Lab 4: Perform Vulnerability Assessment on Docker Images

Lab Scenario

As a professional ethical hacker or pen tester, expertise in Docker vulnerability assessment is crucial. By leveraging tools like Trivy, you can analyze Docker images, identifying and exploiting vulnerabilities. Active scanning and manual inspection reveal weak configurations, enabling you to breach security and implant malicious code, while understanding image location aids in comprehensive security testing and mitigation.

Lab Objectives

- Vulnerability assessment on Docker images using Trivy

Overview of Docker Images

Docker images are lightweight, standalone, executable packages that contain everything needed to run a software application, including the code, runtime, libraries, and dependencies. They enable consistent deployment across various environments, simplify software distribution, and facilitate scalability and reproducibility in containerized environments.

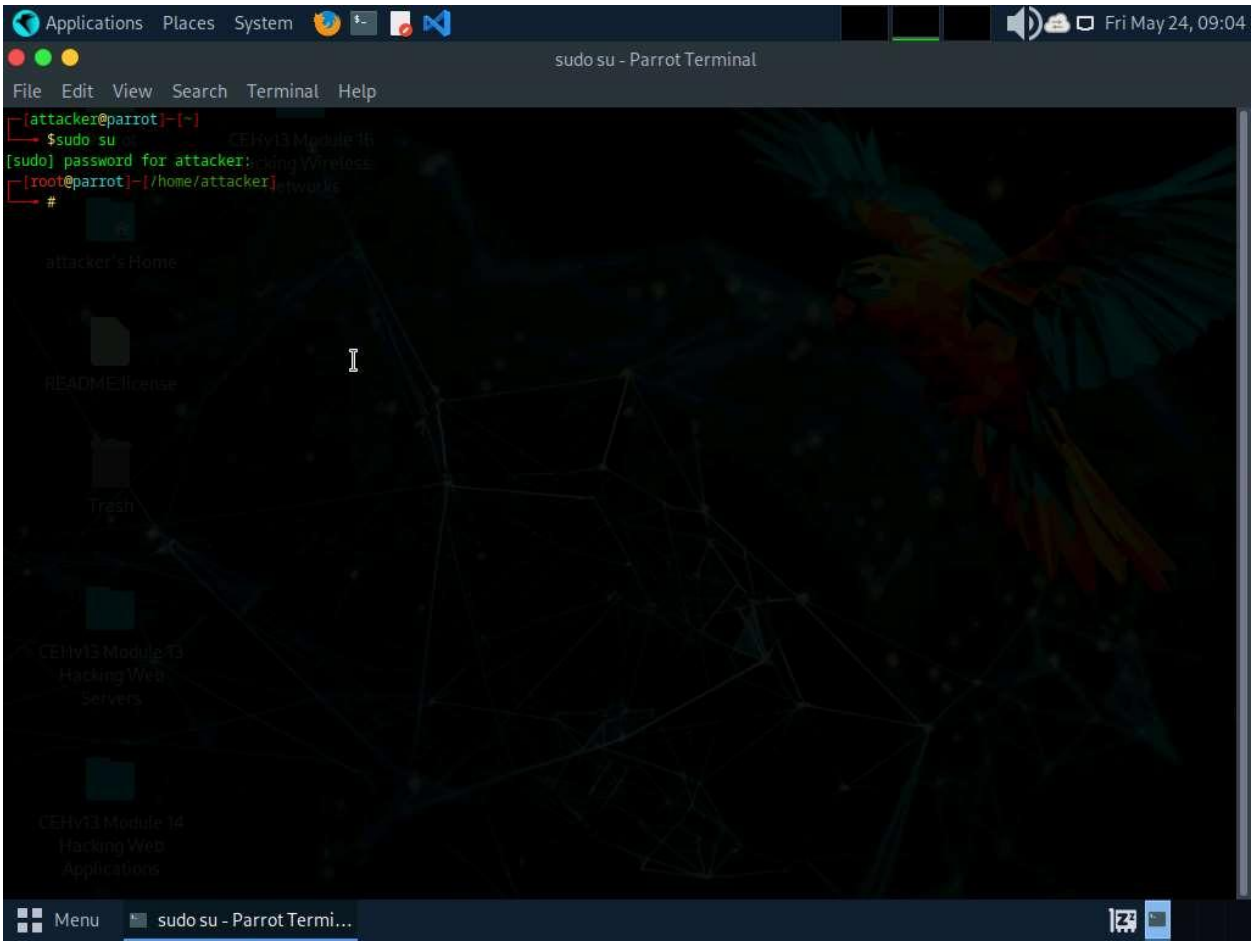
Task 1: Vulnerability Assessment on Docker Images using Trivy

Trivy is a powerful security scanner that detects vulnerabilities and misconfigurations across a wide range of targets, including container images, file systems, Git repositories, virtual machine images, Kubernetes, and AWS. With its comprehensive scanners, Trivy identifies OS package vulnerabilities, sensitive information, IaC issues, and more, providing a robust security solution for your infrastructure.

1. In the **Parrot Security** machine, click the **MATE Terminal** icon in the menu to launch the terminal.
2. A **Parrot Terminal** window appears. In the terminal window, type **sudo su** and press **Enter** to run the programs as a root user.
3. In the **[sudo] password for attacker** field, type **toor** as a password and press **Enter**.

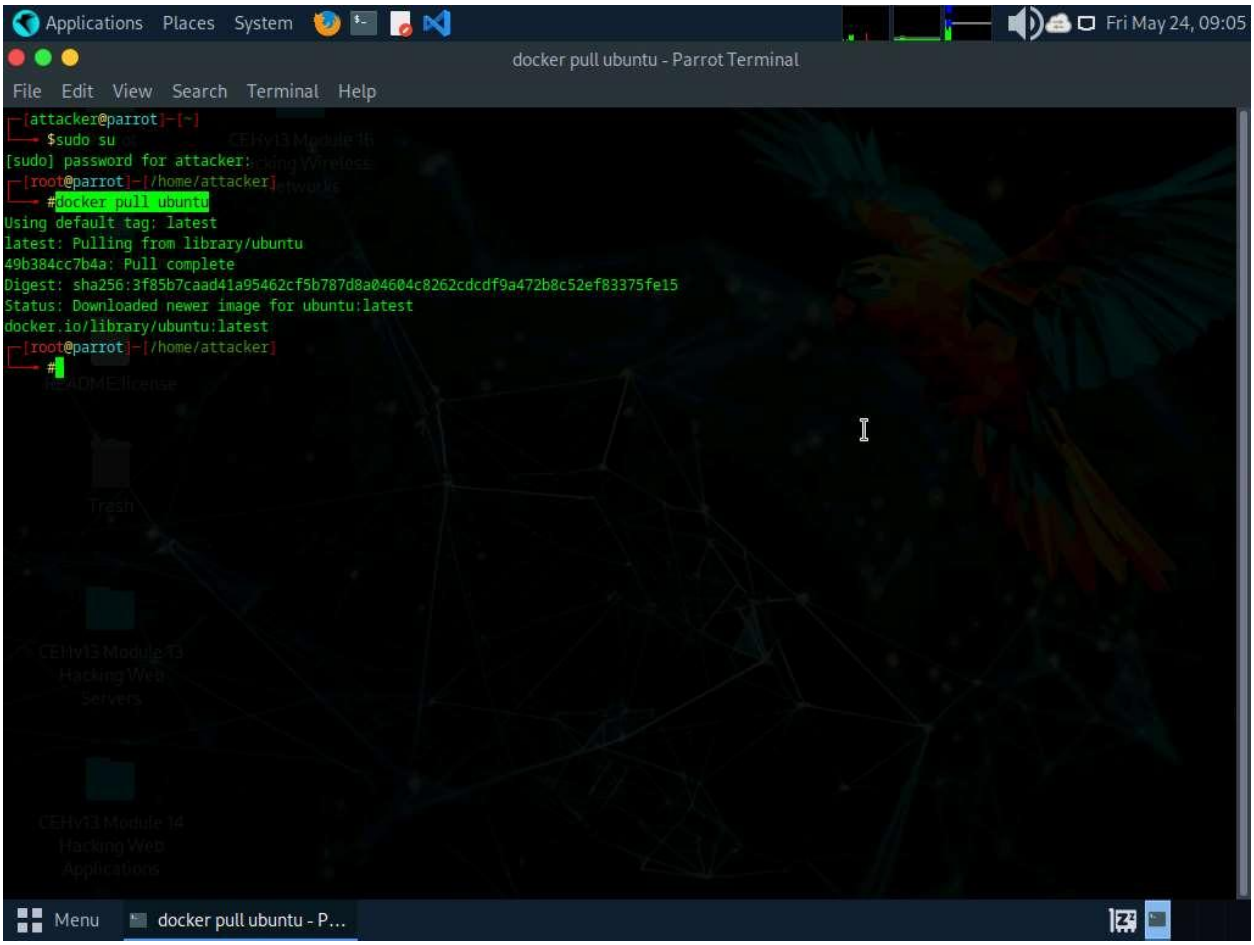
The password that you type will not be visible.

Minimise the terminal for better view of output

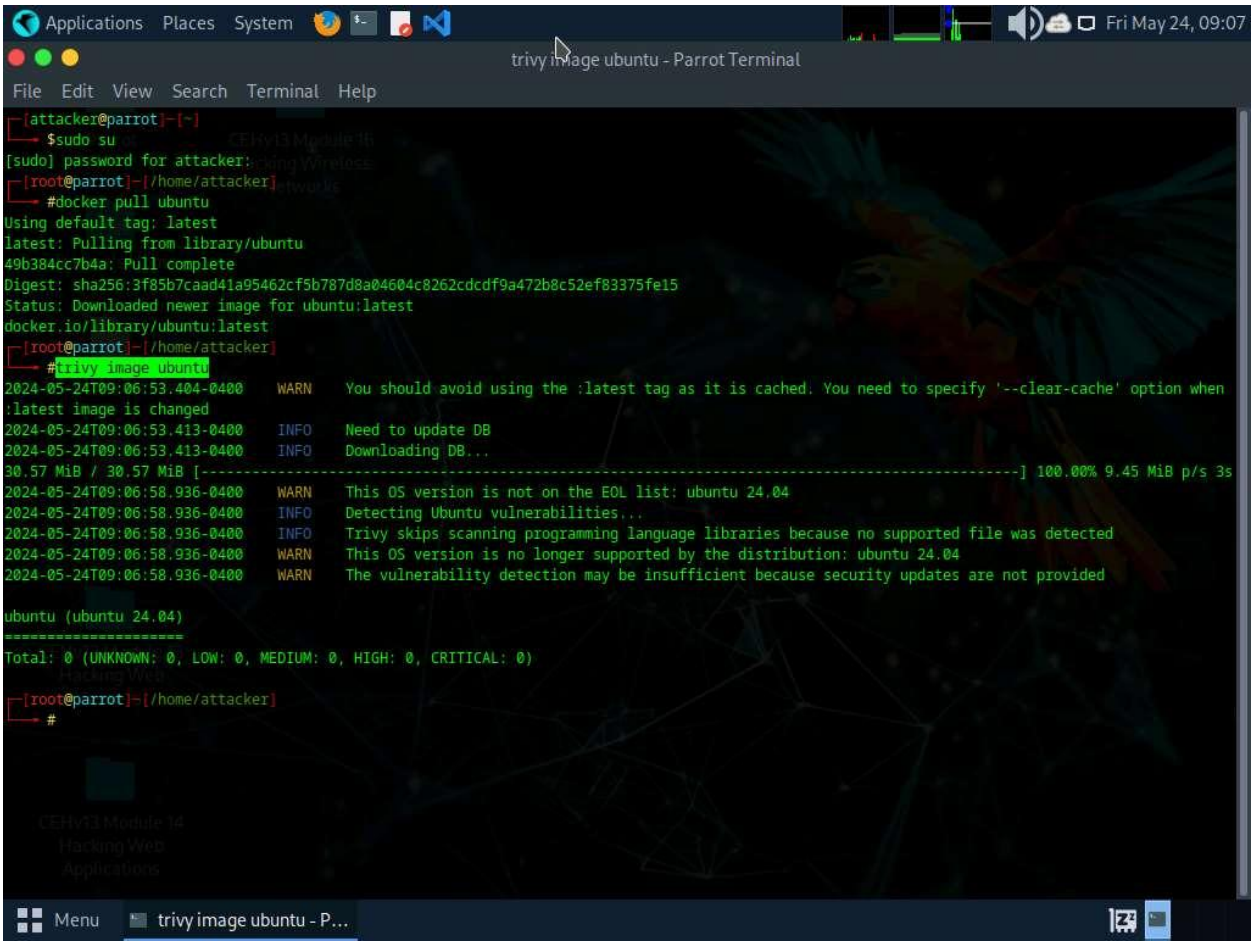


4. In this lab we will be scanning two docker images, first the secure one and second the vulnerable one.

5. Execute command **docker pull ubuntu** to install the first docker image.

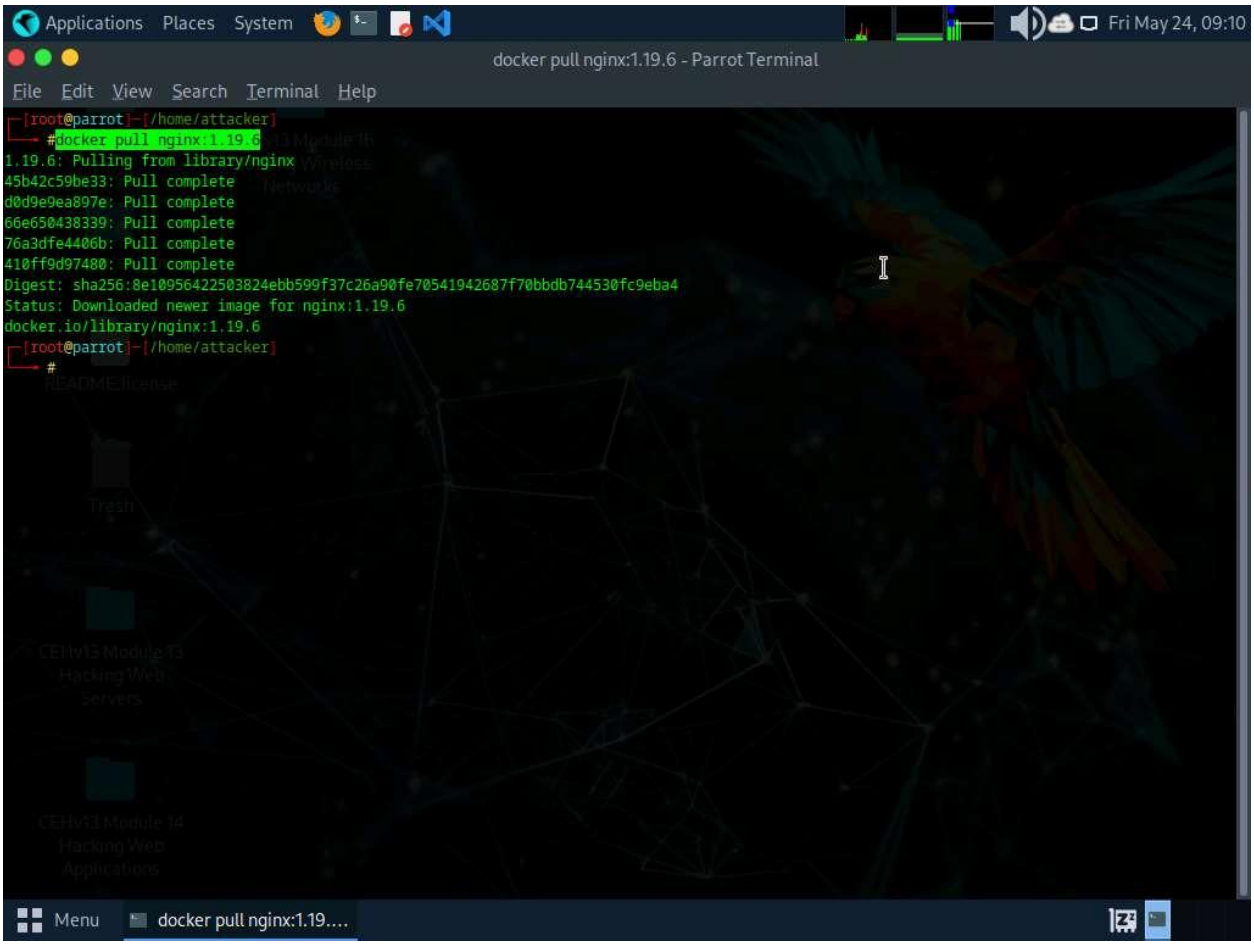


6. Once the image is pulled we will be performing vulnerability assessment. Execute command **trivy image ubuntu**.

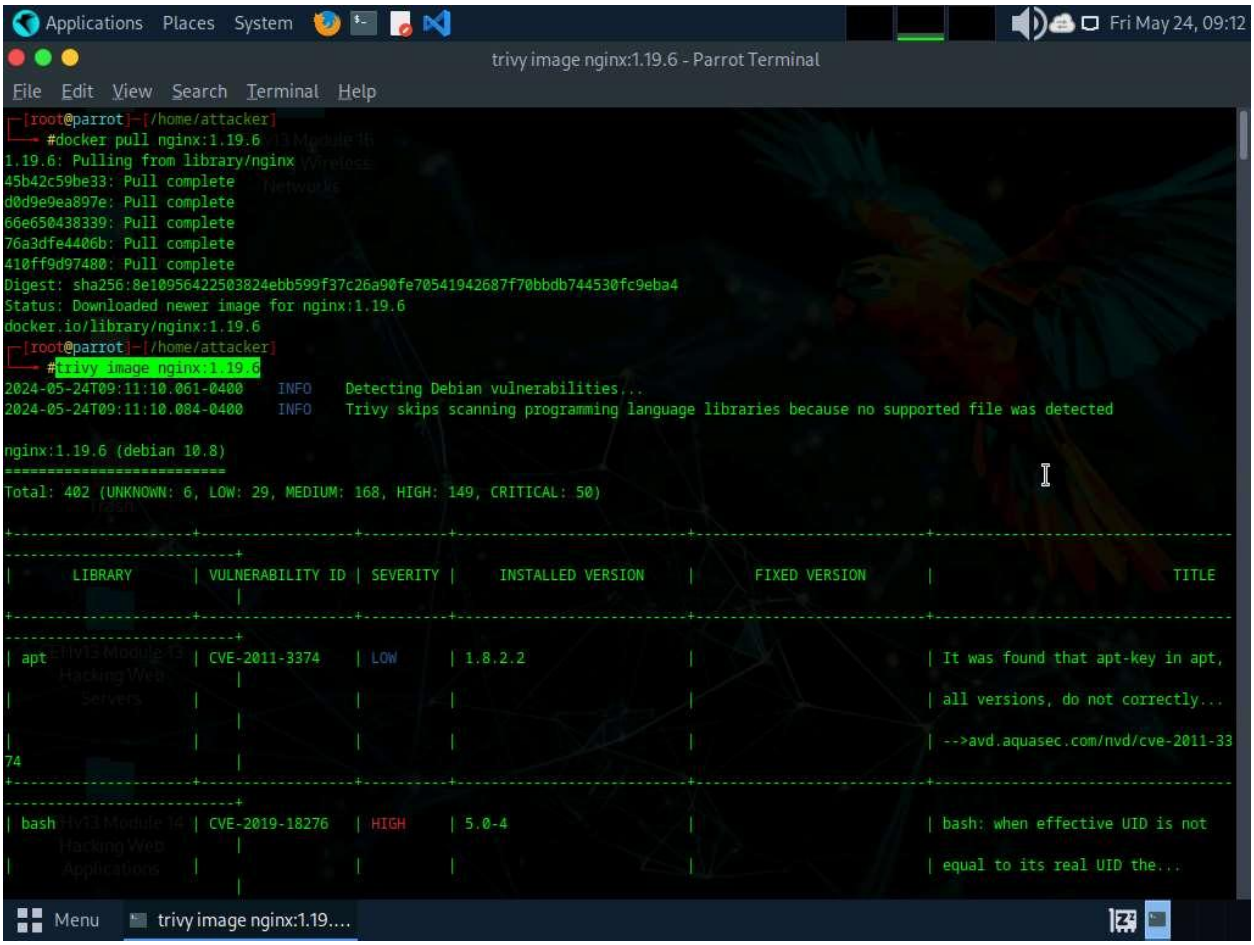


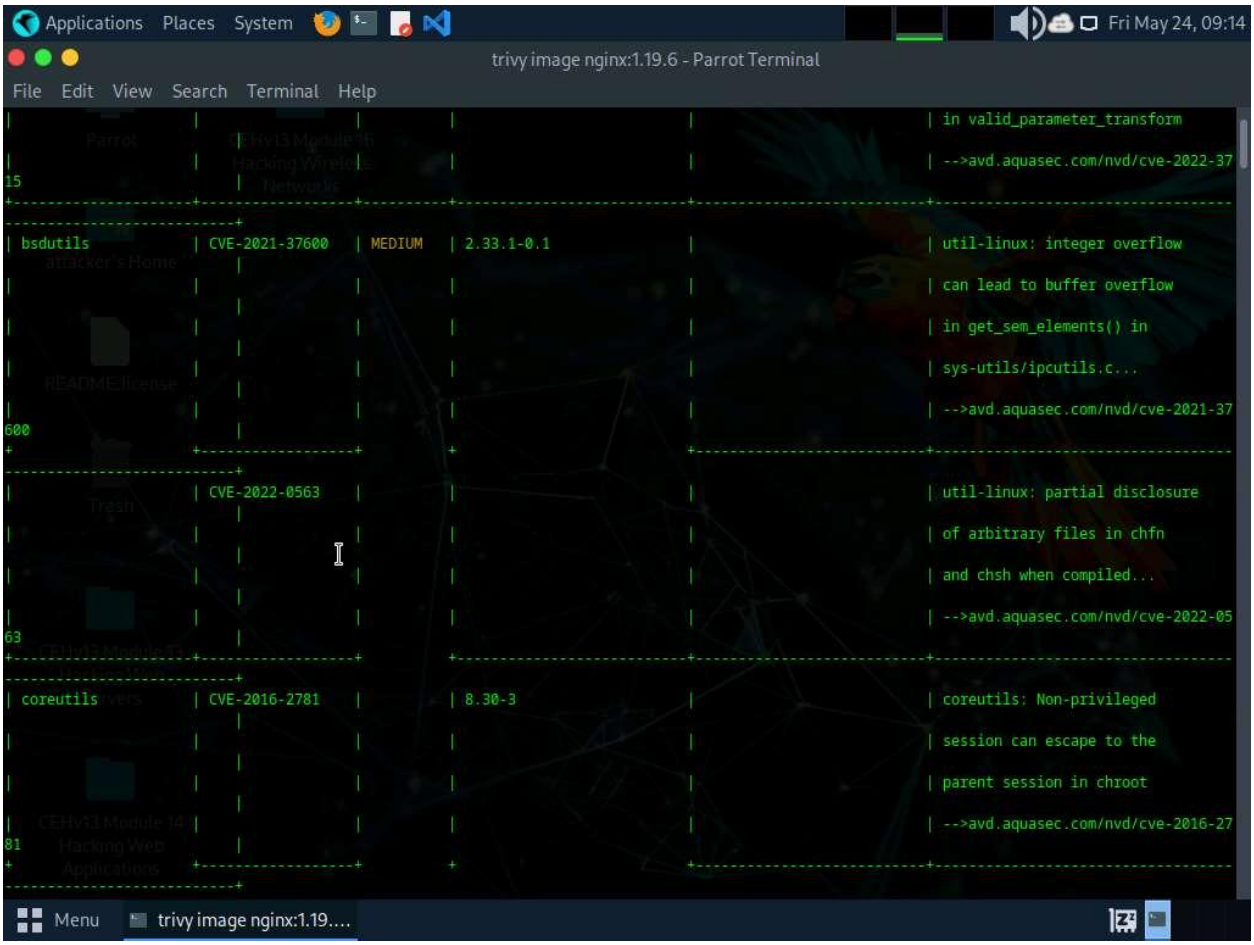
7. In the above screenshot, we can observe that we have total **0** vulnerability and it's completely secure.

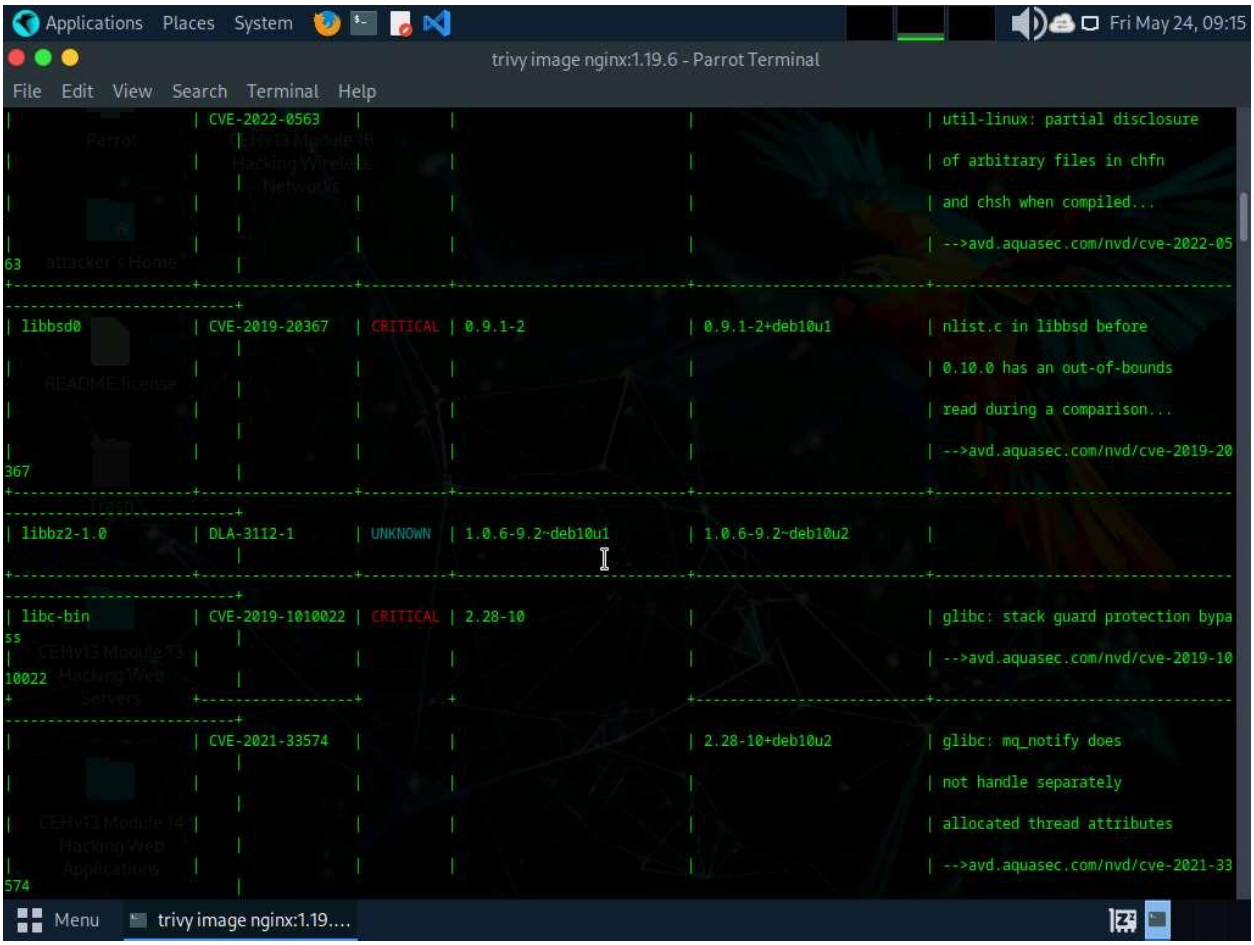
8. Now, we will analyse the vulnerbale image. execute command **docker pull nginx:1.19.6** to pull the vulnerable image.



9. Execute command **trivy image nginx:1.19.6** to scan the image.


Applications Places System
Fri May 24, 09:12
trivy image nginx:1.19.6 - Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[/home/attacker]
#docker pull nginx:1.19.6
1.19.6: Pulling from library/nginx
45b42c59be33: Pull complete
d0d9e9ea897e: Pull complete
66e650438339: Pull complete
76a3dfe4406b: Pull complete
410ff9d97480: Pull complete
Digest: sha256:8e10956422503824ebb599f37c26a90fe70541942687f70bbdb744530fc9eba4
Status: Downloaded newer image for nginx:1.19.6
docker.io/library/nginx:1.19.6
[root@parrot]-[/home/attacker]
#trivy image nginx:1.19.6
2024-05-24T09:11:10.061-0400 INFO Detecting Debian vulnerabilities...
2024-05-24T09:11:10.084-0400 INFO Trivy skips scanning programming language libraries because no supported file was detected
nginx:1.19.6 (debian 10.8)
Total: 402 (UNKNOWN: 6, LOW: 29, MEDIUM: 168, HIGH: 149, CRITICAL: 50)
LIBRARY | VULNERABILITY ID | SEVERITY | INSTALLED VERSION | FIXED VERSION | TITLE
apt | CVE-2011-3374 | LOW | 1.8.2.2 | | It was found that apt-key in apt, all versions, do not correctly... -->avd.aquasec.com/nvd/cve-2011-3374
bash | CVE-2019-18276 | HIGH | 5.0-4 | | bash: when effective UID is not equal to its real UID the...
Menu
trivy image nginx:1.19....


Applications Places System
Fri May 24, 09:14
trivy image nginx:1.19.6 - Parrot Terminal
File Edit View Search Terminal Help
| | | | | | in valid_parameter_transform
| | | | | | -->avd.aquasec.com/nvd/cve-2022-37
15
| bsdutils | CVE-2021-37600 | MEDIUM | 2.33.1-0.1 | | util-linux: integer overflow
| | | | | | can lead to buffer overflow
| | | | | | in get_sem_elements() in
| | | | | | sys-utils/ipcutils.c...
| | | | | | -->avd.aquasec.com/nvd/cve-2021-37
600
| | CVE-2022-0563 | | | | util-linux: partial disclosure
| | | | | | of arbitrary files in chfn
| | | | | | and chsh when compiled...
| | | | | | -->avd.aquasec.com/nvd/cve-2022-05
63
| coreutils | CVE-2016-2781 | | 8.30-3 | | coreutils: Non-privileged
| | | | | | session can escape to the
| | | | | | parent session in chroot
| | | | | | -->avd.aquasec.com/nvd/cve-2016-27
81
Menu
trivy image nginx:1.19....



10. In the above screenshot we can see that we have total **401** vulnerabilities which is categorized as well along with **CVEs** mentioned.
11. This concludes the demonstration of vulnerability assessment on docker images using Trivy
12. Close all open windows and document all acquired information.

Question 19.4.1.1

In Parrot machine install ubuntu and nginx:1.19.6 images and scan with trivy security scanner. Enter the severity level that can be observed for bsdutils vulnerability of nginx:1.19.6 docker image.