Docker

1. What is docker ?

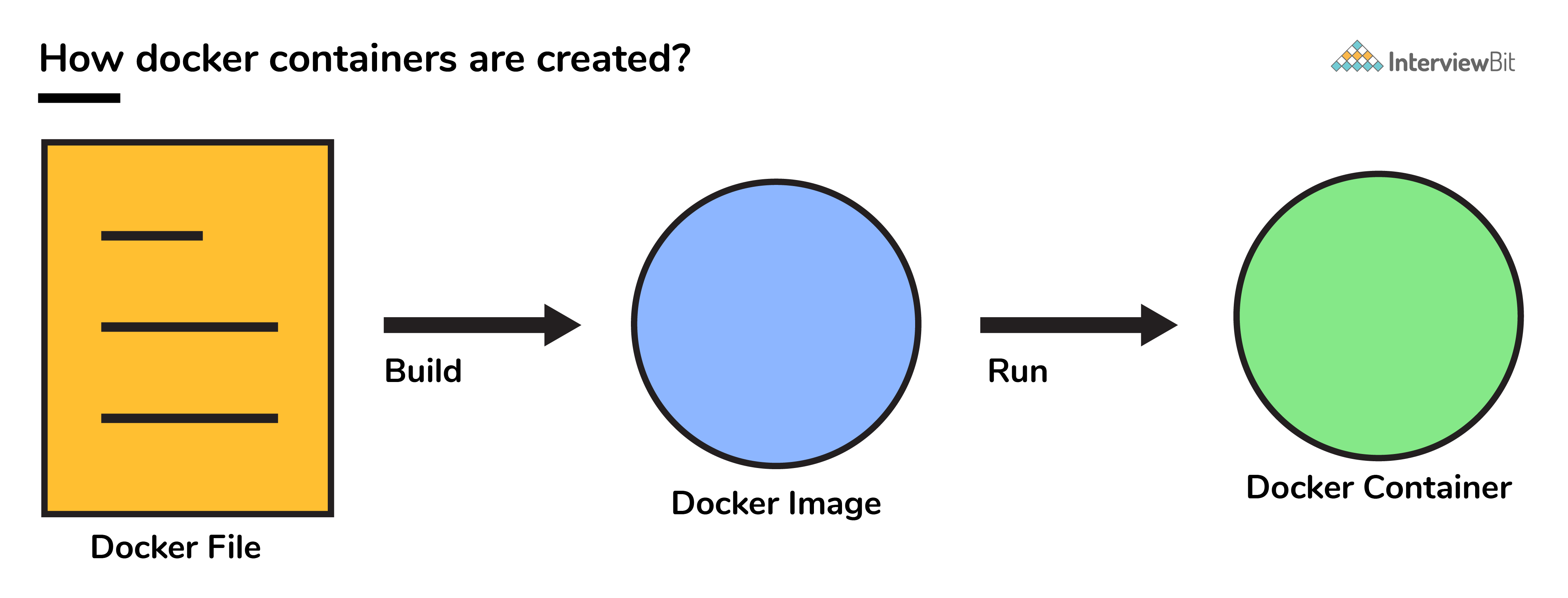
* Docker is an open-source containerization platform. It is used to automate the deployment of any application, using lightweight, portable containers.

1. What are docker images?

* They are executable packages(bundled with application code & dependencies, software packages, etc.) for the purpose of creating containers. Docker images can be deployed to any docker environment and the containers can be spun up there to run the application.

1. What is a DockerFile?

* It is a text file that has all commands which need to be run for building a given image.



1. What is the docker command that lists the status of all docker containers?

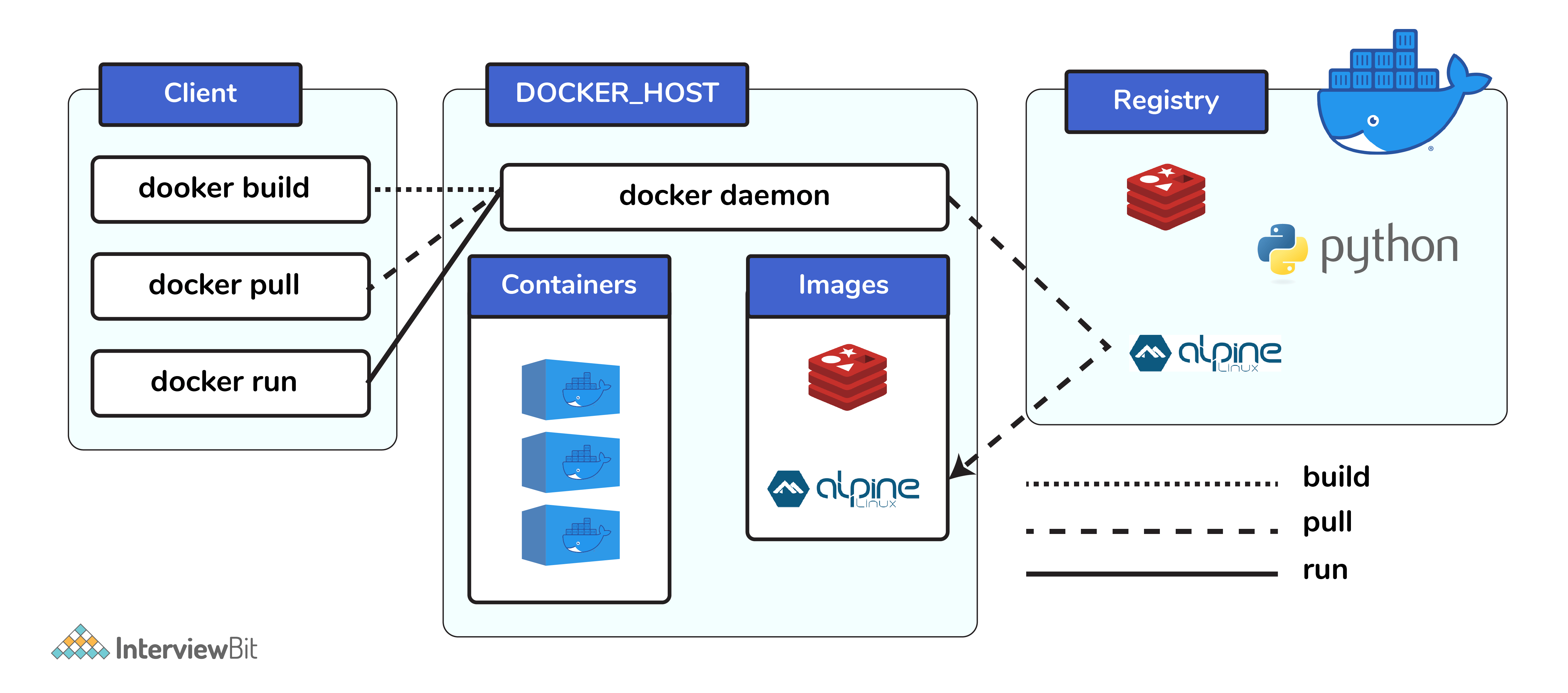
* In order to get the status of all the containers, we run the below command: docker ps -a

1. On what circumstances will you lose data stored in a container?

* The data of a container remains in it until and unless you delete the container.

1. How many Docker components are there?

* There are three docker components, they are - Docker Client, Docker Host, and Docker Registry.
* Docker Client: This component performs “build” and “run” operations for the purpose of opening communication with the docker host.
* Docker Host: This component has the main docker daemon and hosts containers and their associated images. The daemon establishes a connection with the docker registry.
* Docker Registry: This component stores the docker images. There can be a public registry or a private one. The most famous public registries are Docker Hub and Docker Cloud.



1. What is a Docker Hub?

* - It is a public cloud-based registry provided by Docker for storing public images of the containers along with the provision of finding and sharing them.
* The images can be pushed to Docker Hub through the docker push command.

1. What command can you run to export a docker image as an archive?

* This can be done using the docker save command and the syntax is: docker save -o <exported\_name>.tar <container-name>

1. What command can be run to import a pre-exported Docker image into another Docker host?

* This can be done using the docker load command and the syntax is docker load -i <export\_image\_name>.tar

1. Can a paused container be removed from Docker?

* No, it is not possible! A container MUST be in the stopped state before we can remove it.

1. What command is used to check for the version of docker client and server?

* - The command used to get all version information of the client and server is the docker version.
* To get only the server version details, we can run docker version --format '{{.Server.Version}}'

Intermediate Interview Questions

1. Differentiate between virtualization and containerization.

| **Virtualization** | **Containerization** |
| --- | --- |
| This helps developers to run and host multiple **OS** on the hardware of a single physical server. | This helps developers to deploy multiple **applications** using the same operating system on a single virtual machine or server. |
| **Hypervisors** provide overall virtual machines to the guest operating systems. | **Containers** ensure isolated environment/ user spaces are provided for running the applications. Any changes done within the container do not reflect on the host or other containers of the same host. |
| These virtual machines form an **abstraction of the system hardware** **layer**this means that each virtual machine on the host acts like a physical machine. | Containers form **abstraction of the application** **layer** which means that each container constitutes a different application. |

1. Where are docker volumes stored in docker?

* Volumes are created and managed by Docker and cannot be accessed by non-docker entities. They are stored in Docker host filesystem at /var/lib/docker/volumes/

1. Can you tell the approach to login to the docker registry?

* Using the docker login command credentials to log in to their own cloud repositories can be entered and accessed.

1. What is the way to establish communication between docker host and Linux host?

* This can be done using networking by identifying the “ipconfig” on the docker host. This command ensures that an ethernet adapter is created as long as the docker is present in the host.

1. What is the best way of deleting a container?

* We need to follow the following two steps for deleting a container:

- docker stop <container\_id>

- docker rm <container\_id>

Advanced Interview Questions

1. Can we use JSON instead of YAML while developing docker-compose file in Docker?

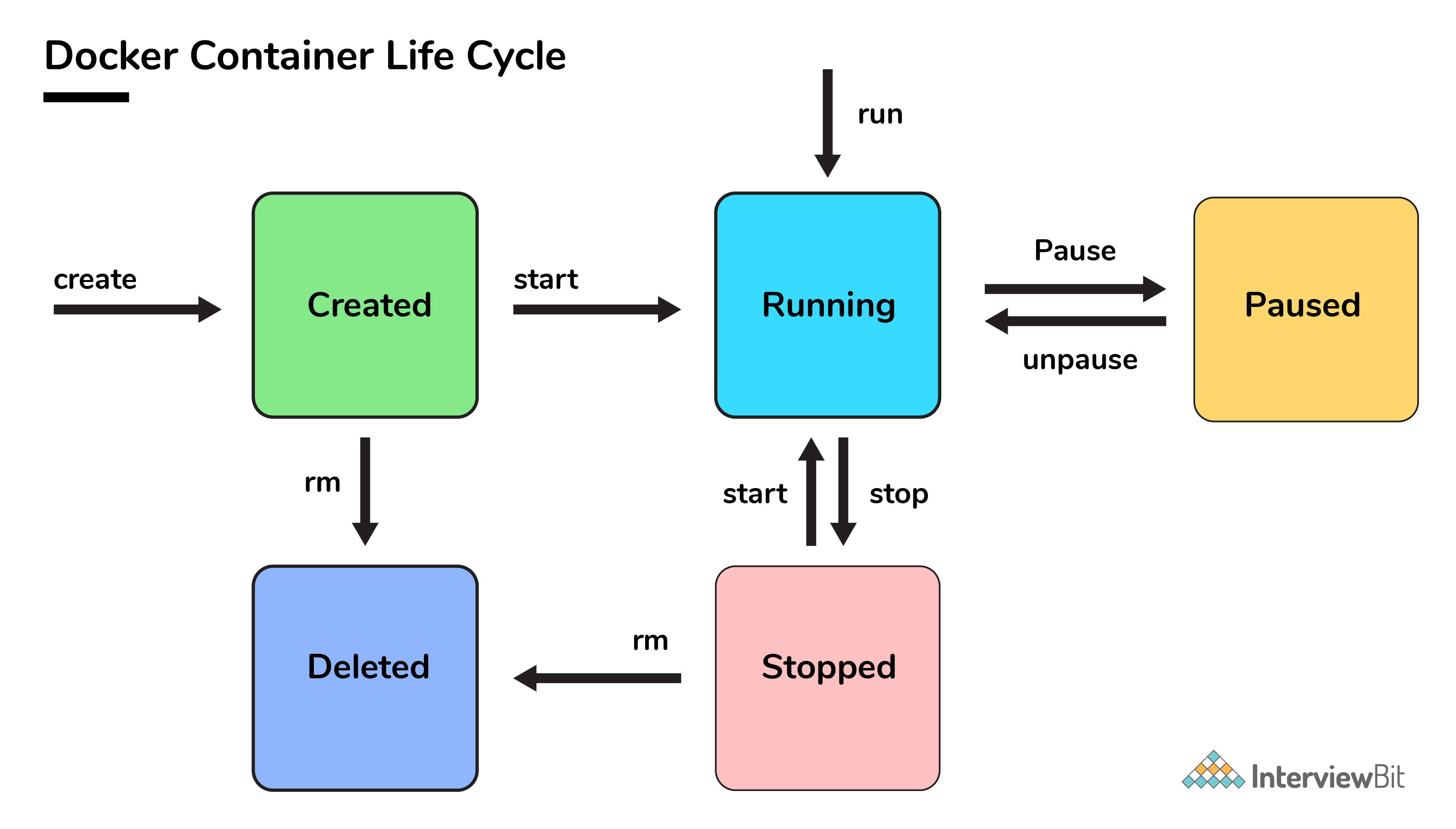
* Yes! It can be used. In order to run docker-compose with JSON, docker-compose -f docker-compose.json up can be used.

1. Describe the lifecycle of Docker Container?

* The different stages of the docker container from the start of creating it to its end are called the docker container life cycle.

The most important stages are:

* Created: This is the state where the container has just been created new but not started yet.
* Running: In this state, the container would be running with all its associated processes.
* Paused: This state happens when the running container has been paused.
* Stopped: This state happens when the running container has been stopped.
* Deleted: In this, the container is in a dead state.



1. What are Docker’s most notable features?

* Docker’s most essential features include:
* Application agility
* Developer productivity
* Easy modeling
* Operational efficiencies
* Placement and affinity
* Version control

1. Why should anyone use Docker? What does it offer?

* Docker gives users many incentives for adoption, such as:
* An efficient and easy initial set up experience
* The means to describe an application lifecycle in detail
* Simple configuration and smooth interaction with Docker Compose
* Complete and well-detailed documentation
* Ability to run on a PC or enterprise IT system with equal ease

1. What about the opposite? Does Docker have any downsides?

* Docker isn’t perfect. It comes with its share of drawbacks, including:
* Lacks a storage option
* Monitoring options are less than ideal
* You can’t automatically reschedule inactive nodes
* Automatic horizontal scaling set up is complicated

1. What is a container?

* Containers are deployed applications bundled with all necessary dependencies and configuration files. All of the elements share the same OS kernel. Since the container isn’t tied to any one IT infrastructure, it can run on a different system or the cloud.

1. Explain virtualization.

* Virtualization is the means of employing software (such as Hypervisor) to create a virtual version of a resource such as a server, data storage, or application. Virtualization lets you divide a system into a series of separate sections, each one acting as a distinct individual system. The virtual environment is called a virtual machine.

1. Name the essential Docker commands and what they do

* The most critical Docker commands are:
* Build. Builds a Docker image file
* Commit. Creates a new image from container changes
* Create. Creates a new container
* Dockerd. Launches Docker daemon
* Kill. Kills a container

1. What are Docker object labels?

* Labels are the mechanism for applying metadata to Docker objects such as containers, images, local daemons, networks, volumes, and nodes.

1. Show how you would create a container from an image.

* To create a container, you pull an image from the Docker repository and run it using the following command: $ docker run -it -d <image\_name>

1. How about a command to stop the container?

* Use the following command: $ sudo docker stop container name

1. What’s involved in scaling a Docker container?

* Docker containers have the potential to be scaled to any level needed. Thanks to the platform’s flexibility, you can have anything from a few hundred to a few thousand, to millions of containers, providing they all have continual, unconstrained access to the required memory and OS.

1. What do you know about the Docker system prune?

* It’s a command used to remove all stopped containers, unused networks, build caches, and dangling images. Prune is one of the most useful commands in Docker. The syntax is: $ docker system prune

1. List some of the more advanced Docker commands and what they do

* Some advanced commands include:
* Docker info. Displays system-wide information regarding the Docker installation
* Docker pull. Downloads an image
* Docker stats. Provides you with container information
* Docker images. Lists downloaded images

1. Can you lose data stored in a container?

* Any data stored in a container remains there unless you delete the container.

1. What platforms can you run Docker on?

* The Linux platforms are:

ArchLinux

CentOS 6+

CRUX 3.0+

Fedora 19/20+

Gentoo

openSUSE 12.3+

RHEL 6.5+

Ubuntu 12.04, 13.04 et al

* Docker can also run on the following cloud-based platforms:

Amazon EC2

Amazon ECS

Google Compute Engine

Microsoft Azure

Rackspace

1. Can a container restart on its own?

* Since the default flag -reset is set to false, a container cannot restart by itself.

1. How do Docker daemon and the Docker client communicate with each other?

* You use a combination of Rest API, socket.IO, and TCP to facilitate communication.

1. Can you implement continuous development (CD) and continuous integration (CI) in Docker?

* Yes, you can. You can run Jenkins on Docker and use Docker Compose to run integration tests.

1. Finally, how do you create a Docker swarm?

* Use the following command: docker swarm init –advertise-addr <manager IP>

1. What is docker newtworking and tell various types of network in docker?

* Docker networking allows you to attach a container to as many networks as you like.

There are three common Docker network types –

* bridge networks
* overlay networks
* macvlan networks

1. What is default network in docker ?

* When Docker is installed, a default bridge network named docker0 is created

1. How one containetr talks with other container

* If you are running more than one container, you can let your containers communicate with each other by attaching them to the same network. Docker creates virtual networks which let your containers talk to each other.

1. What is docker swarm ?

* Docker swarm is a container orchestration tool ?

1. What is difference between ADD/COPY , CMD/ENTRYPOINT,RUN/CMD

* They both specify programs that execute when the container starts running, but: CMD commands are ignored by Daemon when there are parameters stated within the docker run command. ENTRYPOINT instructions are not ignored

1. Tell the docker file best practices ?

* Create ephemeral containers
* Understand build context
* Pipe Dockerfile through
* Build an image using a Dockerfile from stdin, without sending build context
* Build from a local build context, using a Dockerfile from stdin
* Build from a remote build context, using a Dockerfile from stdin
* Exclude with .dockerignore
* Use multi-stage builds
* Don’t install unnecessary packages
* Decouple applications
* Minimize the number of layers
* Sort multi-line arguments

1. How to reduce a docker file size

* The following are the methods by which we can achieve docker image optimization.
* Using distroless/minimal base images
* Multistage builds
* Minimizing the number of layers
* Understanding caching
* Using Dockerignore
* Keeping application data elsewhere

1. How to store the docker file in jfrog/dockerhub

* 1. First create a docker image from dockerfile.

2. create a container from docker image.

3. push image into docker hub

4. your image will be stored in docker hub.

1. How to create a docker image if no internet connectivity is there?

* For creating docker image in offline mode you must have docker installed in your local desktop. Than you can create image without server

For example:- docker run hello-world

1. Write a docker file and state various layers and use the depends\_on concept ?

* services:

db:

image: postgres:latest

environment:

- POSTGRES\_USER=postgres

- POSTGRES\_PASSWORD=postgres

ports:

- 5432:5432

web-app:

image: web-app:latest

ports:

- 8080:8080

depends\_on:

- db

1. How to save a container as image and then as a zip file ?

* docker save myimage:latest | gzip > myimage\_latest.tar.gz

1. What are docker volumes

* Docker volumes are file systems mounted on Docker containers to preserve data generated by the running container.