Docker Question and Answers

**What is Hypervisor?**Hypervisor is software enabling virtualization, creating virtual environments on a single host system. Two types: Type 1 (directly on hardware), Type 2 (uses host operating system).

**What is Containerization?**Containerization bundles applications, dependencies, and configurations into containers. It solves compatibility issues when deploying software on different machines.

**Difference between Virtualization and Containerization:**Containers provide isolated environments for applications, while virtualization uses hypervisors to create full virtual machines. Containers are more lightweight, efficient, and share the host OS, while VMs mimic entire systems.

**What is Docker?**Docker is a containerization platform that packages applications and dependencies into containers. It solves compatibility issues when deploying software on different machines.

**What are Docker Images?**Docker images are the source of Docker containers. They contain application code, runtime, libraries, and other essential components.

**What is Docker Hub?**Docker Hub is a registry for Docker images, acting as a repository where users can share and access pre-built Docker images. It allows users to pull images for use in their own containerized applications.

**What is a Dockerfile?**A Dockerfile is a text document containing instructions for building a Docker image.

**Tell us something about Docker Compose:**Docker Compose is a YAML file specifying services, networks, and volumes for a Docker application. It allows defining a multi-container application, making it easy to manage and deploy complex setups.

**What is the lifecycle of a Docker Container?**Docker containers go through stages like creation, running, pausing (optional), unpausing (optional), starting, stopping, restarting, killing, and destruction.

**How do you get the number of containers running, paused, and stopped?**Use the command **docker info** to get detailed information, including the number of running, paused, and stopped containers.

**If you vaguely remember the command and you’d like to confirm it, how will you get help on that particular command?**Use the command **docker --help** to get help on all Docker commands. For specific commands, use **docker <command> --help**.

**If you wish to use a base image and make modifications or personalize it, how do you do that?**Use the command **docker pull <image\_name>** to pull a base image, and then use **docker run -it -d <image\_name>** to create a container and make modifications.

**How do you list all the running containers?**Use the command **docker ps** to list all running containers.

**Suppose you have 3 containers running, and out of these, you wish to access one of them. How do you access a running container?**Use the command **docker exec -it <container\_id> bash** to access a running container.

**How to start, stop, and kill a container?**Use **docker start <container\_id>** to start, **docker stop <container\_id>** to stop, and **docker kill <container\_id>** to kill a container.

**Can you use a container, edit it, and update it? Also, how do you make it a new and store it on the local system?**Yes, use the command **docker commit <container\_id> <username/imagename>** to create a new image with changes.

**Once you’ve worked with an image, how do you push it to Docker Hub?**Use the command **docker push <username/image\_name>** to push the image to Docker Hub.

**How to delete a stopped container?**Use the command **docker rm <container\_id>** to delete a stopped container.

**How to delete an image from the local storage system?**Use the command **docker rmi <image\_id>** to delete an image

**How to build a Dockerfile?**Use the command **docker build <path to docker file>** to build an image from a Dockerfile.

**Do you know why docker system prune is used? What does it do?  
docker system prune** is used to remove all stopped containers, unused networks, dangling images, and build caches, freeing up space.

**What is Docker Swarm?**Docker Swarm is native clustering for Docker, turning a pool of Docker hosts into a single virtual Docker host. It provides high availability and scales applications transparently.

**If you wish to use a base image and make modifications or personalize it, how do you do that?**Use the command **docker pull <image\_name>** to pull a base image, and then employ **docker run -it -d <image\_name>** to create a container and make modifications.

**How do you manage environment variables in Docker containers?**Environment variables can be passed into Docker containers using the -e flag or an .env file for dynamic configuration.

****What are Docker networks, and how can they be configured?****Docker networks allow containers to communicate with each other, and you can configure networks like bridge, overlay, or host.

****How can you optimize Docker images for faster build times and smaller sizes?****Optimizing Docker images involves minimizing the number of layers, using multi-stage builds, and cleaning up intermediate files.

****How do you handle multi-stage builds in Docker?****Multi-stage builds enable creating smaller, optimized images by using multiple FROM statements to reduce unnecessary dependencies.

****What are the best practices for securing Docker containers?****Best practices for securing Docker include using official images, setting resource limits, using user namespaces, and avoiding running containers as root.

****Explain the difference between** docker run **and** docker exec**.****docker run creates and starts a new container, while docker exec runs commands inside an existing container.

****What is the purpose of the** .dockerignore **file?****The .dockerignore file prevents specific files and directories from being included in the Docker image build context.

****Explain the concept of image tagging in Docker.****Image tagging assigns versions or identifiers to images (e.g., latest, v1.0) to distinguish between different builds of the same application.

****How do you update a running Docker container?****You can update a container by stopping it and running a new one with updated configurations or by using docker service update in Swarm.

****What is the role of Docker's** ENTRYPOINT **and** CMD **instructions?****ENTRYPOINT specifies the main command to run inside a container, while CMD provides default arguments for that command.

**Are you aware of load balancing across containers and hosts? How does it work?**Load balancing across containers and hosts is achieved using tools like HAProxy. It distributes incoming traffic among available containers, ensuring high availability and fault tolerance.