

1. **Docker installation:** Install Docker on your local system (Windows, macOS, or Linux). Verify the installation by running the `docker --version` and `docker info` commands.

```
root@DESKTOP-PDOJQQA:~# docker --version
```

```
Docker version 24.0.7, build afdd53b
```

```
root@DESKTOP-PDOJQQA:~# docker info
```

```
Client: Docker Engine - Community
```

```
Version: 24.0.7
```

```
Context: default
```

```
Debug Mode: false
```

```
Plugins:
```

```
buildx: Docker Buildx (Docker Inc.)
```

```
Version: v0.11.2
```

```
Path: /usr/libexec/docker/cli-plugins/docker-buildx
```

```
compose: Docker Compose (Docker Inc.)
```

```
Version: v2.21.0
```

```
Path: /usr/libexec/docker/cli-plugins/docker-compose
```

```
Server:
```

```
Containers: 0
```

```
Running: 0
```

```
Paused: 0
```

```
Stopped: 0
```

```
Images: 0
```

```
Server Version: 24.0.7
```

```
Storage Driver: overlay2
```

```
Backing Filesystem: extfs
```

```
Supports d_type: true
```

```
Using metacopy: false
```

```
Native Overlay Diff: true
```

```
userxattr: false
```

```
Logging Driver: json-file
```

```
Cgroup Driver: cgroupfs
```

```
Cgroup Version: 1
```

```
Plugins:
```

```
Volume: local
```

```
Network: bridge host ipvlan macvlan null overlay
```

```
Log: awslogs fluentd gcplogs gelf journald json-file local logentries splunk syslog
```

```
Swarm: inactive
```

```
Runtimes: io.containerd.runc.v2 runc
```

```
Default Runtime: runc
```

```
Init Binary: docker-init
```

```
containerd version: 3dd1e886e55dd695541fdcd67420c2888645a495
```

```
runc version: v1.1.10-0-g18a0cb0
```

init version: de40ad0  
Security Options:  
  seccomp  
  Profile: builtin  
Kernel Version: 5.15.133.1-microsoft-standard-WSL2  
Operating System: Ubuntu 22.04.3 LTS  
OSType: linux  
Architecture: x86\_64  
CPUs: 4  
Total Memory: 3.778GiB  
Name: DESKTOP-PDOJQQA  
ID: 8c54d210-c21f-412f-9b0f-1b09c6d1d2b4  
Docker Root Dir: /var/lib/docker  
Debug Mode: false  
Experimental: false  
Insecure Registries:  
  127.0.0.0/8  
Live Restore Enabled: false

WARNING: No blkio throttle.read\_bps\_device support  
WARNING: No blkio throttle.write\_bps\_device support  
WARNING: No blkio throttle.read\_iops\_device support  
WARNING: No blkio throttle.write\_iops\_device support

2. **Working with Docker images:** Search for the official Ubuntu image on Docker Hub, pull it to your local system using `docker pull`, and list all available images on your system using `docker images`.

```
root@DESKTOP-PDOJQQA:~# docker search ubuntu
```

NAME	DESCRIPTION	STARS	OFFICIAL	AUTOMATED
ubuntu	Ubuntu is a Debian-based Linux operating sys...	16753		[OK]
websphere-liberty	WebSphere Liberty multi-architecture images ...	296		[OK]

```
root@DESKTOP-PDOJQQA:~# docker pull ubuntu
```

Using default tag: latest

latest: Pulling from library/ubuntu

a48641193673: Pull complete

Digest: sha256:6042500cf4b44023ea1894effe7890666b0c5c7871ed83a97c36c76ae560bb9b

Status: Downloaded newer image for ubuntu:latest

docker.io/library/ubuntu:latest

```
root@DESKTOP-PDOJQQA:~# docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
ubuntu	latest	174c8c134b2a	3 weeks ago	77.9MB

3. **Creating a Docker container:** Run a Docker container using the Ubuntu image, and execute a command inside the container (e.g., echo "Hello, Docker!").

```
root@DESKTOP-PDOJQQA:~# docker run ubuntu bash -c "echo Hello, Docker!"
Hello, Docker!
```

4. Inspect the Ubuntu Docker container to ensure it is in the "created" state only.

```
root@DESKTOP-PDOJQQA:~# docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
8b59e2312fbf	ubuntu	"bash -c 'echo Hello..."	35 minutes ago	Exited (0)	35 minutes ago
infallible_poincare					
b1f4178043fa	ubuntu	"/bin/bash"	46 minutes ago	Exited (100)	44 minutes ago
interesting_sammet					

```
root@DESKTOP-PDOJQQA:~# docker inspect 8b59e2312fbf
[
  {
    "Id": "8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87fd603397928",
    "Created": "2024-01-09T08:57:39.444728905Z",
    "Path": "bash",
    "Args": [
      "-c",
      "echo Hello, Docker!"
    ],
    "State": {
      "Status": "exited",
      "Running": false,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 0,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2024-01-09T08:57:39.88495531Z",
      "FinishedAt": "2024-01-09T08:57:39.88854551Z"
    },
    "Image":
      "sha256:174c8c134b2a94b5bb0b37d9a2b6ba0663d82d23ebf62bd51f74a2fd457333da",
    "ResolvConfPath":
      "/var/lib/docker/containers/8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87fd603397928/resolv.conf",
```

```
    "HostnamePath":  
    "/var/lib/docker/containers/8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87  
fd603397928/hostname",  
    "HostsPath":  
    "/var/lib/docker/containers/8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87  
fd603397928/hosts",  
    "LogPath":  
    "/var/lib/docker/containers/8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87  
fd603397928/8b59e2312fbf73dd910bf709dd183cf1bed8818a5bb22a445ec87fd603397928-  
json.log",  
    "Name": "/infallible_poincare",  
    "RestartCount": 0,  
    "Driver": "overlay2",  
    "Platform": "linux",  
    "MountLabel": "",  
    "ProcessLabel": "",  
    "AppArmorProfile": "",  
    "ExecIDs": null,  
    "HostConfig": {  
        "Binds": null,  
        "ContainerIDFile": "",  
        "LogConfig": {  
            "Type": "json-file",  
            "Config": {}  
        },  
        "NetworkMode": "default",  
        "PortBindings": {},  
        "RestartPolicy": {  
            "Name": "no",  
            "MaximumRetryCount": 0  
        },  
        "AutoRemove": false,  
        "VolumeDriver": "",  
        "VolumesFrom": null,  
        "ConsoleSize": [  
            34,  
            133  
        ],  
        "CapAdd": null,  
        "CapDrop": null,  
        "CgroupnsMode": "host",  
        "Dns": [],  
        "DnsOptions": [],  
        "DnsSearch": [],  
        "ExtraHosts": null,
```

"GroupAdd": null,  
"IpcMode": "private",  
"Cgroup": "",  
"Links": null,  
"OomScoreAdj": 0,  
"PidMode": "",  
"Privileged": false,  
"PublishAllPorts": false,  
"ReadonlyRootfs": false,  
"SecurityOpt": null,  
"UTSMode": "",  
"UsernsMode": "",  
"ShmSize": 67108864,  
"Runtime": "runc",  
"Isolation": "",  
"CpuShares": 0,  
"Memory": 0,  
"NanoCpus": 0,  
"CgroupParent": "",  
"BlkioWeight": 0,  
"BlkioWeightDevice": [],  
"BlkioDeviceReadBps": [],  
"BlkioDeviceWriteBps": [],  
"BlkioDeviceReadIOps": [],  
"BlkioDeviceWriteIOps": [],  
"CpuPeriod": 0,  
"CpuQuota": 0,  
"CpuRealtimePeriod": 0,  
"CpuRealtimeRuntime": 0,  
"CpusetCpus": "",  
"CpusetMems": "",  
"Devices": [],  
"DeviceCgroupRules": null,  
"DeviceRequests": null,  
"MemoryReservation": 0,  
"MemorySwap": 0,  
"MemorySwappiness": null,  
"OomKillDisable": false,  
"PidsLimit": null,  
"Ulimits": null,  
"CpuCount": 0,  
"CpuPercent": 0,  
"IOMaximumIOps": 0,  
"IOMaximumBandwidth": 0,  
"MaskedPaths": [

```

        "/proc/asound",
        "/proc/acpi",
        "/proc/kcore",
        "/proc/keys",
        "/proc/latency_stats",
        "/proc/timer_list",
        "/proc/timer_stats",
        "/proc/sched_debug",
        "/proc/scsi",
        "/sys/firmware",
        "/sys/devices/virtual/powercap"
    ],
    "ReadOnlyPaths": [
        "/proc/bus",
        "/proc/fs",
        "/proc/irq",
        "/proc/sys",
        "/proc/sysrq-trigger"
    ]
},
"GraphDriver": {
    "Data": {
        "LowerDir":
"/var/lib/docker/overlay2/99b5fe8176c048e4375d61164e0165b245e19941bed9caab9cd8d
ea005ff529e-
init/diff:/var/lib/docker/overlay2/e2a3f7e032ec78d0b855859c1449ee4ef04e8f2e0490902f0
8c72b5cf6ae7c75/diff",
        "MergedDir":
"/var/lib/docker/overlay2/99b5fe8176c048e4375d61164e0165b245e19941bed9caab9cd8d
ea005ff529e/merged",
        "UpperDir":
"/var/lib/docker/overlay2/99b5fe8176c048e4375d61164e0165b245e19941bed9caab9cd8d
ea005ff529e/diff",
        "WorkDir":
"/var/lib/docker/overlay2/99b5fe8176c048e4375d61164e0165b245e19941bed9caab9cd8d
ea005ff529e/work"
    },
    "Name": "overlay2"
},
"Mounts": [],
"Config": {
    "Hostname": "8b59e2312fbf",
    "Domainname": "",
    "User": "",
    "AttachStdin": false,

```

```
"AttachStdout": true,
"AttachStderr": true,
"Tty": false,
"OpenStdin": false,
"StdinOnce": false,
"Env": [
  "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
],
"Cmd": [
  "bash",
  "-c",
  "echo Hello, Docker!"
],
"Image": "ubuntu",
"Volumes": null,
"WorkingDir": "",
"Entrypoint": null,
"OnBuild": null,
"Labels": {
  "org.opencontainers.image.ref.name": "ubuntu",
  "org.opencontainers.image.version": "22.04"
}
},
"NetworkSettings": {
  "Bridge": "",
  "SandboxID":
"2d6e623f51c7973073266a1bde42df2206a52a47a482c5a8f9f3596691fdeb14",
  "HairpinMode": false,
  "LinkLocalIPv6Address": "",
  "LinkLocalIPv6PrefixLen": 0,
  "Ports": {},
  "SandboxKey": "/var/run/docker/netns/2d6e623f51c7",
  "SecondaryIPAddresses": null,
  "SecondaryIPv6Addresses": null,
  "EndpointID": "",
  "Gateway": "",
  "GlobalIPv6Address": "",
  "GlobalIPv6PrefixLen": 0,
  "IPAddress": "",
  "IPPrefixLen": 0,
  "IPv6Gateway": "",
  "MacAddress": "",
  "Networks": {
    "bridge": {
      "IPAMConfig": null,
```

```

        "Links": null,
        "Aliases": null,
        "NetworkID":
"80451033241a3278a0e1640b94e0eb4392faa0a573422ee2cc6232dbaaa1d451",
        "EndpointID": "",
        "Gateway": "",
        "IPAddress": "",
        "IPPrefixLen": 0,
        "IPv6Gateway": "",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "MacAddress": "",
        "DriverOpts": null
    }
}
}
}
]

```

root@DESKTOP-PDOJQQA:~# **docker inspect 063b00bacf9a**

```

[
  {
    "Id": "063b00bacf9aae1c0968b87e33a7806853384f17ddfe596ec3715744829a324a",
    "Created": "2024-01-09T09:45:10.496771532Z",
    "Path": "vivek",
    "Args": [],
    "State": {
      "Status": "created",
      "Running": false,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 0,
      "ExitCode": 127,
      "Error": "failed to create task for container: failed to create shim task: OCI runtime
create failed: runc create failed: unable to start container process: exec: \"vivek\":
executable file not found in $PATH: unknown",
      "StartedAt": "0001-01-01T00:00:00Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    },
  },
]

```



5. Execute the Ubuntu Docker container and confirm that the container's state is "running."

```
root@DESKTOP-PDOJQQA:~# docker container run -itd --name cloudeithix ubuntu
732c8b252cdc2ce421372db2c7fdb537ef2400ea5efdf3cdcc509032177ae7d6
```

```
root@DESKTOP-PDOJQQA:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
732c8b252cdc	ubuntu	"/bin/bash"	7 seconds ago	Up 6 seconds
073d6137c9bf	ubuntu	"/bin/bash"	5 minutes ago	Exited (127) 2 minutes ago

```
root@DESKTOP-PDOJQQA:~# docker inspect 732c8b252cdc
```

```
[
  {
    "Id": "732c8b252cdc2ce421372db2c7fdb537ef2400ea5efdf3cdcc509032177ae7d6",
    "Created": "2024-01-09T09:55:08.18344706Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 3645,
      "ExitCode": 0,
```

6. Launch an HTTP container, verify its state, and then remove the container and image from your local system.

```
root@DESKTOP-PDOJQQA:~# docker container create httpd
```

```
Unable to find image 'httpd:latest' locally
```

```
latest: Pulling from library/httpd
```

```
af107e978371: Pull complete
```

```
eba4da411ea0: Pull complete
```

```
4f4fb700ef54: Pull complete
```

```
ed4d6291a6c2: Pull complete
```

```
b42c390e1de9: Pull complete
```

```
eafe388a0bb8: Pull complete
```

```
Digest: sha256:f0a93744d8006e6f7ee5086c9ddccdcfa33d1091f15269a00547b4c382459c1f
```

```
Status: Downloaded newer image for httpd:latest
```

```
root@DESKTOP-PDOJQQA:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
6467eccd7c11	httpd	"httpd-foreground"	3 minutes ago	Created
admiring_roentgen				
732c8b252cdc	ubuntu	"/bin/bash"	7 minutes ago	Up 7 minutes
cloudethix				
073d6137c9bf	ubuntu	"/bin/bash"	13 minutes ago	Exited (127) 10 minutes ago
quirky_thompson				

```
root@DESKTOP-PDOJQQA:~# docker container start 6467eccd7c11
```

```
6467eccd7c11
```

```
root@DESKTOP-PDOJQQA:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
6467eccd7c11	httpd	"httpd-foreground"	7 minutes ago	Up 2 minutes
80/tcp	admiring_roentgen			
732c8b252cdc	ubuntu	"/bin/bash"	11 minutes ago	Up 11 minutes
cloudethix				
073d6137c9bf	ubuntu	"/bin/bash"	16 minutes ago	Exited (127) 14 minutes ago
quirky_thompson				

```
root@DESKTOP-PDOJQQA:~# docker rm 6467eccd7c11-----remove
```

```
6467eccd7c11
```

```
root@DESKTOP-PDOJQQA:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
732c8b252cdc	ubuntu	"/bin/bash"	15 minutes ago	Up 15 minutes
cloudethix				
073d6137c9bf	ubuntu	"/bin/bash"	21 minutes ago	Exited (127) 18 minutes ago
quirky_thompson				
063b00bacf9a	ubuntu	"vivek"	25 minutes ago	Created
crazy_northcutt				
d0a42889ebb4	ubuntu	"/bin/bash"	29 minutes ago	Exited (127) 27 minutes ago
kind_edison				
8b59e2312fbf	ubuntu	"bash -c 'echo Hello...'"	About an hour ago	Exited (0) About an hour ago
infallible_poincare				
b1f4178043fa	ubuntu	"/bin/bash"	About an hour ago	Exited (100) About an hour ago
interesting_sammet				

7. Execute a command to display a filtered list of containers, showing only their short container IDs.

```
root@DESKTOP-PDOJQQA:~# docker ps --filter "status=exited"
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
073d6137c9bf	ubuntu	"/bin/bash"	23 minutes ago	Exited (127) 20 minutes ago
d0a42889ebb4	ubuntu	"/bin/bash"	31 minutes ago	Exited (127) 30 minutes ago
8b59e2312fbf	ubuntu	"bash -c 'echo Hello...'"	About an hour ago	Exited (0) About an hour ago
b1f4178043fa	ubuntu	"/bin/bash"	About an hour ago	Exited (100) About an hour ago

```
root@DESKTOP-PDOJQQA:~# docker ps --filter "status=created"
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
a063d81be942	httpd	"httpd-foreground"	About a minute ago	Created		suspicious_villani
063b00bacf9a	ubuntu	"vivek"	29 minutes ago	Created		crazy_northcutt