Date: August-26th-2025

PRACTICE LAB 1
&
TROUBLESHOOTING

PRESENTATION: Welcome to NIT

"Smallness of means, greatness of purpose and Astounding Results"

1

PING Command
NIT ACADEMY

Date: August-26th-2025

In this tutorial, we will all about how to use the ping command

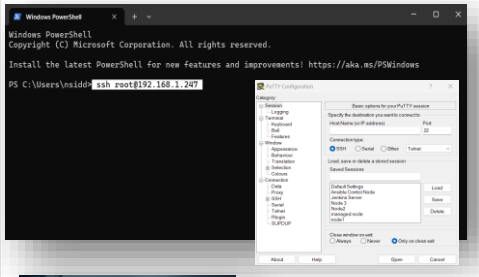
- Ping stands for **Packet Internet Groper**. A software application, utility or tool used to test and diagnose connectivity-related issues on a network
- Ping is based on **ICMP** protocol
- System Admins use it test if a remote server is reachable

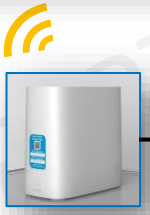
PRACTICE LAB 1 - PING

Nexus Office

NOTE: All of these locations are REMOTE LOCATIONS

HOME





VPN, Tunnel, OpenVPN

DATA CENTER "on-prem"

CISCO ROUTER

Arista Switch

SSH

worker-P01 Server

Labnit0001-PROD-1.academy

From 1 we will PING 2

Client — Server

Ping Resolution Flow Diagram

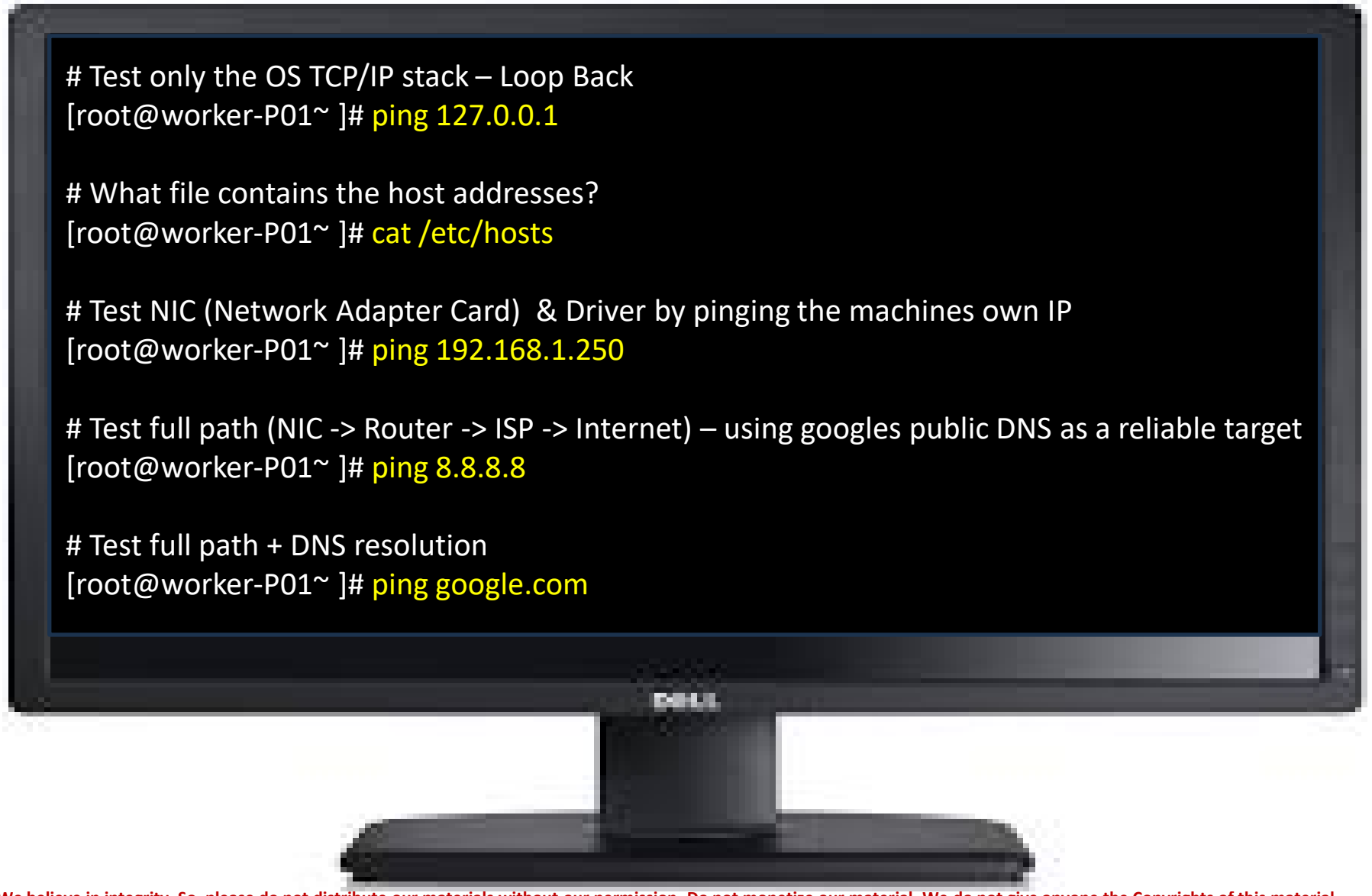
Date: Aug-17th-2025

- **ping localhost (127.0.0.1 / ::1):** Tests only the OS TCP/IP stack via loopback **(green).**
- **ping <machine_IP>:** Adds test of NIC hardware & driver **(blue).**
- **ping 8.8.8.8**: Full path test: NIC → Router → ISP → Internet (red).
- **ping google.com**: Adds DNS resolution to full path **(purple).**

Command	What it Tests	What it Confirms	What it Does **NOT** Test
ping localhost (127.0.0.1 or ::1)	Loopback interface + local IP stack **inside the kernel**	✔ TCP/IP stack is up ✔ ICMP works locally ✔ OS networking is functional	❌ Physical NIC ❌ Router ❌ Internet connectivity
ping <machine_IP> (e.g. 192.168.1.250)	Local NIC + driver + OS network stack	✔ NIC card is working ✔ OS can talk through its own interface ✔ IP assigned correctly	❌ Router connectivity ❌ Internet access
ping 8.8.8.8 (Google DNS)	End-to-end connectivity	✔ Local NIC works ✔ Router/gateway works ✔ ISP path to Internet works	❌ DNS resolution (since IP is given directly)
ping google.com	End-to-end + DNS resolution	✔ Local NIC works ✔ Router/ISP path works ✔ Internet reachable ✔ DNS is working	❌ Nothing major — this is the *full test*

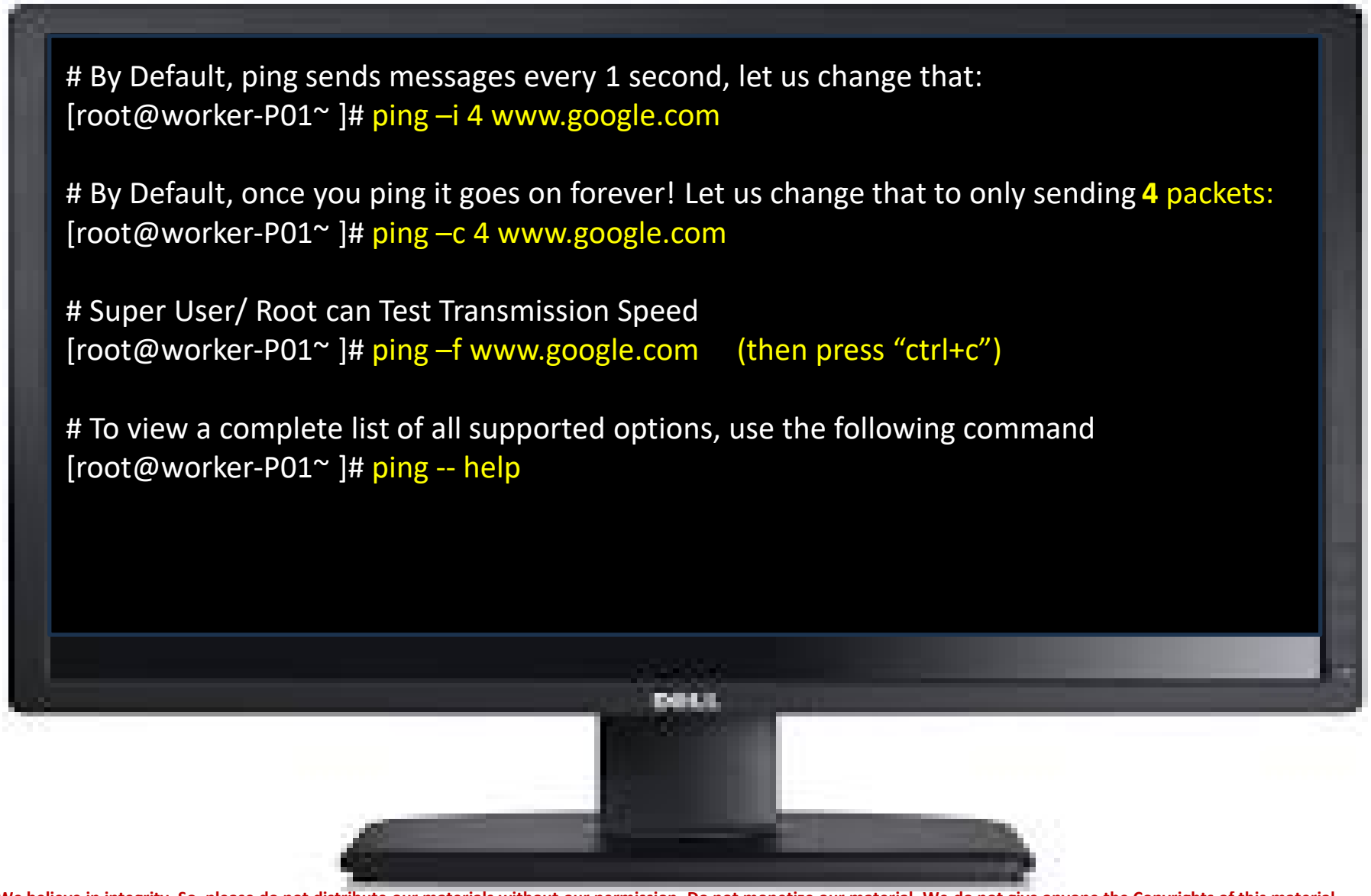
PRACTICE LAB

Date: August-26th-2025



PRACTICE LAB

Date: August-26th-2025



2

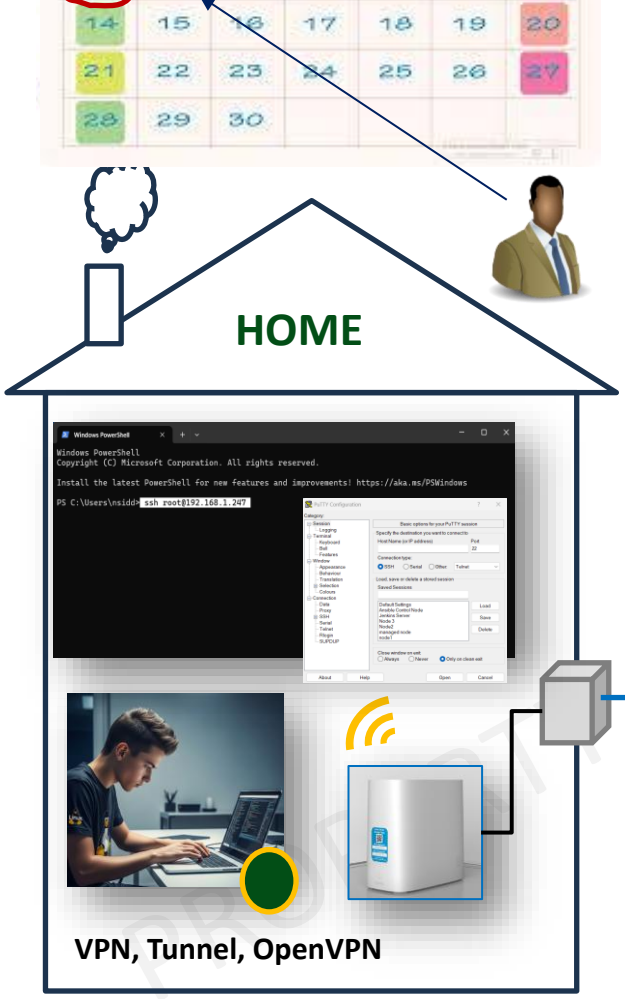
DATE / UPTIME / HOSTNAME / HOST IP
NIT ACADEMY

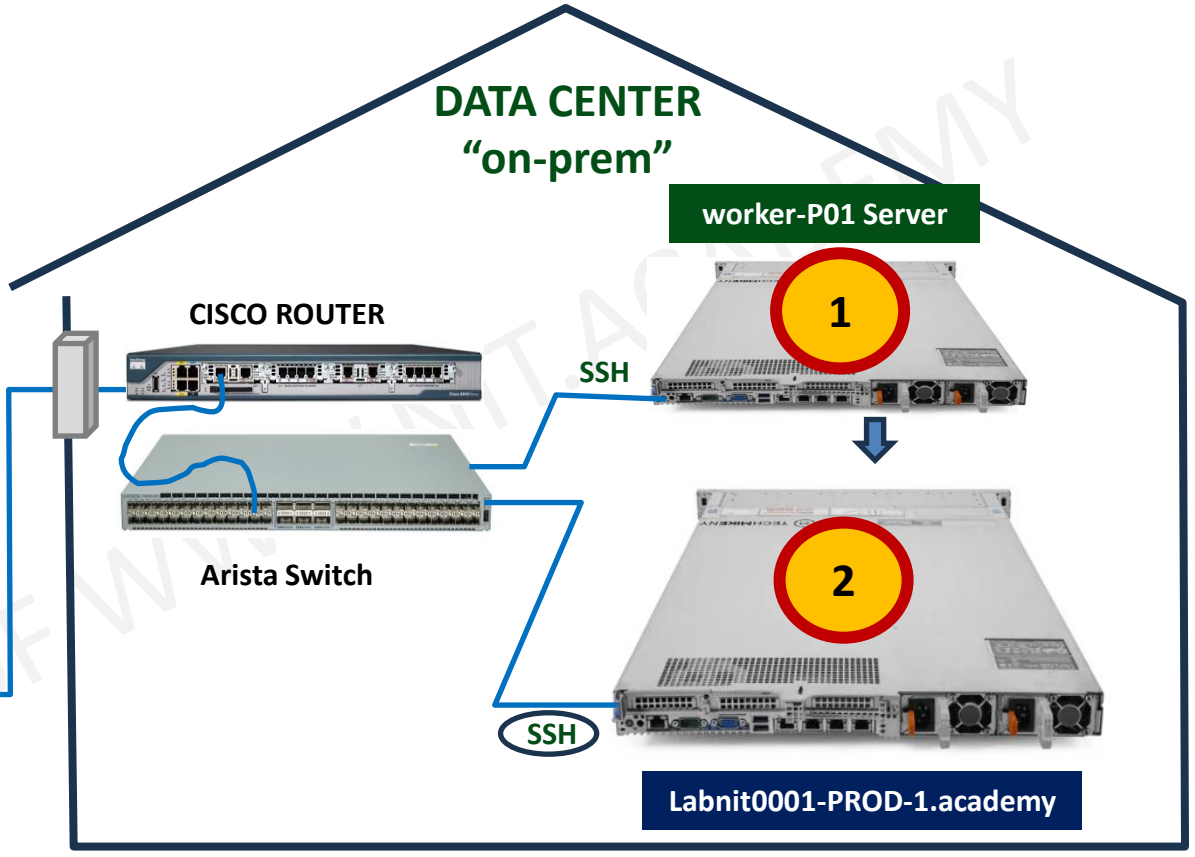
Date: August-26th-2025

- Date validates or work.
- Uptime is part of the the TOP command
- Uptime tells the System Admin a lot of things
  - How long has the server been “running”?
  - Maybe SSH Services have failed?
  - Maybe httpd services are not running?
- Hostname and its IP also help us validate our work

PRACTICE LAB 2 - UPTIME

NOTE: All of these locations are REMOTE LOCATIONS



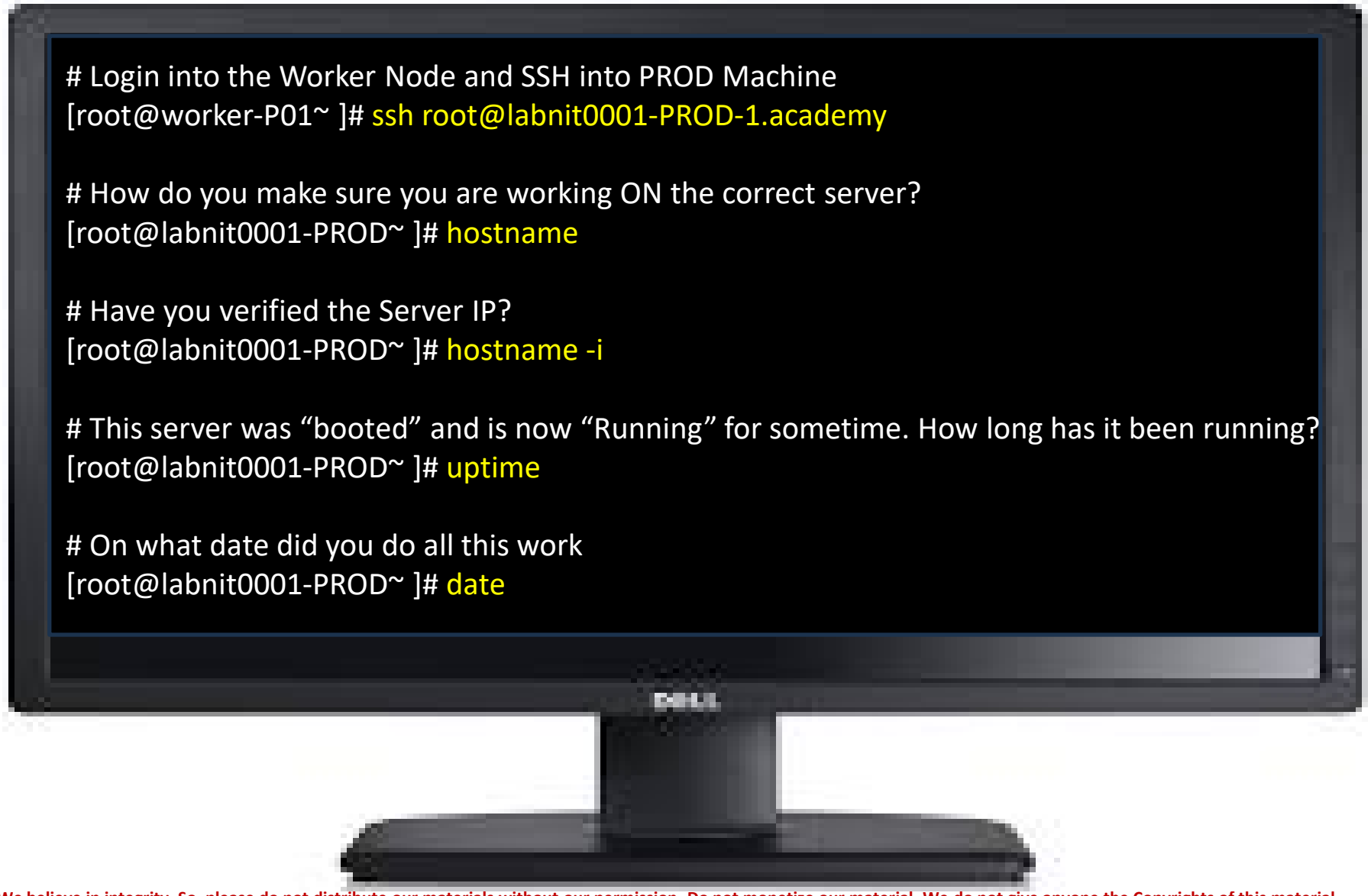


How Long has it been since this server was UP?

Client — 1 — 2 — Server

PRACTICE LAB

Date: July-26th-2025



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VALUABLE COMMANDS

Date: August-26th-2025

- You will be asked in an interview how do you check the kernel version?
- You will be asked in an interview how do you check the **number of CPU's**
- You will be asked in an interview how do you check **memory?**
- You will be asked in an interview how do you check **disk usage?**
- What is the difference between **"ip a"** and **"hostname –i"?**

Date: July-25th-2025

LINUX LINE COMMANDS

Binaries

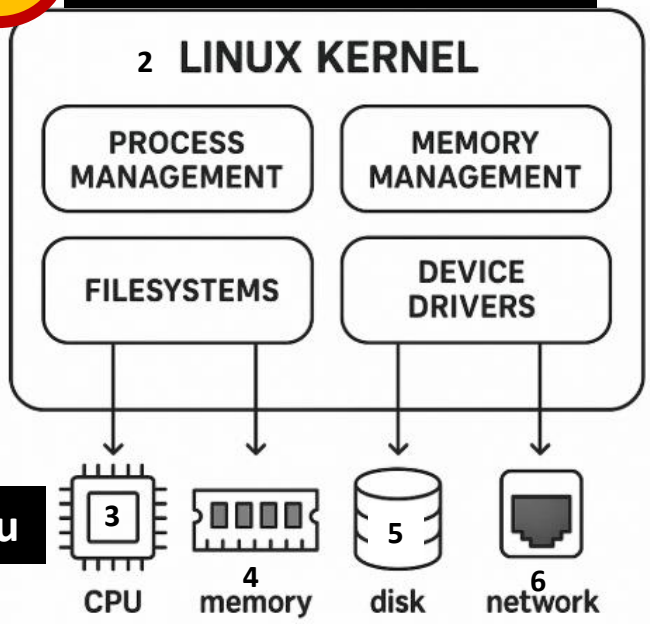
[root@vm1~]# pwd

7

1 [root@vm1~]#uname -a

```
oot@servera ~]# date
i Jul 25 05:05:53 AM CDT 2025
oot@servera ~]# hostname
rvera
oot@servera ~]# uptime
5:06:03 up 7 days, 19:32,  2 users,  load average: 0.00, 0.01, 0.0
oot@servera ~]# cal
     July 2025
 Mo Tu We Th Fr Sa
     1  2  3  4  5
  7  8  9 10 11 12
 14 15 16 17 18 19
 21 22 23 24 25 26
```

2 [root@vm1~]#uname -r



3 [root@vm1~]#lscpu

6

4 [root@vm1~]#free –m

[root@vm1~]#ip a

5 [root@vm1~]#df –h

PRACTICE LAB

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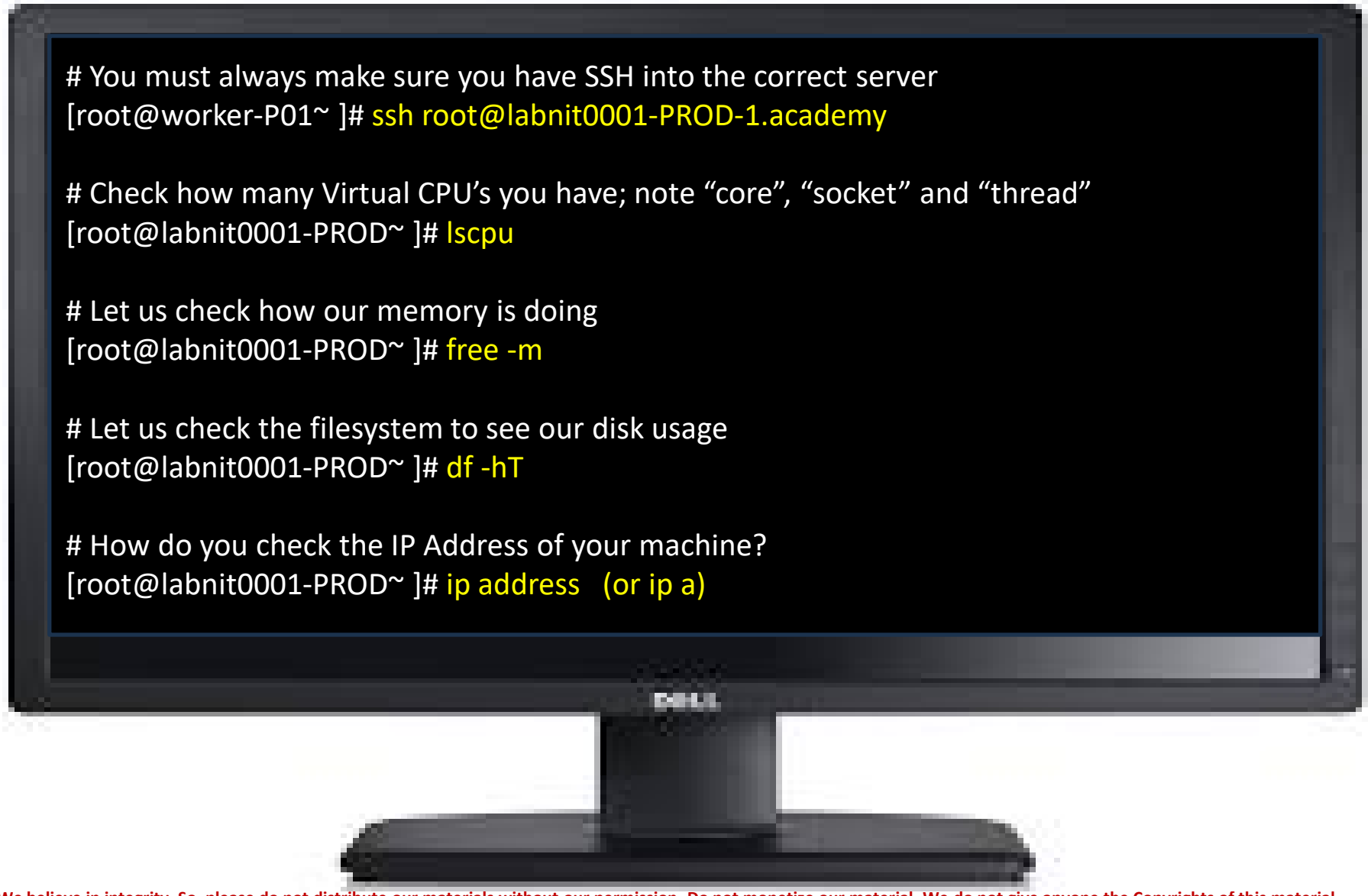

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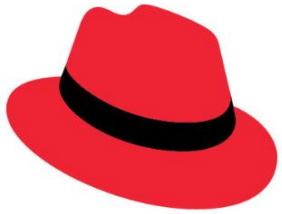


RHCSA EXAM QUESTIONS

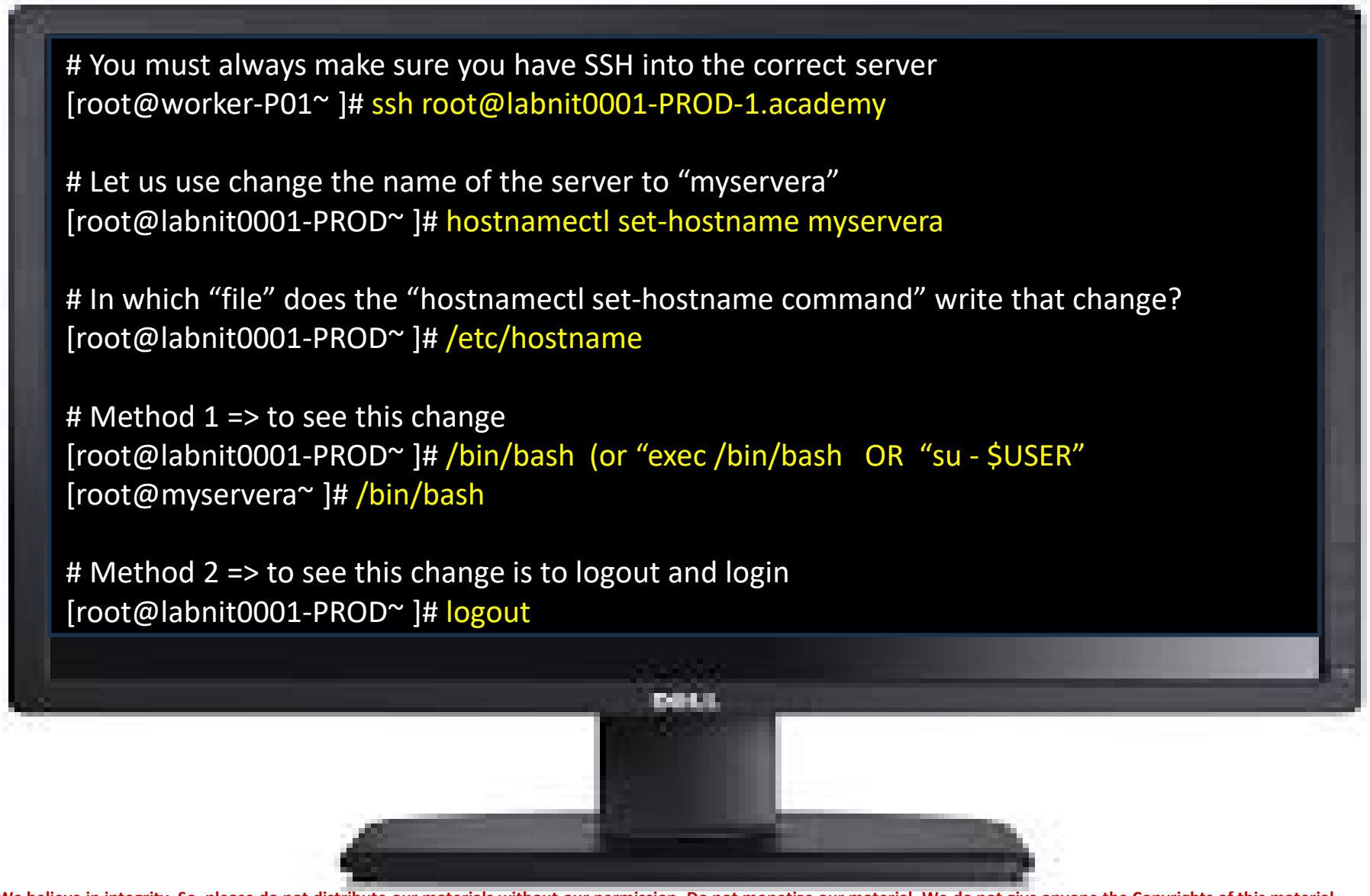
Date: August-26th-2025

- How do you set a new name of a host?
- How do you set static IP?
- How do you recover the password of a machine
- How do you create files?
- How do you create directories?
- How do you copy files with the Linux Filesystem
- How do you rename files?
- How do you delete files and directories?
- What is the difference between “cat” and “cd” commands

SETTING HOSTNAME

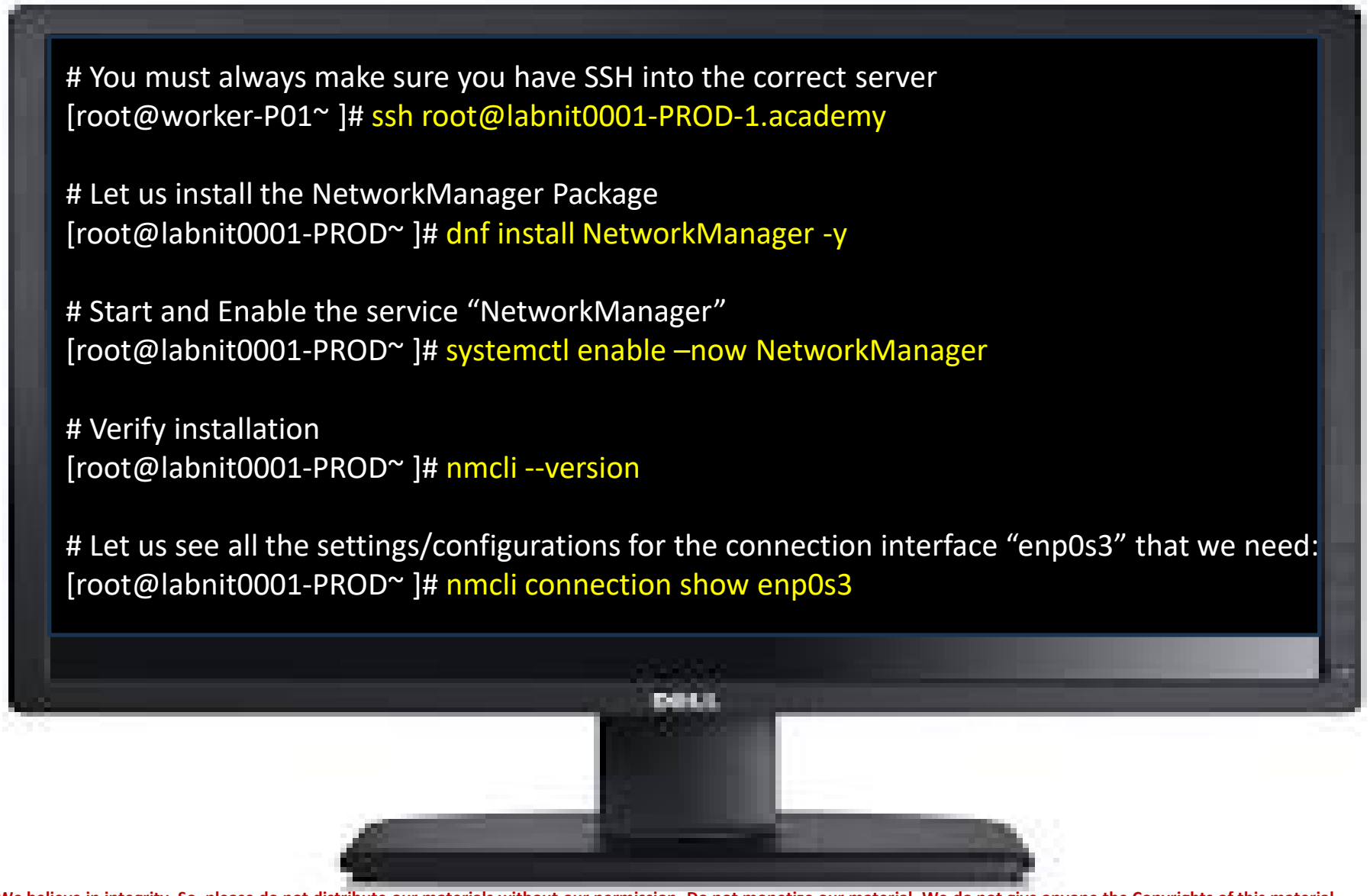
Date: August-26th-2025

```
# You must always make sure you have SSH into the correct server
[root@worker-P01~ ]# ssh root@labnit0001-PROD-1.academy

# Let us use change the name of the server to “myservera”
[root@labnit0001-PROD~ ]# hostnamectl set-hostname myservera

# In which “file” does the “hostnamectl set-hostname command” write that change?
[root@labnit0001-PROD~ ]# /etc/hostname

# Method 1 => to see this change
[root@labnit0001-PROD~ ]# /bin/bash  (or “exec /bin/bash   OR  “su - $USER”
[root@myservera~ ]# /bin/bash

# Method 2 => to see this change is to logout and login
[root@labnit0001-PROD~ ]# logout
```



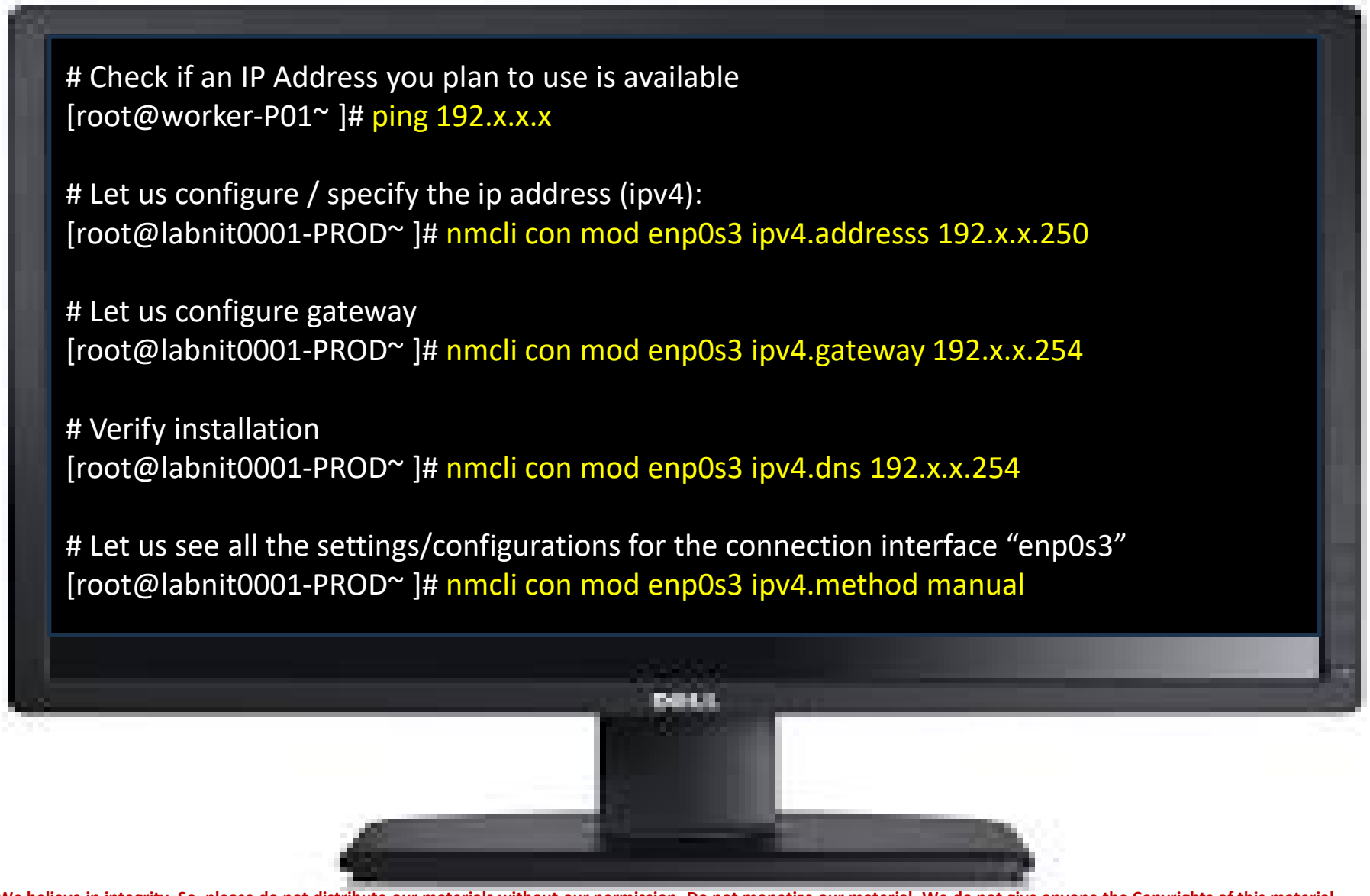
SET STATIC IP

Date: August-26th-2025



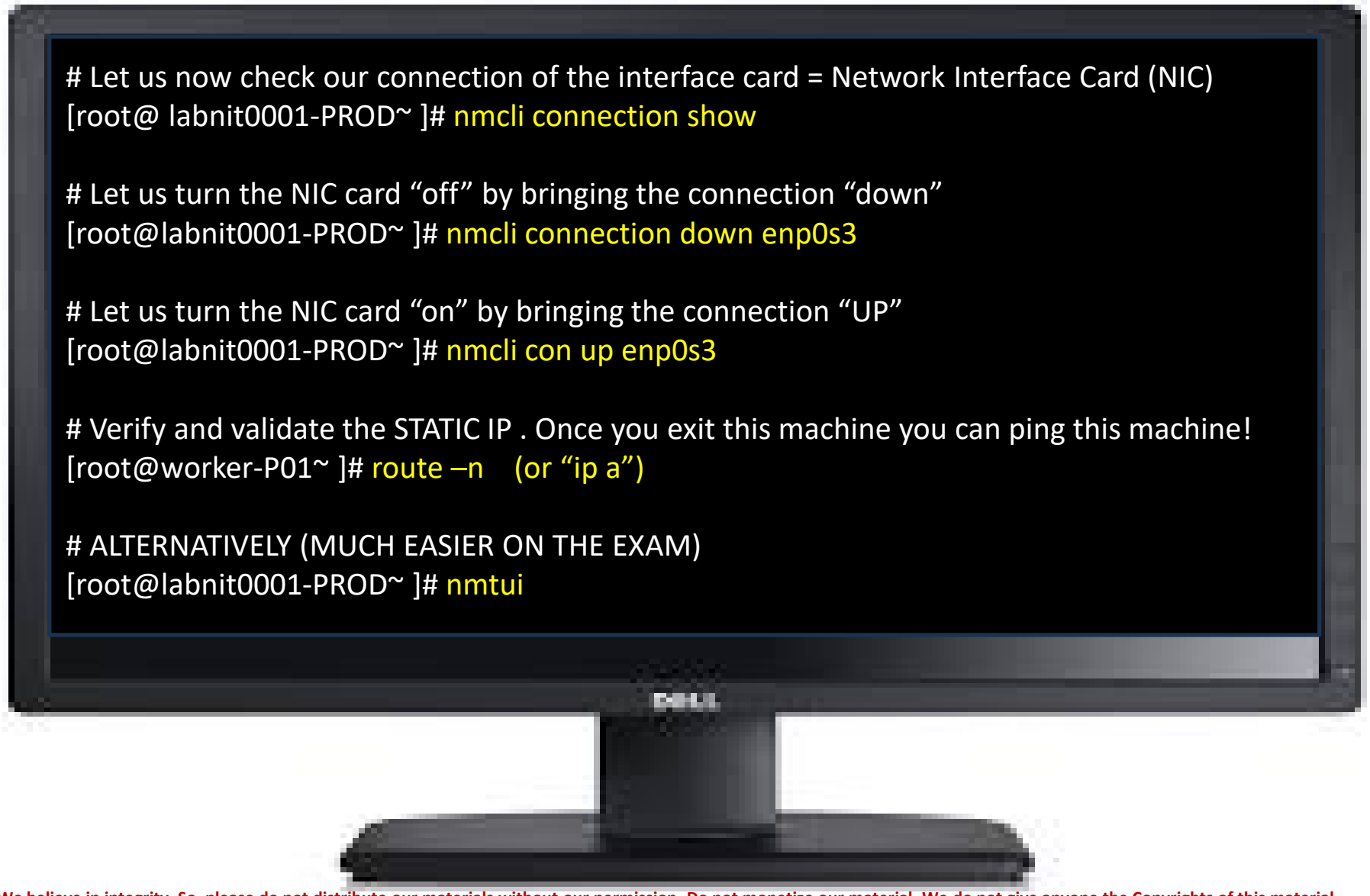
SET STATIC IP

Date: August-26th-2025



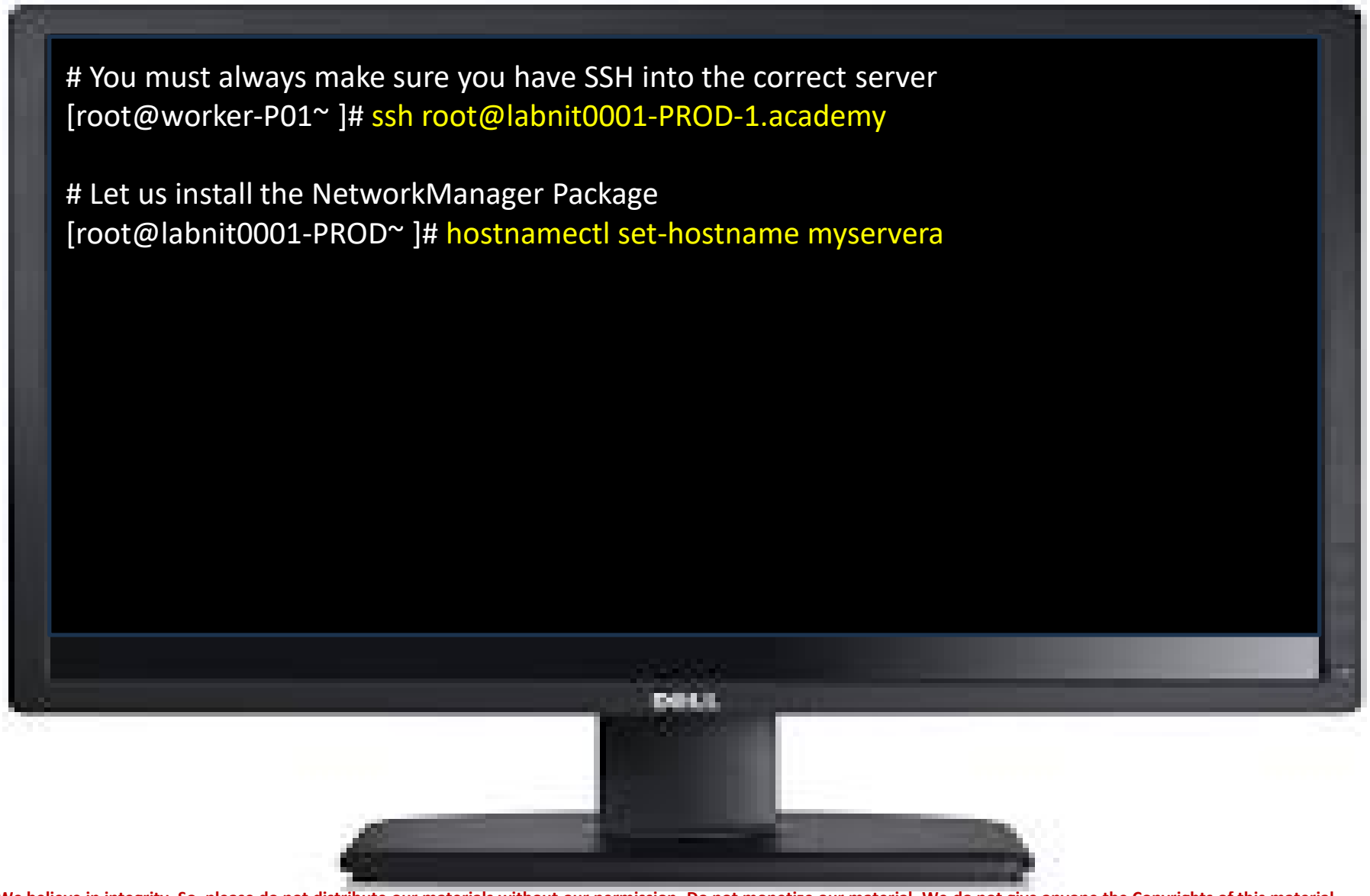
SET STATIC IP

Date: August-26th-2025



PASSWORD RECOVERY

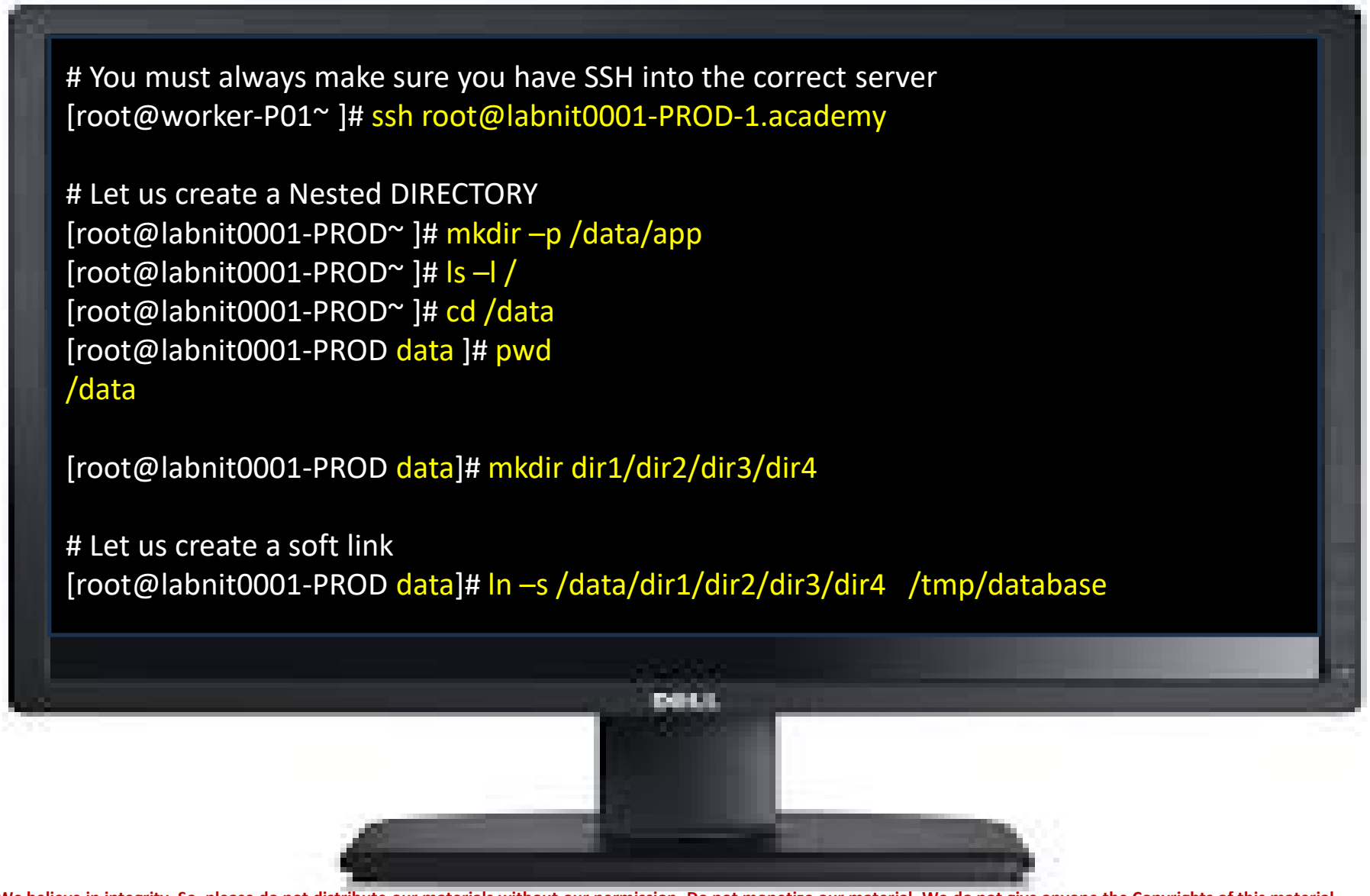
Date: August-26th-2025



CREATE DIRECTORIES AND SOFT LINK

Date: August-26th-2025

```
# You must always make sure you have SSH into the correct server
[root@worker-P01~ ]# ssh root@labnit0001-PROD-1.academy

# Let us create a Nested DIRECTORY
[root@labnit0001-PROD~ ]# mkdir –p /data/app
[root@labnit0001-PROD~ ]# ls –l /
[root@labnit0001-PROD~ ]# cd /data
[root@labnit0001-PROD data ]# pwd
/data

[root@labnit0001-PROD data]# mkdir dir1/dir2/dir3/dir4

# Let us create a soft link
[root@labnit0001-PROD data]# ln –s /data/dir1/dir2/dir3/dir4   /tmp/database
```



CREATE FILE AND HARD LINK

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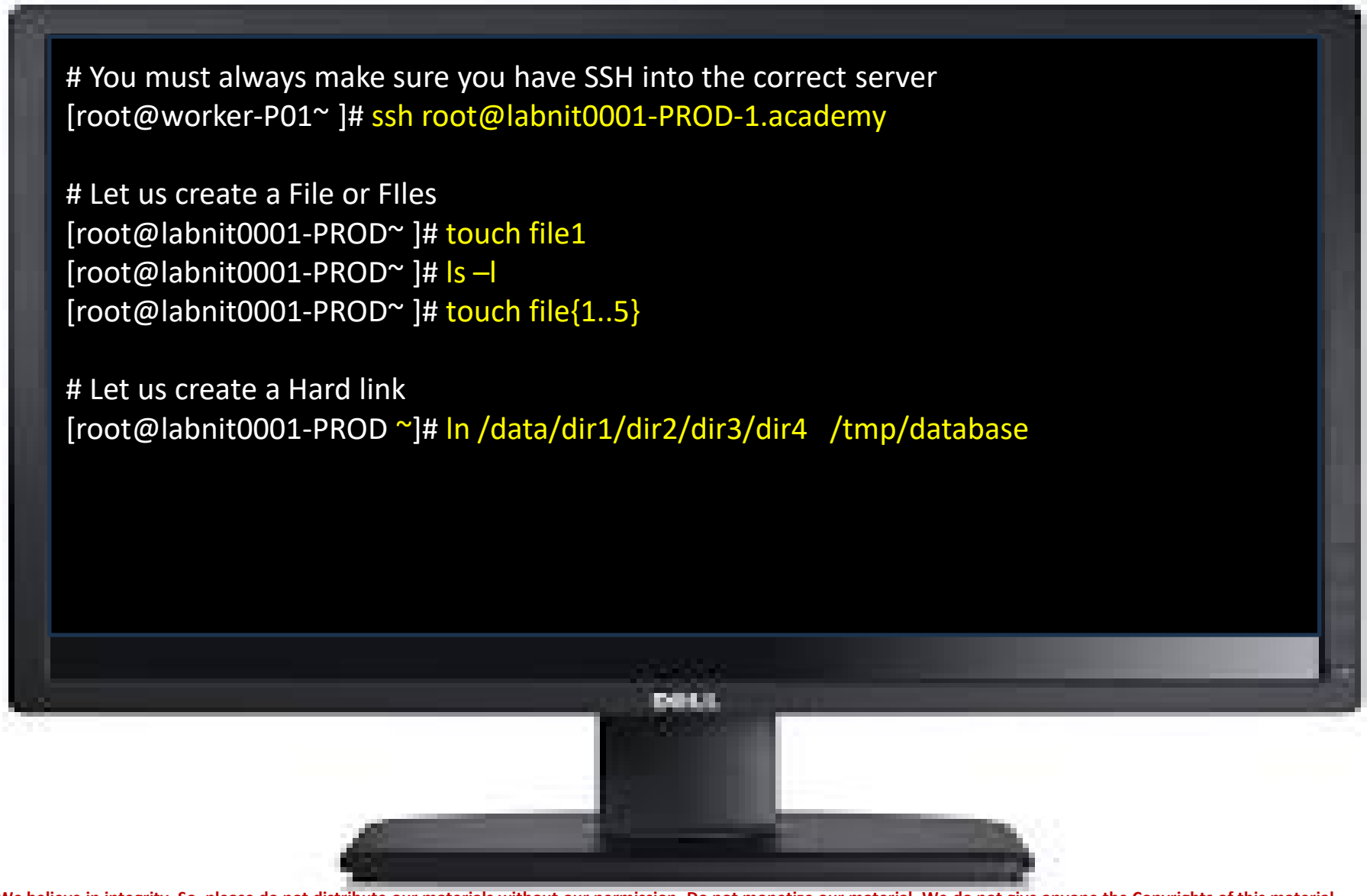


INTERVIEW QUESTION 1: HOW DO YOU RECOVER ROOT PASSWORD

Date: August-26th-2025

Interrupt the boot process to set the root password as **"redhat"** and gain access to System. Procedure :

1. Start (Power on) the System.
2. Wait for GRUB menu to appear and then press e to edit.
3. Find the line starting with linux and type the **rd.break** at the end.
4. Press Ctrl+x to boot the system with these Kernel boot parameters.
5. Root file system is mounted on the disk as read only (this can be verified by mount command) mode => /sysroot [this is a chroot jail environment and must be remounted with r/w permissions].
6. To mount the root file system with r/w permissions
7. #mount -o remount,rw /sysroot
8. Activate chrooted root environment.
9. #chroot /sysroot
10. To set the root password
11. #passwd
12. To relabel the Selinux contexts (This step is important !)
13. #touch /.autorelabel
14. exit (To exit chrooted jail environment)
15. exit (To exit emergency maintenance mode)

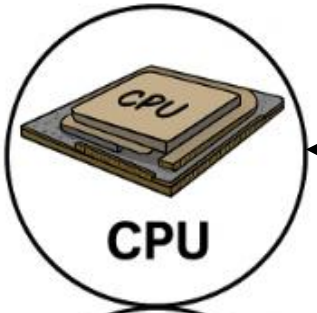
PRODUCTION SERVER PERFORMANCE

Date: August-26th-2025

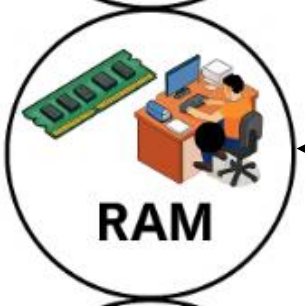
Production Server

Labnit0001-PROD-1.academy

TOP command



CPU SATURATION



MEMORY LEAKAGE / USAGE

Disk Full