

Module 19 cloud computing

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1 What is cloud computing

Cloud computing is a technology that allows users to access computing resources—such as servers, storage, databases, networking, software, and analytics—over the internet, instead of using local servers or personal devices. It offers on-demand availability of these resources, providing flexibility and scalability according to business needs.

Cloud computing operates on a pay-as-you-go model, which helps reduce costs by eliminating the need for heavy upfront investments in hardware and maintenance. There are different types of cloud services, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Cloud environments can be public, private, or hybrid, depending on how resources are managed and who can access them. Key benefits of cloud computing include high availability, disaster recovery, automatic updates, and support for remote work. It enables organizations to innovate faster and focus on their core operations rather than managing IT infrastructure.

2 types of cloud computing

✓ **Public Cloud:**

Public cloud services are provided by third-party vendors (like AWS, Microsoft Azure, or Google Cloud) over the internet. The infrastructure is shared among multiple users (tenants), offering scalability, flexibility, and cost efficiency on a pay-as-you-go basis.

✓ **Private Cloud:**

A private cloud is dedicated to a single organization and can be hosted on-premises or by a service provider. It offers greater control, security, and customization, ideal for businesses with strict regulatory or data privacy needs.

✓ **Hybrid Cloud:**

Hybrid cloud combines public and private cloud environments, enabling data and applications to move between them. This provides flexibility, scalability, and better security control depending on the workload requirements.

✓ **Community Cloud:**

A community cloud is shared by multiple organizations that have common concerns, such as compliance, security, or mission. It is jointly managed and supports

collaborative efforts while keeping sensitive data protected.

what is container?

A **container** is a lightweight, standalone, and executable software package that includes everything needed to run an application—such as the code, runtime, system tools, libraries, and settings. Containers isolate applications from the host system and from each other, ensuring consistency across different computing environments.

Unlike virtual machines, containers share the host operating system's kernel, making them faster to start, more efficient, and less resource-heavy. Tools like **Docker** and **Kubernetes** are commonly used to create, manage, and orchestrate containers in cloud and enterprise environments.

1 task lazys3 to brute force AWS s3 buckets using lazys3 tool

Download the lazys3 github

Step1 start the kali linux open the terminal

Step2 go to cd lazys3

```
File Actions Edit View Help
(mayur@vbox) ~ %
$ rm -rfn
(root@vbox) /home/mayur
# cd lazy3
(mayur@vbox) /home/mayur/lazy3 %
$ ls
common_bucket_prefixes.txt lazy3.rb README.md
(root@vbox) /home/mayur/lazy3 %
$
```

Step3 chmod tx lazys3.rb

Step4: ruby lazys3.rb

```
File: Address: Edit: View: Help  
-> cd /tmp/lazy3.rb  
Generated wordlist from file, 8817 items...  
Found buckets: ()  
Found buckets: -admin-dev ()  
Found buckets: -admin-dev ()  
Found buckets: -admindev ()  
Found buckets: -admin-dev ()  
Found buckets: -admin-dev ()  
Found buckets: -admin-development ()  
Found buckets: -admin_development ()  
Found buckets: -admindevelopment ()  
Found buckets: -admin-development ()  
Found buckets: -admin_development ()  
Found buckets: -admin-stage ()  
Found buckets: -admin_stage ()  
Found buckets: -adminstage ()  
Found buckets: -admin-stage ()  
Found buckets: -admin-stage ()  
Found buckets: -admin-12 ()  
Found buckets: -admin12 ()  
Found buckets: -admin3 ()  
Found buckets: -admin3 ()  
Found buckets: -admin-s ()  
Found buckets: -admin_s ()  
Found buckets: -admin-staging ()  
Found buckets: -admin_staging ()  
Found buckets: -adminstaging ()  
Found buckets: -adminstaging ()  
Found buckets: -admin-staging ()  
Found buckets: -admin_staging ()  
Found buckets: -admin-prod ()  
Found buckets: -adminprod ()  
Found buckets: -admin-prod ()
```

```
The Actions: Edit, View, Help  
Found bucket: build  
Found bucket: -build  
Found bucket: build (403)  
Found bucket: bulletins  
Found bucket: bulletins-  
Found bucket: bulletins (403)  
Found bucket: business-prod  
Found bucket: business-prod-  
Found bucket: -business-prod  
Found bucket: business-prod (403)  
Found bucket: .com  
Found bucket: -com  
Found bucket: com-  
Found bucket: com (403)  
Found bucket: -cdn  
Found bucket: cloud  
Found bucket: cloud- (403)  
Found bucket: cloud (403)  
Found bucket: -cloud  
Found bucket: cloudtrail  
Found bucket: -cloudtrail  
Found bucket: -cloudtrail (403)  
Found bucket: cloudtrial (403)  
Found bucket: octan  
Found bucket: -octan  
Found bucket: octan (403)  
Found bucket: class  
Found bucket: -class  
Found bucket: class (403)  
Found bucket: classs  
Found bucket: -classs  
Found bucket: classs (403)  
Found bucket: -cloud  
Found bucket: -cloud-  
Found bucket: -cloud (403)
```

S3Scanner

Q What is S3Scanner?

S3Scanner is an open-source AWS S3 bucket enumeration tool that helps security professionals, penetration testers, and bug bounty hunters identify publicly accessible or misconfigured Amazon S3 buckets.

❑ Simple Definition:

S3Scanner scans a list of potential S3 bucket names and tells you which ones exist and whether they are publicly accessible.



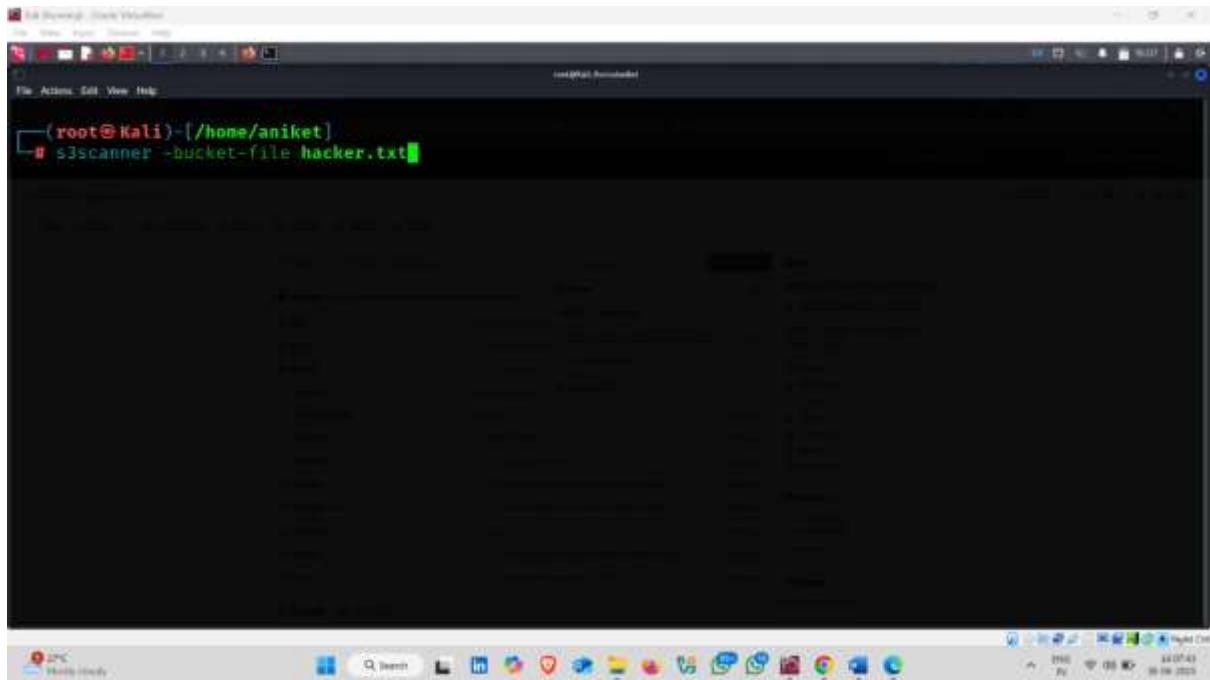
How to use it :-

- I have already one txt file that contain 3 websites

```
(root㉿Kali)-[~/home/aniket]
└─# cat hacker.txt
flows.cloud
certifiedhacker
testfire
└─#
```

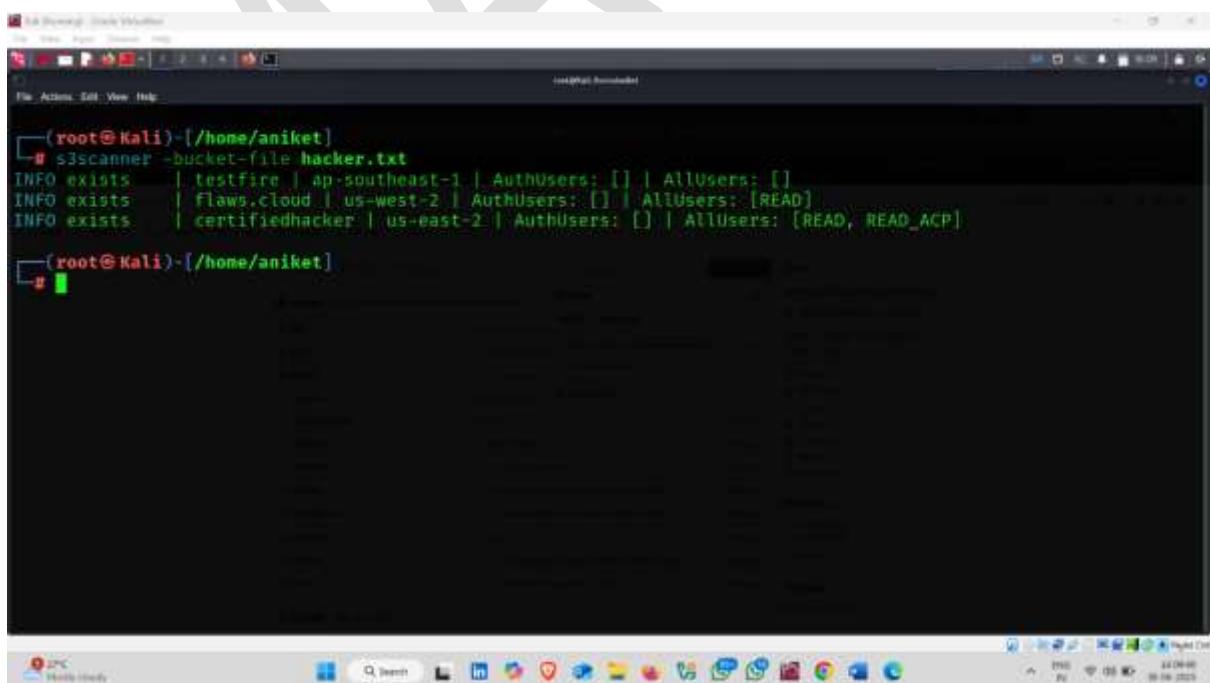
- Type following command

Command :- s3scanner -bucket-file hacker.txt



```
(root@Kali)-[/home/aniket]
# s3scanner -bucket-file hacker.txt
```

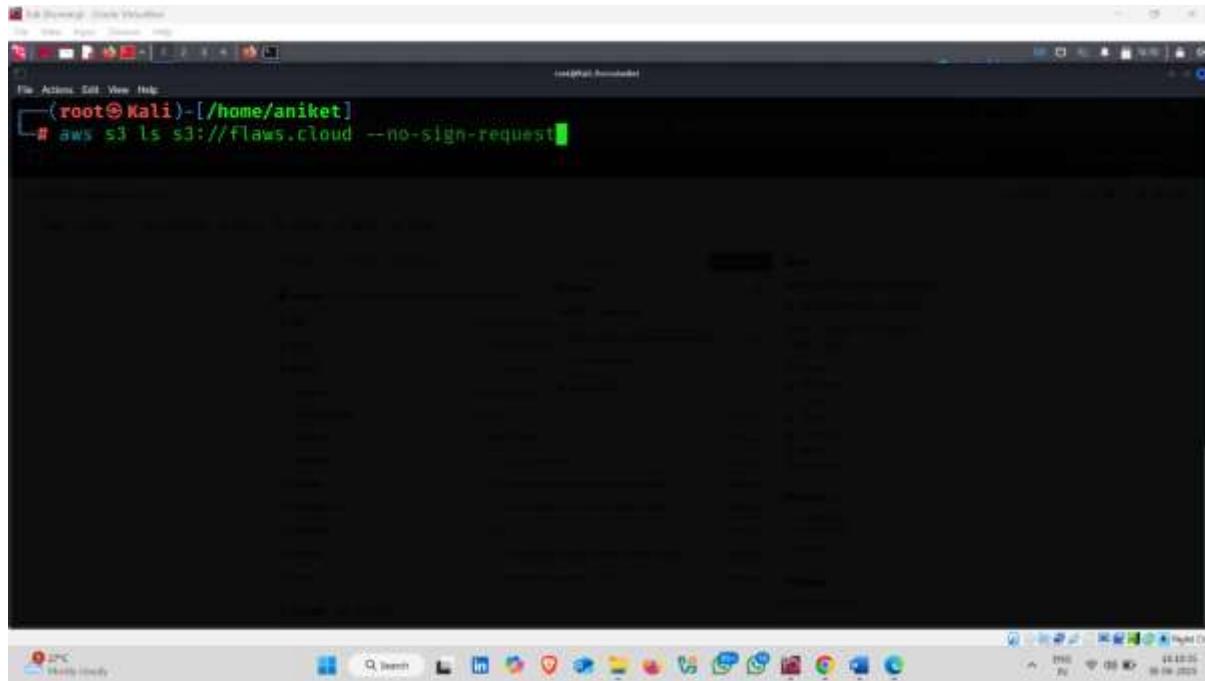
- S3Scanner found three existing S3 buckets: **flaws.cloud** and **certifiedhacker** are publicly readable, while **testfire** exists but is private. **certifiedhacker** also exposes its access control policy (READ_ACP).



```
(root@Kali)-[/home/aniket]
# s3scanner -bucket-file hacker.txt
INFO exists  | testfire | ap-southeast-1 | AuthUsers: [] | AllUsers: []
INFO exists  | Flaws.cloud | us-west-2 | AuthUsers: [] | AllUsers: [READ]
INFO exists  | certifiedhacker | us-east-2 | AuthUsers: [] | AllUsers: [READ, READ_ACP]
```

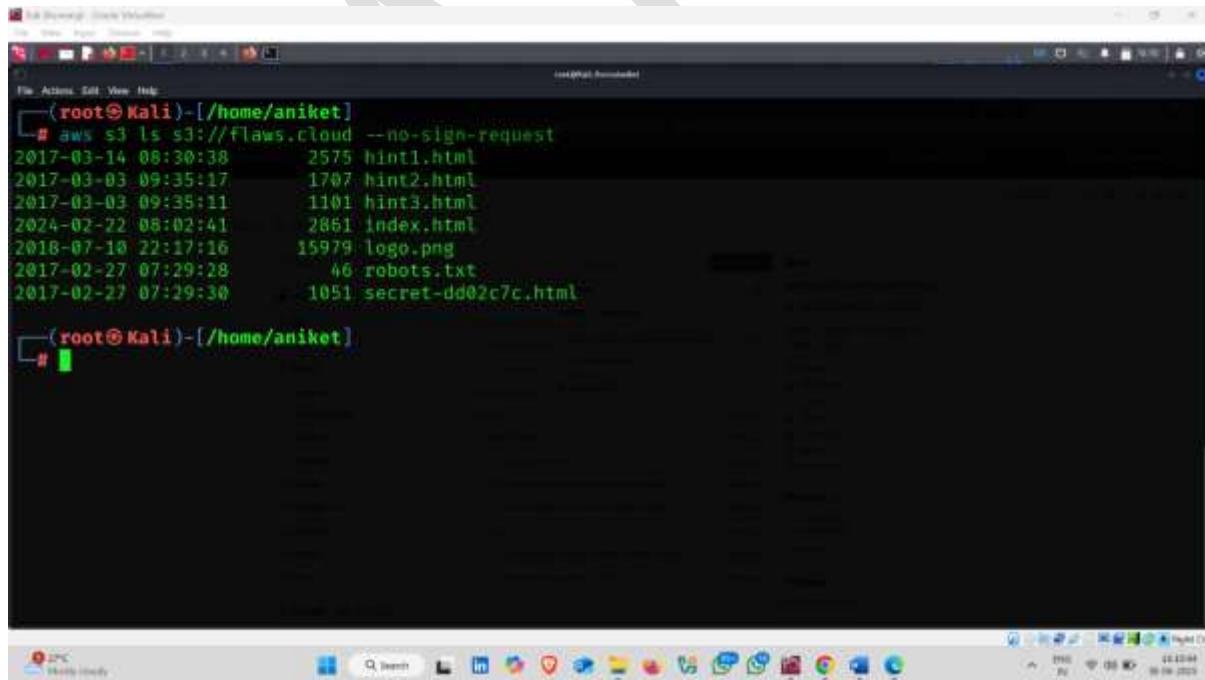
- Type next command

Command :- aws s3 ls s3://flaws.cloud –no-sign-request



```
(root@Kali)-[/home/aniket]
# aws s3 ls s3://flaws.cloud --no-sign-request
```

- Result  



```
(root@Kali)-[/home/aniket]
# aws s3 ls s3://flaws.cloud --no-sign-request
2017-03-14 08:30:38      2575 hint1.html
2017-03-03 09:35:17      1707 hint2.html
2017-03-03 09:35:11      1101 hint3.html
2024-02-22 08:02:41      2861 index.html
2018-07-10 22:17:16     15979 logo.png
2017-02-27 07:29:28       46 robots.txt
2017-02-27 07:29:30     1051 secret-dd02c7c.html

(root@Kali)-[/home/aniket]
#
```

Task3 perform Vulnerability docker image using trivy

Trivy (pronounced "triv-ee") is a free and open-source vulnerability scanner used to find security issues in:

- Docker containers
 - Operating systems & packages
 - Infrastructure as Code (IaC) (e.g., Terraform, CloudFormation)
 - Cloud services (AWS)
 - SBOMs (Software Bill of Materials)
-

Simple Definition:

Trivy is a tool that quickly scans your container images, code, or cloud for vulnerabilities and misconfigurations before you deploy them.

How to use it :-

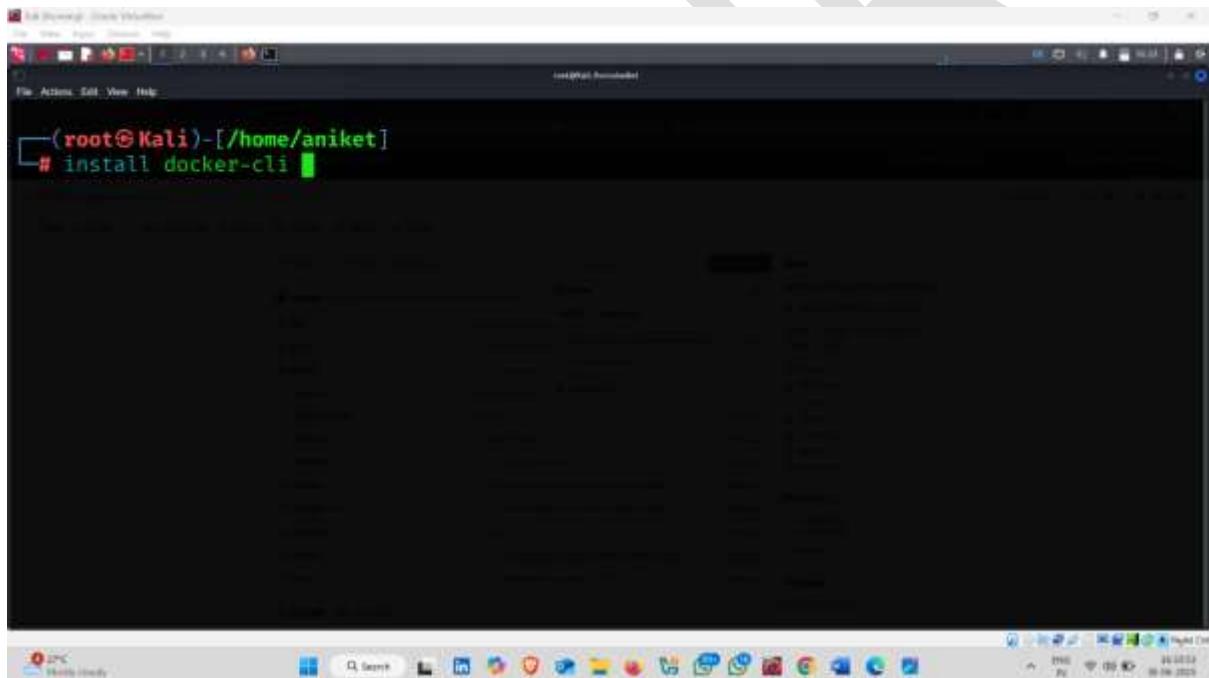
- Type following command

Command :-: install docker-cli

Explanation :-:

This command installs only the Docker Command Line Interface (CLI) — which means:

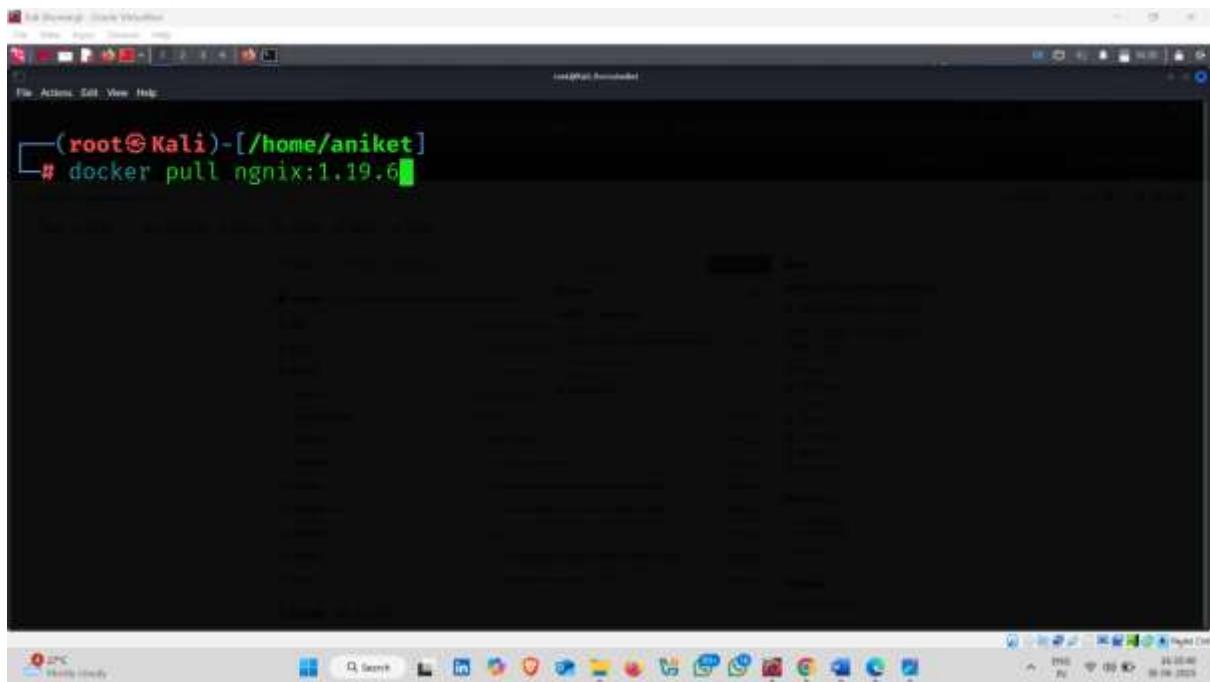
You can run docker commands (like docker pull, docker run, etc.) on the system.



A screenshot of a terminal window titled "root@Kali:[/home/aniket]". The window shows a command-line interface with the prompt "(root@Kali)-[/home/aniket]". Below the prompt, the command "# install docker-cli" is being typed. The background of the terminal is dark, and the text is white or light-colored. The terminal is running on a Kali Linux operating system, as indicated by the title bar and the root user indicator.

- Type next command

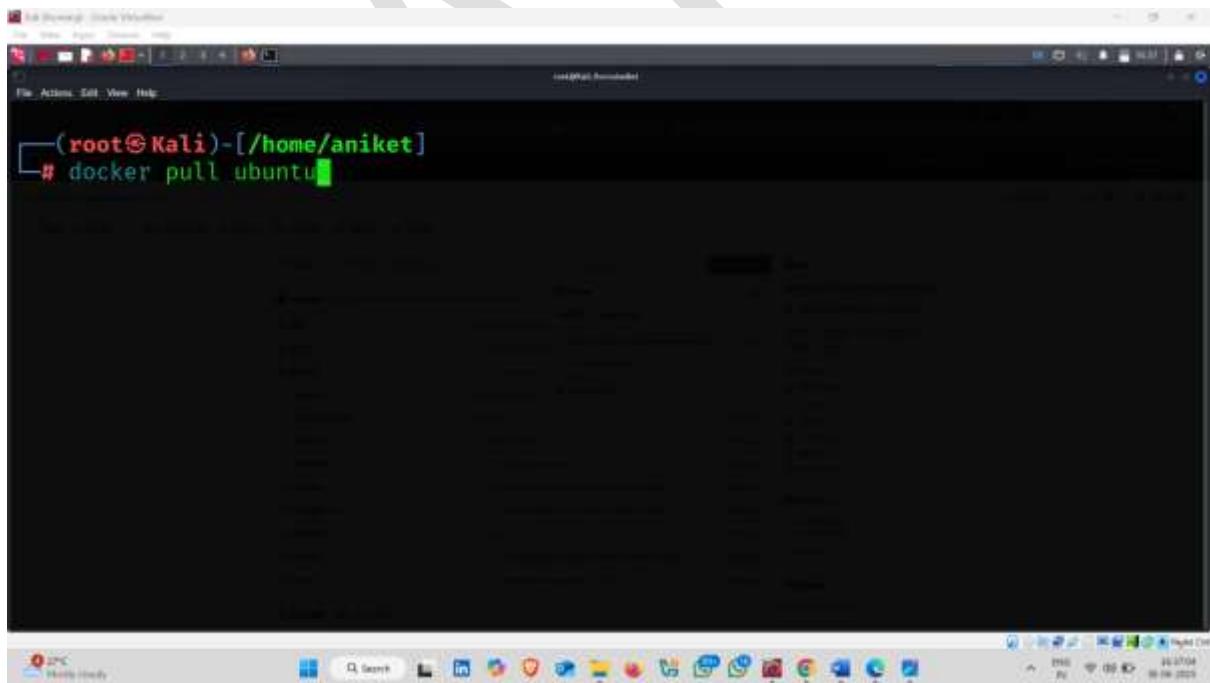
Command :-: docker pull nginx:1.19.6



```
(root㉿Kali)-[~/home/aniket]
# docker pull nginx:1.19.6
```

- Type next command

Command :- docker pull ubuntu



```
(root㉿Kali)-[~/home/aniket]
# docker pull ubuntu
```



```
(root㉿Kali)-[~/home/aniket]
└─# docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
Digest: sha256:b59d21599a2b151e23eea5f6602f4af4d7d31c4e236d22bf0b62b86d2e386b8f
Status: Image is up to date for ubuntu:latest
docker.io/library/ubuntu:latest

(root㉿Kali)-[~/home/aniket]
└─#
```

- Next command

Command :- trivy image ubuntu



```
(root㉿Kali)-[~/home/aniket]
└─# trivy image ubuntu
```

```
(root㉿Kali)-[/home/aniket]
# trivy image ubuntu
2025-06-30T16:37:42+05:30    INFO  [vulndb] Need to update DB
2025-06-30T16:37:42+05:30    INFO  [vulndb] Downloading vulnerability DB ...
2025-06-30T16:37:42+05:30    INFO  [vulndb] Downloading artifact ...      repo="mirror.gcr.io/aquasec/trivy-db:2"
```

- Result – vulnerabilities found ↕ ✓

Library Fixed Version	Vulnerability	Severity	Status	Installed Version
			Title	
coreutils	CVE-2016-2781 coreutils: Non-privileged session can escape to the parent session in chroot	LOW	affected	9.4-3ubuntu6
				https://avd.aquasec.com/nvd/cve-2016-2781
gpgv	CVE-2022-3219 gnupg: denial of service issue (resource consumption) using compressed packets			2.4.4-2ubuntu17.2
				https://avd.aquasec.com/nvd/cve-2022-3219



```
File (Running) | Help | VirtualBox  
File View Insert Devices View  
File Actions Edit View Help  
  
compressed packets  
https://avd.aquasec.com/nvd/cve-2022-3219  
  
libc-bin  
| CVE-2016-20013 sha256crypt and sha512crypt through 0.6 allow attackers to  
| cause a denial of ...  
| https://avd.aquasec.com/nvd/cve-2016-20013  
  
libc6  
  
2.39-0ubuntu8.4
```