

Docker Networking and Port Access

In Docker, containers are isolated by default, meaning:

- Containers cannot access the host machine's ports directly.
- Containers cannot access the ports of other containers directly.
- Container ports are not accessible from outside the host machine unless configured.

To access a container's port from outside (e.g., from the host or another machine), use:

Port Mapping

```
docker run -p host_port:container_port imagename
```

Maps a container's port to a port on the host machine.

Host Network

```
docker run --network host imagename
```

Shares the host's network namespace with the container.

Accessing Container Ports from Another Container

To allow inter-container communication, create and use a custom Docker network.

Steps:

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1. Create a Docker Network

```
docker network create my_network
```

2. Run Containers in the Same Network

```
docker run --network my_network --name container1 imagename
```

```
docker run --network my_network --name container2 imagename
```

3. Access One Container from Another

Use the container name and port:

```
container1:port
```

Example Scenario

1. Create a Network

```
docker network create my_network
```

2. Run First Container

```
docker run --network my_network --name webserver -d nginx
```

3. Run Second Container

```
docker run --network my_network --name client -it alpine /bin/sh
```

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4. Access Web Server from Client

Inside the client container:

```
wget -qO- http://webserver
```

or

```
curl http://webserver
```

Important Notes

- Container-to-Container Access: Containers in the same custom network can communicate using their names as hostnames.
- Host Machine Access: Containers cannot directly access the host machine's ports.
- External Access: Use port mapping or host networking to access container ports from outside the host machine.

List Docker Networks:

```
docker network ls
```

Use this command to list all available Docker networks and verify the existence of custom networks.