Docker & Nginx Interview Questions

End-to-End Interview Preparation
Based on Real-World Docker Port Mapping & Nginx Deployment Tasks

Prepared as part of a hands-on DevOps learning journey

1. What image did you use to deploy the Nginx container and why?

Answer:

I used the nginx:alpine image because it is lightweight, has a smaller attack surface, and results in faster pull and startup times compared to full-based images.

2. How did you expose the Nginx application outside the container?

Answer:

I exposed the application by mapping a host port to the container port using Docker port mapping.

Host port 3001 was mapped to container port 80.

Command used:

```
docker run -d --name media -p 3001:80 nginx:alpine
```

3. What does the -p 3001:80 option do in Docker?

Answer:

It maps port 3001 on the Docker host to port 80 inside the container, allowing external access to the containerized application via the host IP and port 3001.

4. Why did you run the container in detached mode?

Answer:

Detached mode (-d) allows the container to run in the background, which is required for long-running services like web servers without blocking the terminal.

5. How did you verify that the container was running successfully?

Answer:

I used the docker ps command to verify the container status and port mapping.

```
docker ps | grep media
```

This confirmed that the container was in Up state and ports were correctly mapped.

6. How do you check if Docker is installed and running on a server?

Answer:

To check installation:

```
docker --version
```

To check Docker service status:

```
sudo systemctl status docker
```

7. What is the difference between docker pull and docker run?

Answer:

```
docker pull downloads the image from a registry
```

```
docker run creates and starts a container from the image
```

If the image is not available locally, docker run automatically pulls it.

8. What happens if the mapped host port is already in use?

Answer:

Docker will fail to start the container and return a port binding error.

In that case, either a different host port must be used or the conflicting service must be stopped.

9. How would you access this Nginx application from a browser?

Answer:

By navigating to:

```
http://<host-ip>:3001
```

Since port 3001 is mapped to container port 80, the Nginx default page will load.

10. What is the default port on which Nginx listens inside a container?

Answer:

Nginx listens on port 80 by default inside the container.

11. What command would you use to stop and remove this container?

Answer:

```
docker stop media

docker rm media
```

12. How do you ensure the container name is unique?

Answer:

Docker enforces unique container names.

If a name already exists, Docker will throw an error unless the existing container is removed or renamed.

13. Why is Alpine commonly used in production containers?

Answer:

Small image size

Faster deployment

Reduced vulnerabilities

Lower resource consumption

14. Can multiple containers use the same container port?

Answer:

Yes, multiple containers can use the same container port, but they must be mapped to different host ports.

Example:

```
-p 3001:80

-p 3002:80
```

15. How would you check logs of this Nginx container?

Answer:

```
docker logs media
```

One-Line Interview Summary (Very Useful)

> *"I deployed an Nginx container using the lightweight nginx:alpine image, exposed it via Docker port mapping by mapping host port 3001 to container port 80, verified service availability, and ensured the container remained in a running state."*

■ BASIC / L1 QUESTIONS (Foundational Knowledge)

1. What is Docker?

Answer:

Docker is a containerization platform that allows applications to be packaged with their dependencies and run consistently across different environments.

2. What is a Docker container?

Answer:

A container is a lightweight, isolated runtime environment created from a Docker image that runs an application.

3. What is a Docker image?

Answer:A Docker image is a read-only template used to create containers. It contains the application and required dependencies.

4. What is Nginx?

Answer:

Nginx is a high-performance web server and reverse proxy commonly used to serve static content and load balance applications.

5. What is nginx:alpine?

Answer:

It is an Nginx Docker image based on Alpine Linux, optimized for small size and fast startup.

■ COMMAND-BASED QUESTIONS

6. How do you check Docker version?

```
docker --version
```

7. How do you check Docker service status?

```
sudo systemctl status docker
```

8. How do you pull an image from Docker Hub?

```
docker pull nginx:alpine
```

9. How do you list available images?

```
docker images
```

10. How do you run a container in detached mode?

```
docker run -d nginx:alpine
```

■ PORT MAPPING QUESTIONS (VERY IMPORTANT)

11. What is Docker port mapping?

Answer:

Port mapping allows traffic from a host port to be forwarded to a container port.

12. What does -p 3001:80 mean?

Answer:

It maps host port 3001 to container port 80.

13. Why is port mapping required?

Answer:

Containers run in isolated networks. Port mapping exposes container services to external users.

14. Can two containers use the same host port?

Answer:

No. Host ports must be unique.

15. Can multiple containers use the same container port?

Answer:

Yes, if mapped to different host ports.

■ CONTAINER MANAGEMENT QUESTIONS

16. How do you list running containers?

```
docker ps
```

17. How do you stop a container?

```
docker stop media
```

18. How do you remove a container?

```
docker rm media
```

19. How do you restart a container?

```
docker restart media
```

20. How do you view container logs?

```
docker logs media
```

■ SCENARIO-BASED QUESTIONS

21. What if port 3001 is already in use?

Answer:

Docker will fail with a port binding error.

Solution: Use another port or stop the conflicting service.

22. Container exits immediately. What will you check?

Answer:

```
docker logs <container>
```

Entry point command

Application errors

23. Nginx page not accessible from browser. What will you troubleshoot?

Answer:

Container status (docker ps)

Port mapping

Firewall rules

Correct host IP

■ ALPINE & IMAGE OPTIMIZATION QUESTIONS

24. Why choose Alpine Linux?

Answer:

Small size

Faster image pull

Reduced vulnerabilities

25. What is the size difference between Alpine and full images?

Answer:

Alpine images are typically 5–10x smaller than full OS images.

■ NETWORKING QUESTIONS

26. What network does Docker use by default?

Answer:

Docker uses the bridge network by default.

27. How does Docker networking work internally?

Answer:

Docker creates a virtual bridge and assigns IPs to containers for internal communication.

■ SECURITY QUESTIONS

28. Is running containers as root safe?

Answer:

No. It is recommended to run containers as non-root users in production.

29. How do you secure Docker containers?

Answer:

Use minimal images

Avoid root user

Limit exposed ports

Apply resource limits

■ INTERVIEW TRICK QUESTIONS

30. Does docker run pull the image automatically?

Answer:

Yes, if the image is not present locally.

31. What happens if a container name already exists?

Answer:

Docker throws an error unless the container is removed or renamed.

32. Difference between EXPOSE and -p?

Answer:

EXPOSE documents the port

```
-p actually publishes the port
```


■ PRODUCTION-LEVEL / L2-L3 QUESTIONS

33. How would you make this container restart automatically?

```
docker run -d --restart unless-stopped nginx:alpine
```

34. How would you persist Nginx content?

Answer:

By mounting a volume:

-v /host/path:/usr/share/nginx/html

35. How would you deploy multiple environments?

Answer:

Using Docker Compose or Kubernetes.

■ ONE-LINE INTERVIEW ANSWERS (MEMORIZE)

Docker: Platform for containerizing applications

Image: Blueprint of a container

Container: Running instance of an image

Port mapping: Host-to-container traffic forwarding

Alpine: Lightweight Linux distribution

■ FINAL INTERVIEW SUMMARY (VERY POWERFUL)

"I deployed an Nginx web server using the lightweight nginx:alpine Docker image, exposed it via Docker port mapping by mapping host port 3001 to container port 80, verified service availability, and ensured the container remained in a running state following production best practices."