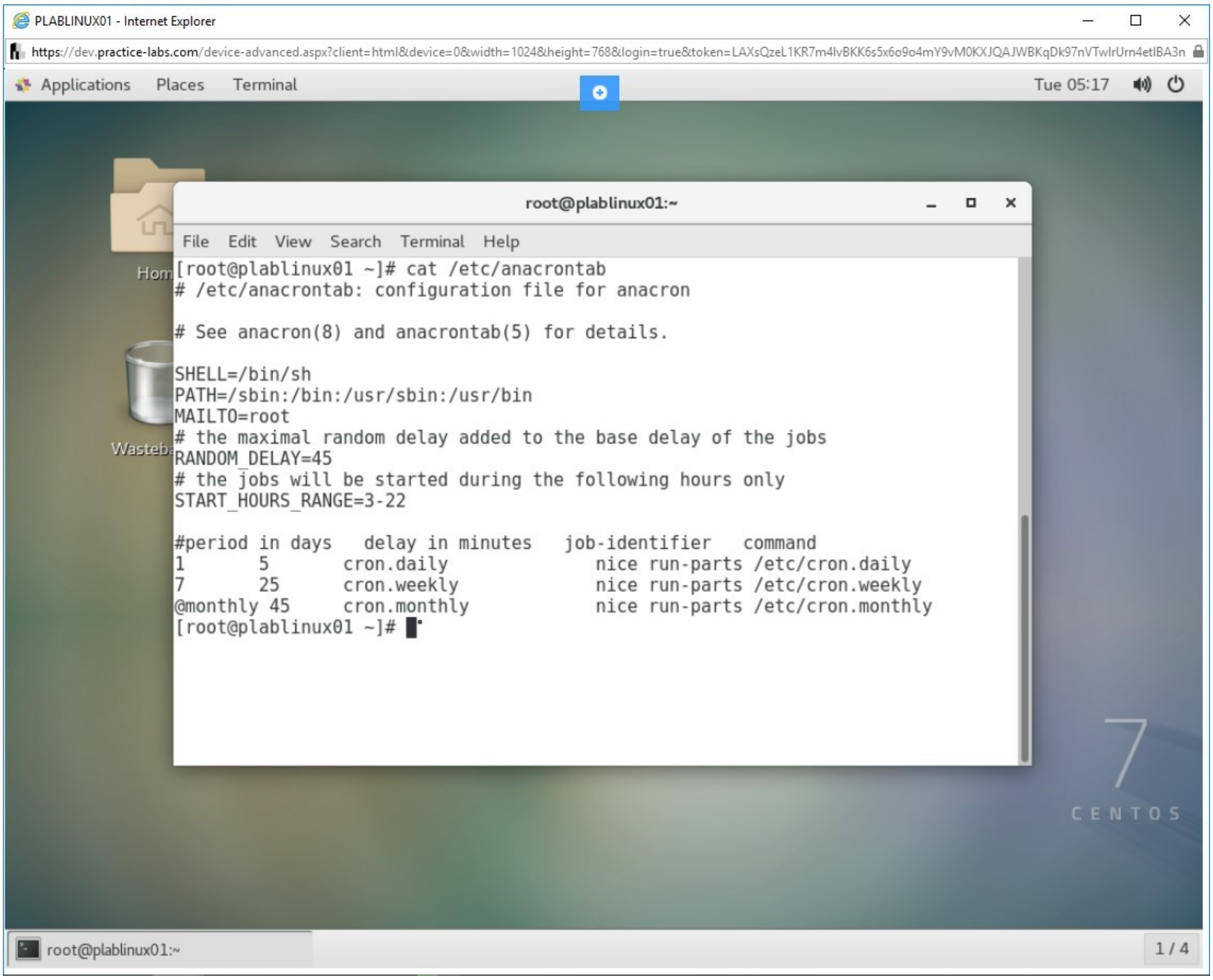
Clear the screen by entering the following command:

```
clear
```

Just like the **/etc/crontab** file, **anacron** also has **/etc/anacrontab** file. To view the **/etc/anacrontab** file, type the following commands:

```
cat /etc/anacrontab
```

Press **Enter**.



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:17
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# cat /etc/anacrontab
# /etc/anacrontab: configuration file for anacron

# See anacron(8) and anacrontab(5) for details.

SHELL=/bin/sh
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root
# the maximal random delay added to the base delay of the jobs
RANDOM_DELAY=45
# the jobs will be started during the following hours only
START_HOURS_RANGE=3-22

#period in days   delay in minutes   job-identifier   command
1       5       cron.daily              nice run-parts /etc/cron.daily
7       25      cron.weekly             nice run-parts /etc/cron.weekly
@monthly 45     cron.monthly            nice run-parts /etc/cron.monthly
[root@plablinux01 ~]# 
```

Figure 1.21 Screenshot of PLABLINUX01: Viewing the /etc/anacrontab file.

Step 2

Clear the screen by entering the following command:

```
clear
```

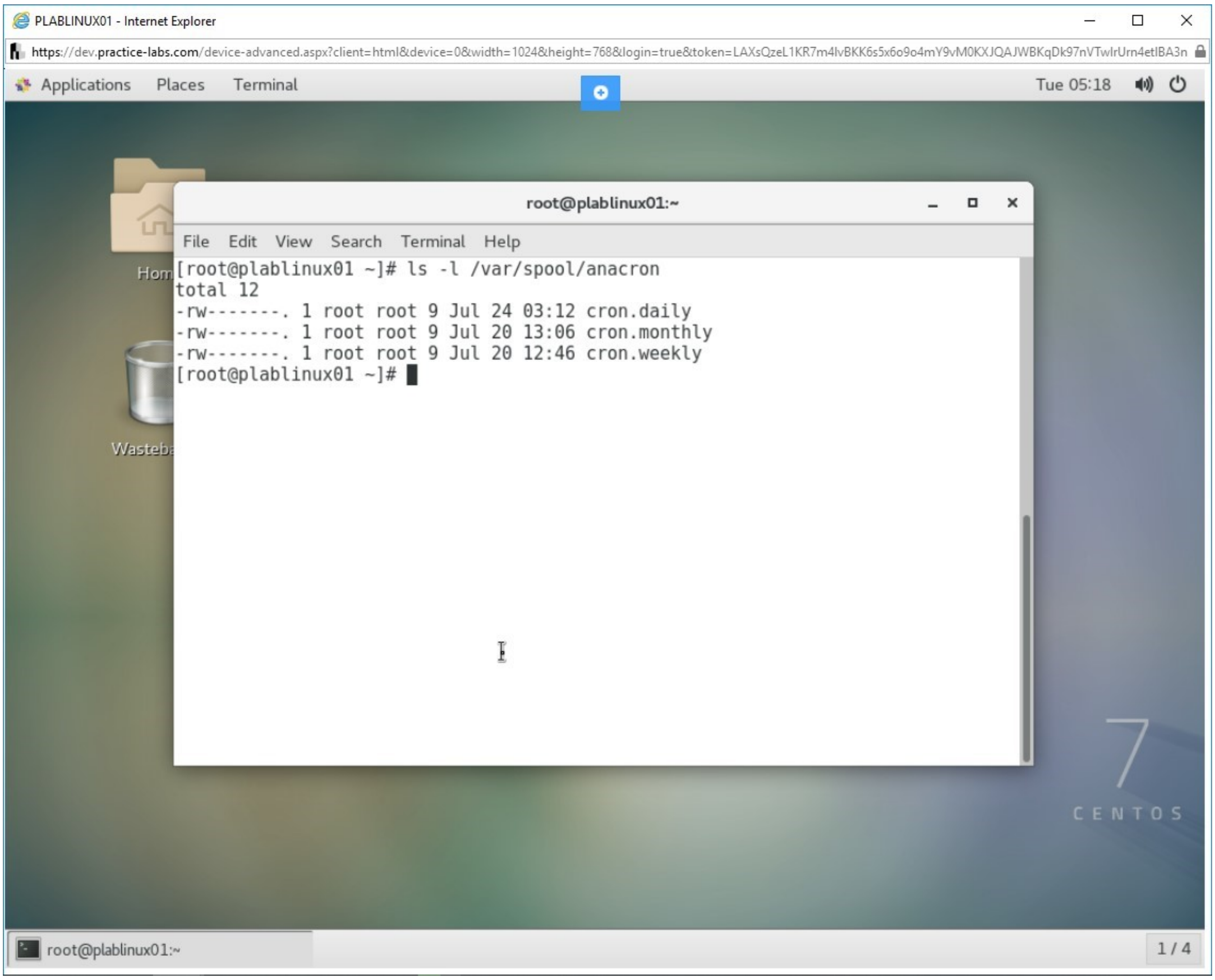
The **/var/spool/anacron** directory contains the following files:

- cron.daily
- cron.monthly
- cron.weekly

To view the **/var/spool/anacron** directory, type the following command:

```
ls -l /var/spool/anacron
```

Press **Enter**.


PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:18
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# ls -l /var/spool/anacron
total 12
-rw-------. 1 root root 9 Jul 24 03:12 cron.daily
-rw-------. 1 root root 9 Jul 20 13:06 cron.monthly
-rw-------. 1 root root 9 Jul 20 12:46 cron.weekly
[root@plablinux01 ~]#
```

Figure 1.22 Screenshot of PLABLINUX01: Viewing the /var/spool/anacron directory.

Step 3

Clear the screen by entering the following command:

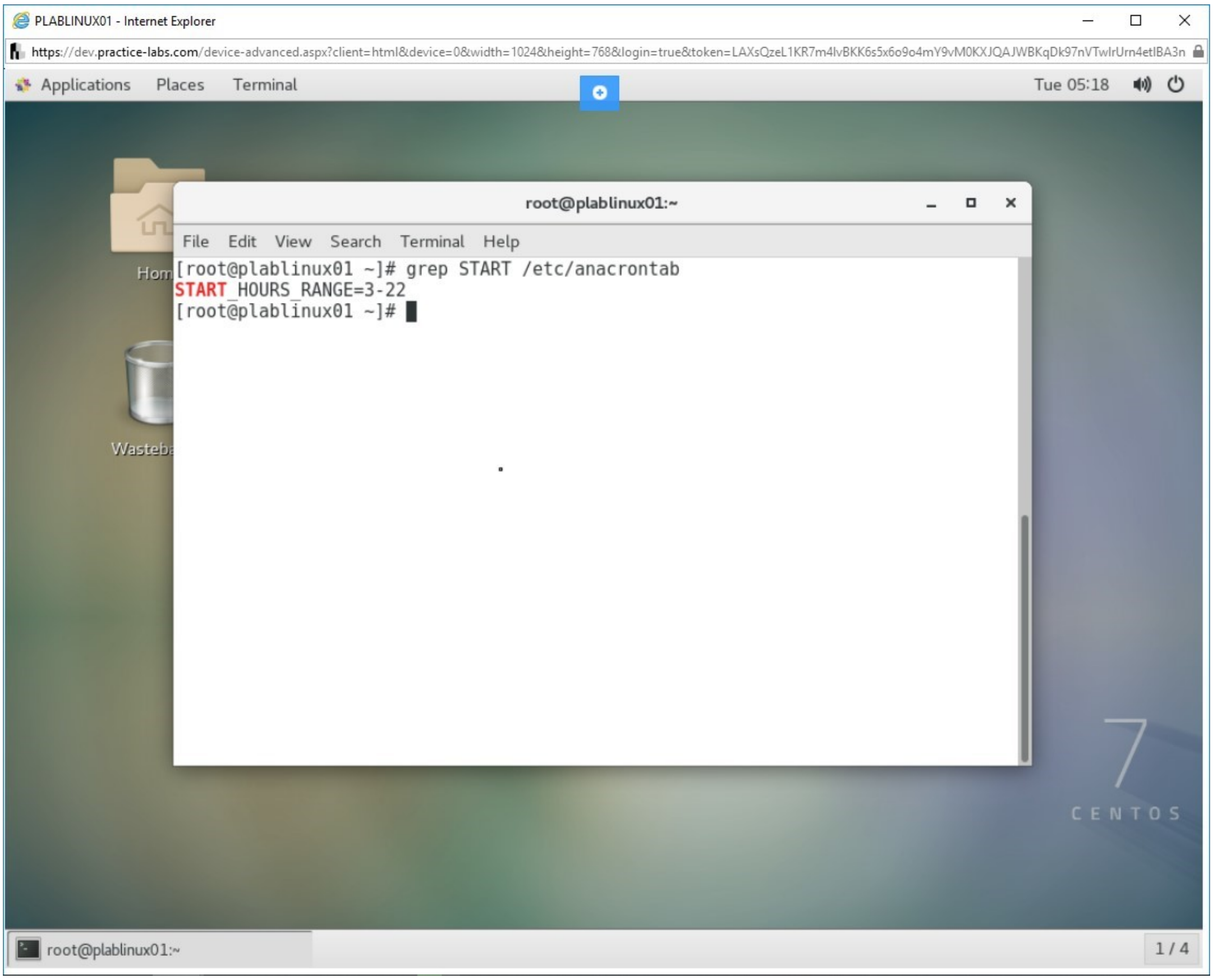
```
clear
```

To view only the **START_HOURS_RANGE** environment variable in the **/etc/anacrontab** file, type the following command:

```
grep START /etc/anacrontab
```

Press **Enter**.

***Note**: The default range is 3-22, which is 3 AM to 10 PM.*



PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etlBA3n
Applications
Places
Terminal
Tue 05:18
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
Home
Wastebasket
7
CENTOS
root@plablinux01:~
1 / 4

```
[root@plablinux01 ~]# grep START /etc/anacrontab
START_HOURS_RANGE=3-22
[root@plablinux01 ~]#
```

Figure 1.23 Screenshot of PLABLINUX01: Viewing only the START_HOURS_RANGE environment variable in the /etc/anacrontab file.

Step 4

Clear the screen by entering the following command:

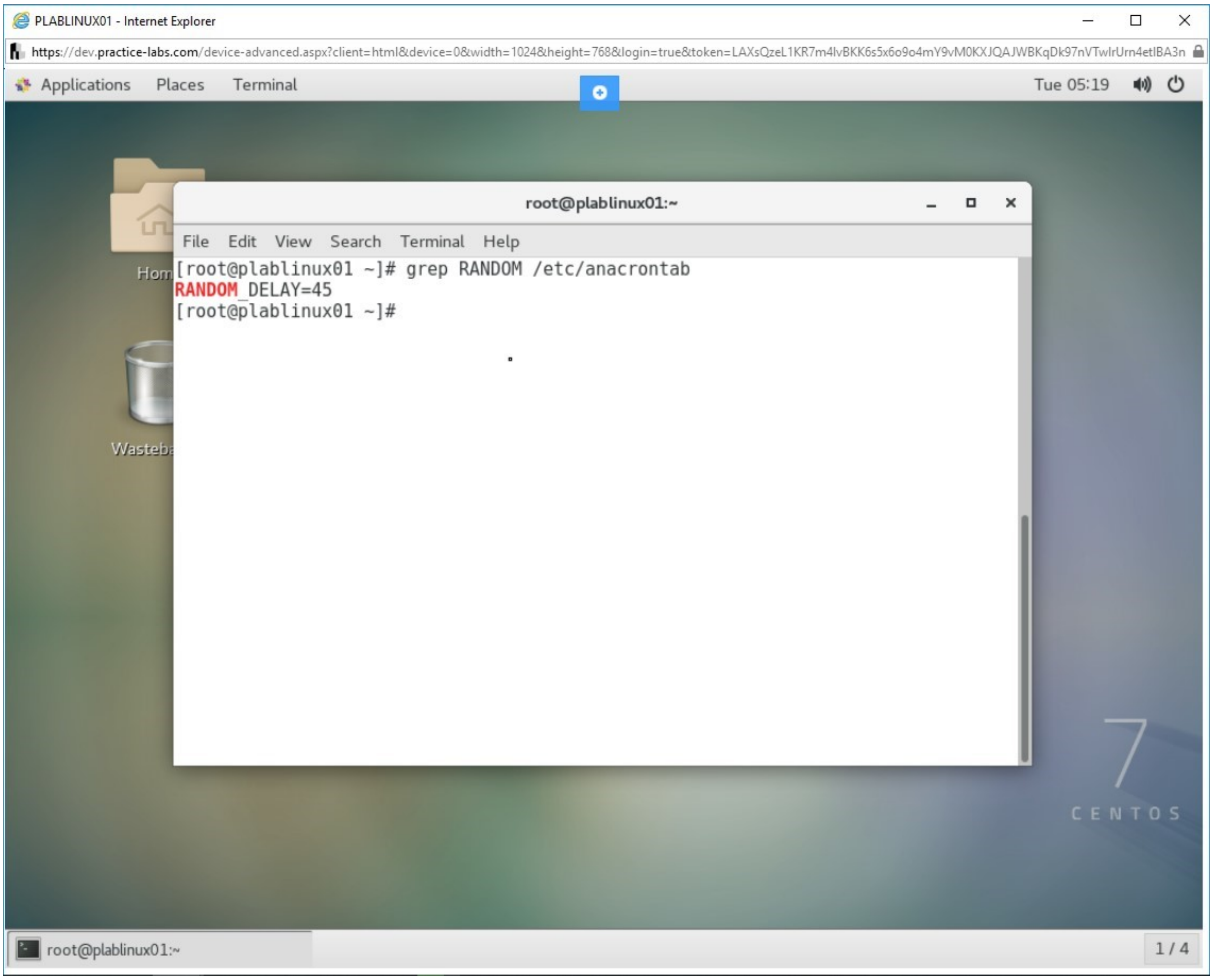
```
clear
```

anacron also adds a random delay to the user-specified delay. To view the random delay, type the following command:

```
grep RANDOM /etc/anacrontab
```

Press **Enter**.

Notice that the specified random delay is 45 minutes.



```
[root@plablinux01 ~]# grep RANDOM /etc/anacrontab
RANDOM_DELAY=45
[root@plablinux01 ~]#
```

PLABLINUX01 - Internet Explorer
https://dev.practice-labs.com/device-advanced.aspx?client=html&device=0&width=1024&height=768&login=true&token=LAXsQzeL1KR7m4lvBKK6s5x6o9o4mY9vM0KXJQAJWBKqDk97nVTwlrUrn4etIBA3n
Applications
Places
Terminal
Tue 05:19
root@plablinux01:~
File
Edit
View
Search
Terminal
Help
7
CENTOS
root@plablinux01:~
1 / 4

Figure 1.24 Screenshot of PLABLINUX01: Viewing the random delay in the /etc/anacrontab file.

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

Review

Well done, you have completed the **Automate System Administration Tasks by Scheduling Jobs** Practice Lab.

Summary

You completed the following exercise:

- Exercise 1 - Automate System Administration Tasks by Scheduling Jobs

You should now be able to:

- Manage cron and at jobs
- Configure user access to cron and at services
- Configure anacron

Feedback

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