Pratik Agrawal

500123601

Devops B2

Lab Exercise 1- Docker Fundamental Commands

Objective

Learn and practice the fundamental Docker CLI commands to:

- Manage images and containers
- Understand container lifecycle
- Build and run applications using Docker

---

1. Setup

Prerequisites

- Docker installed on your system

  (Check using: docker --version)
- Internet access to pull images

---

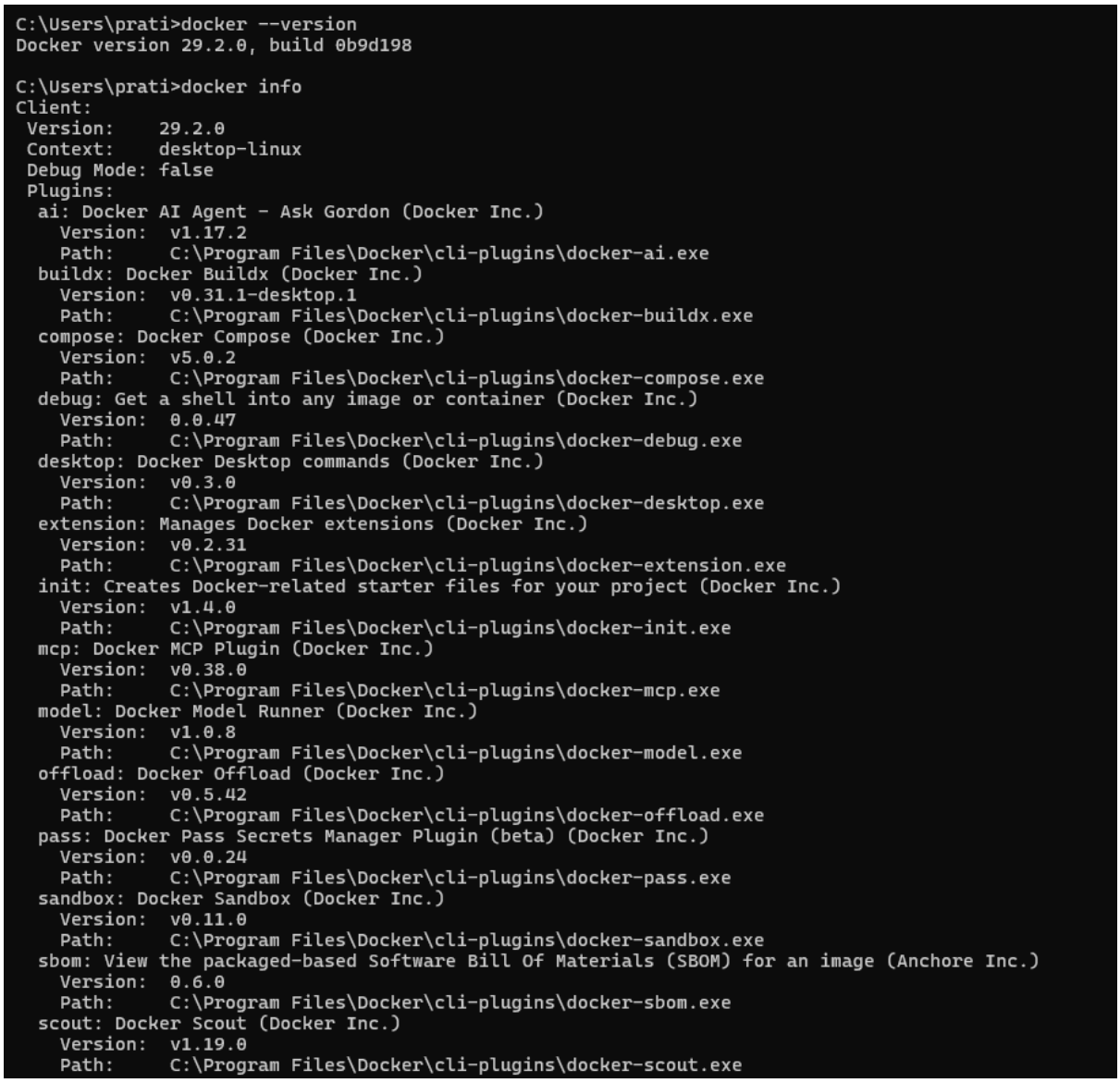
2. Basic Docker Commands

Step 1: Verify Installation

```
docker --version

docker info
```

Expected Output: Docker version and system details.



```
C:\Users\prati>docker --version
Docker version 29.2.0, build 0b9d198

C:\Users\prati>docker info
Client:
 Version:    29.2.0
 Context:    desktop-linux
 Debug Mode: false
 Plugins:
  ai: Docker AI Agent - Ask Gordon (Docker Inc.)
    Version:  v1.17.2
    Path:     C:\Program Files\Docker\cli-plugins\docker-ai.exe
  buildx: Docker Buildx (Docker Inc.)
    Version:  v0.31.1-desktop.1
    Path:     C:\Program Files\Docker\cli-plugins\docker-buildx.exe
  compose: Docker Compose (Docker Inc.)
    Version:  v5.0.2
    Path:     C:\Program Files\Docker\cli-plugins\docker-compose.exe
  debug: Get a shell into any image or container (Docker Inc.)
    Version:  0.0.47
    Path:     C:\Program Files\Docker\cli-plugins\docker-debug.exe
  desktop: Docker Desktop commands (Docker Inc.)
    Version:  v0.3.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-desktop.exe
  extension: Manages Docker extensions (Docker Inc.)
    Version:  v0.2.31
    Path:     C:\Program Files\Docker\cli-plugins\docker-extension.exe
  init: Creates Docker-related starter files for your project (Docker Inc.)
    Version:  v1.4.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-init.exe
  mcp: Docker MCP Plugin (Docker Inc.)
    Version:  v0.38.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-mcp.exe
  model: Docker Model Runner (Docker Inc.)
    Version:  v1.0.8
    Path:     C:\Program Files\Docker\cli-plugins\docker-model.exe
  offload: Docker Offload (Docker Inc.)
    Version:  v0.5.42
    Path:     C:\Program Files\Docker\cli-plugins\docker-offload.exe
  pass: Docker Pass Secrets Manager Plugin (beta) (Docker Inc.)
    Version:  v0.0.24
    Path:     C:\Program Files\Docker\cli-plugins\docker-pass.exe
  sandbox: Docker Sandbox (Docker Inc.)
    Version:  v0.11.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-sandbox.exe
  sbom: View the packaged-based Software Bill Of Materials (SBOM) for an image (Anchore Inc.)
    Version:  0.6.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-sbom.exe
  scout: Docker Scout (Docker Inc.)
    Version:  v1.19.0
    Path:     C:\Program Files\Docker\cli-plugins\docker-scout.exe
```

```
Server:
 Containers: 36
  Running: 36
  Paused: 0
  Stopped: 0
 Images: 11
 Server Version: 29.2.0
 Storage Driver: overlayfs
  driver-type: io.containerd.snapshotter.v1
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
 Cgroup Version: 2
 Plugins:
  Volume: local
  Network: bridge host ipvlan macvlan null overlay
  Log: awslogs fluentd gcplogs gelf journald json-file local splunk syslog
 CDI spec directories:
  /etc/cdi
  /var/run/cdi
 Discovered Devices:
  cdi: docker.com/gpu=webgpu
 Swarm: inactive
 Runtimes: io.containerd.runc.v2 nvidia runc
 Default Runtime: runc
 Init Binary: docker-init
 containerd version: dea7da592f5d1d2b7755e3a161be07f43fad8f75
 runc version: v1.3.4-0-gd6d73eb8
 init version: de40ad0
 Security Options:
  seccomp
   Profile: builtin
  cgroupns
 Kernel Version: 6.6.87.2-microsoft-standard-WSL2
 Operating System: Docker Desktop
 OSType: linux
 Architecture: x86_64
 CPUs: 16
 Total Memory: 7.57GiB
 Name: docker-desktop
 ID: 6f6370a1-4882-4257-89cb-9a5a1aaf4cdb
 Docker Root Dir: /var/lib/docker
 Debug Mode: false
 HTTP Proxy: http.docker.internal:3128
 HTTPS Proxy: http.docker.internal:3128
 No Proxy: hubproxy.docker.internal
 Labels:
  com.docker.desktop.address=npipe://\\.\pipe\docker_cli
 Experimental: false
 Insecure Registries:
  hubproxy.docker.internal:5555
  ::1/128
  127.0.0.0/8
 Live Restore Enabled: false
 Firewall Backend: iptables
```

Step 2: Pull an Image from Docker Hub

```
docker pull ubuntu:latest
```

Explanation: Downloads the latest Ubuntu image from Docker Hub.

```
C:\Users\prati>docker pull ubuntu:latest
latest: Pulling from library/ubuntu
a3629ac5b9f4: Pull complete
1baf05536e37: Download complete
Digest: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

Check available images:

```
docker images
```

```
C:\Users\prati>docker images
                                                                                                          i Info →   U In Use
IMAGE                                                                                      ID             DISK USAGE   CONTENT SIZE   EXTRA
docker/desktop-kubernetes:kubernetes-v1.34.1-cni-v1.7.1-critools-v1.33.0-cri-dockerd-v0.3.20-1-debian   12d6673564e0   592MB   185MB
docker/desktop-storage-provisioner:v3.0                                                    57d2b6ad1c6f   80.3MB   23.9MB   U
docker/desktop-vpnkit-controller:v4.0                                                      bdaff3408b1c   52.6MB   11.9MB   U
registry.k8s.io/coredns/coredns:v1.12.1                                                    e8c262566636   101MB    22.4MB   U
registry.k8s.io/etcd:3.6.4-0                                                               e36c08168342   273MB    74.3MB   U
registry.k8s.io/kube-apiserver:v1.34.1                                                     b9d7c117f8ac   118MB    27.1MB   U
registry.k8s.io/kube-controller-manager:v1.34.1                                            2bf47c1b01f5   101MB    22.8MB   U
registry.k8s.io/kube-proxy:v1.34.1                                                         913cc83ca0b5   102MB    26MB     U
registry.k8s.io/kube-scheduler:v1.34.1                                                     6e9fbc4e25a5   73.5MB   17.4MB   U
registry.k8s.io/pause:3.10                                                                 ee6521f290b2   1.06MB   318kB    U
registry.k8s.io/pause:3.10.1                                                               278fb9dbcca9   1.06MB   318kB
ubuntu:latest                                                                              cd1dba651b30   119MB    31.7MB
```

Step 3: List Containers

- Show running containers:

```
docker ps
```

- Show all containers (including stopped):

```
docker ps -a
```

```
C:\Users\prati>docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED         STATUS                            PORTS     NAMES
a87558493035   ubuntu    "bash"    2 minutes ago   Exited (130) About a minute ago             myubuntu
```

Step 5: Start / Stop / Remove Containers

```
# Start a stopped container

docker start <container_id>

# Stop a running container

docker stop <container_id>

# Remove a container

docker rm <container_id>
```

Tip: Use docker ps -a to get container IDs.

```
C:\Users\prati>docker start a87558493035
a87558493035

C:\Users\prati>docker stop a87558493035
a87558493035

C:\Users\prati>docker rm a87558493035
a87558493035
```

Step 6: Remove Images

```
docker rmi ubuntu:latest
```

Note: You must stop and remove all containers using that image first.

```
C:\Users\prati>docker rmi ubuntu:latest
Untagged: ubuntu:latest
Deleted: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
```
