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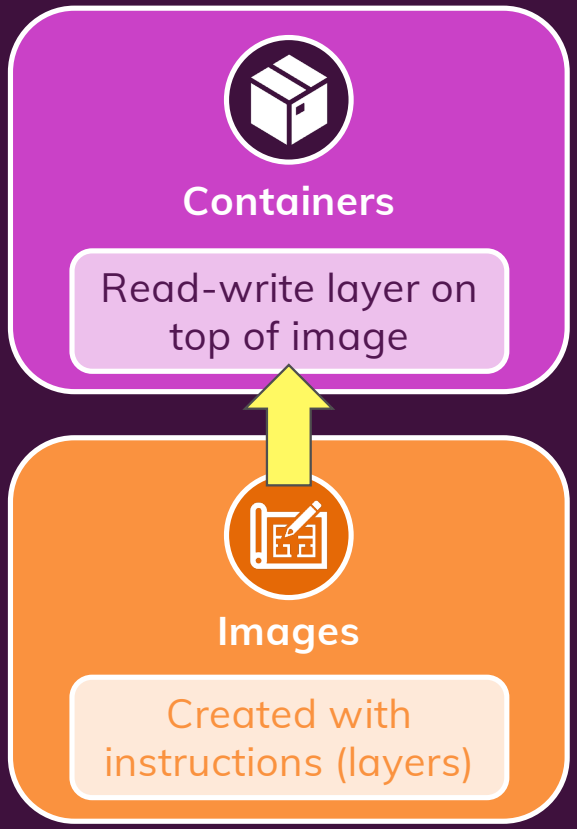
Docker Core Concepts



- Isolated
- Single-task-focused
- Shareable, reproducible
- Stateless (+ volumes)

- Blueprints for Containers
- Code + environment
- Read-only / does not run
- Can be built + shared

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Key Commands

Build an image based on a **Dockerfile**

```
docker build -t NAME:TAG .
```

- `-t NAME:TAG` — Name & versions of an image
- `.` — Build context

Run a container based on a **remote or local Image**

```
docker run --name NAME --rm -d IMAGE
```

- `--name NAME` — Container name
- `--rm` — Remove once stopped
- `-d` — Detached mode

Share (push) an Image to a **Registry** (default: **DockerHub**)

```
docker push REPOSITORY/NAME:TAG
```

Fetch (pull) an Image from a **Registry** (default: **DockerHub**)

```
docker pull REPOSITORY/NAME:TAG
```

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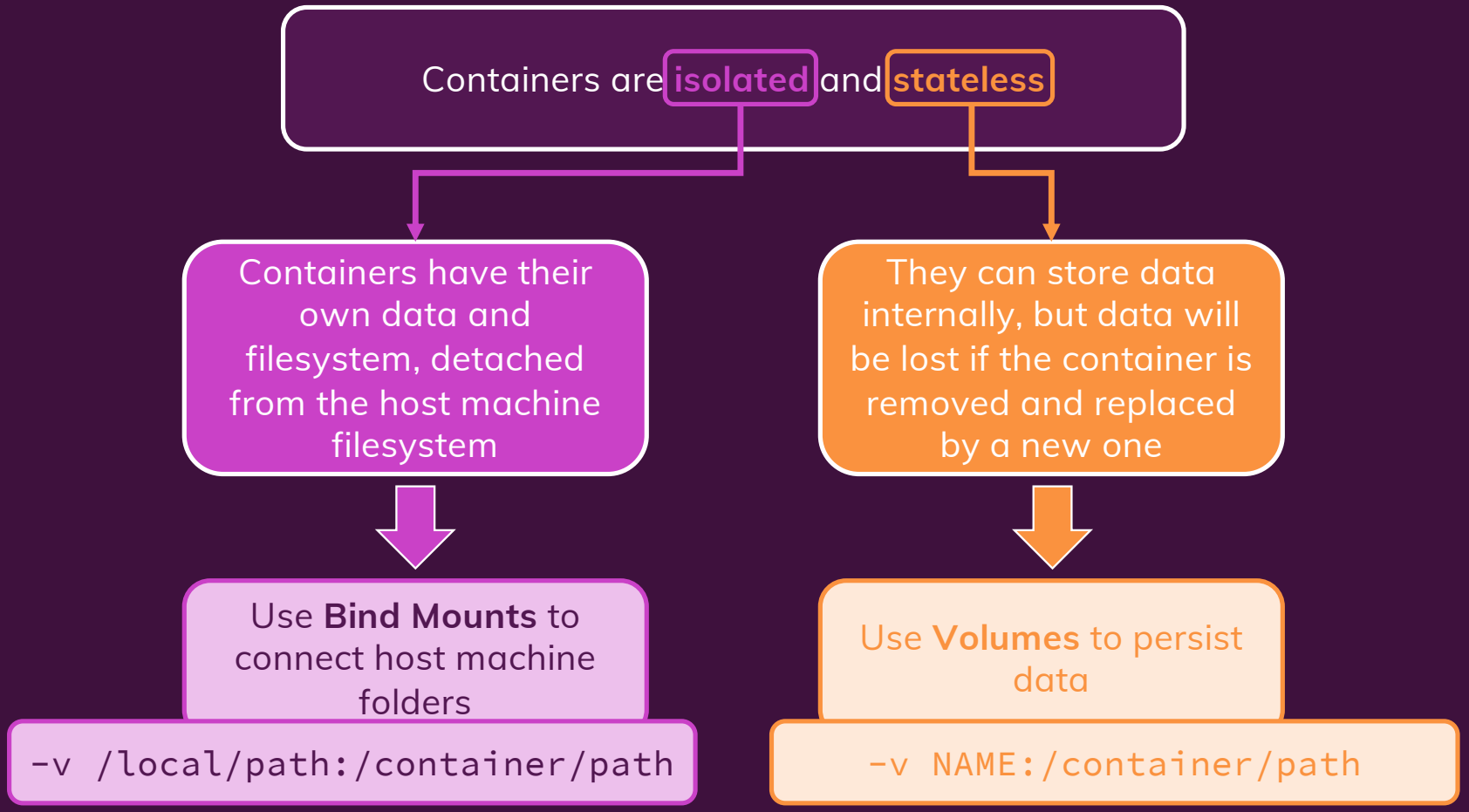
Docker Containers & Data



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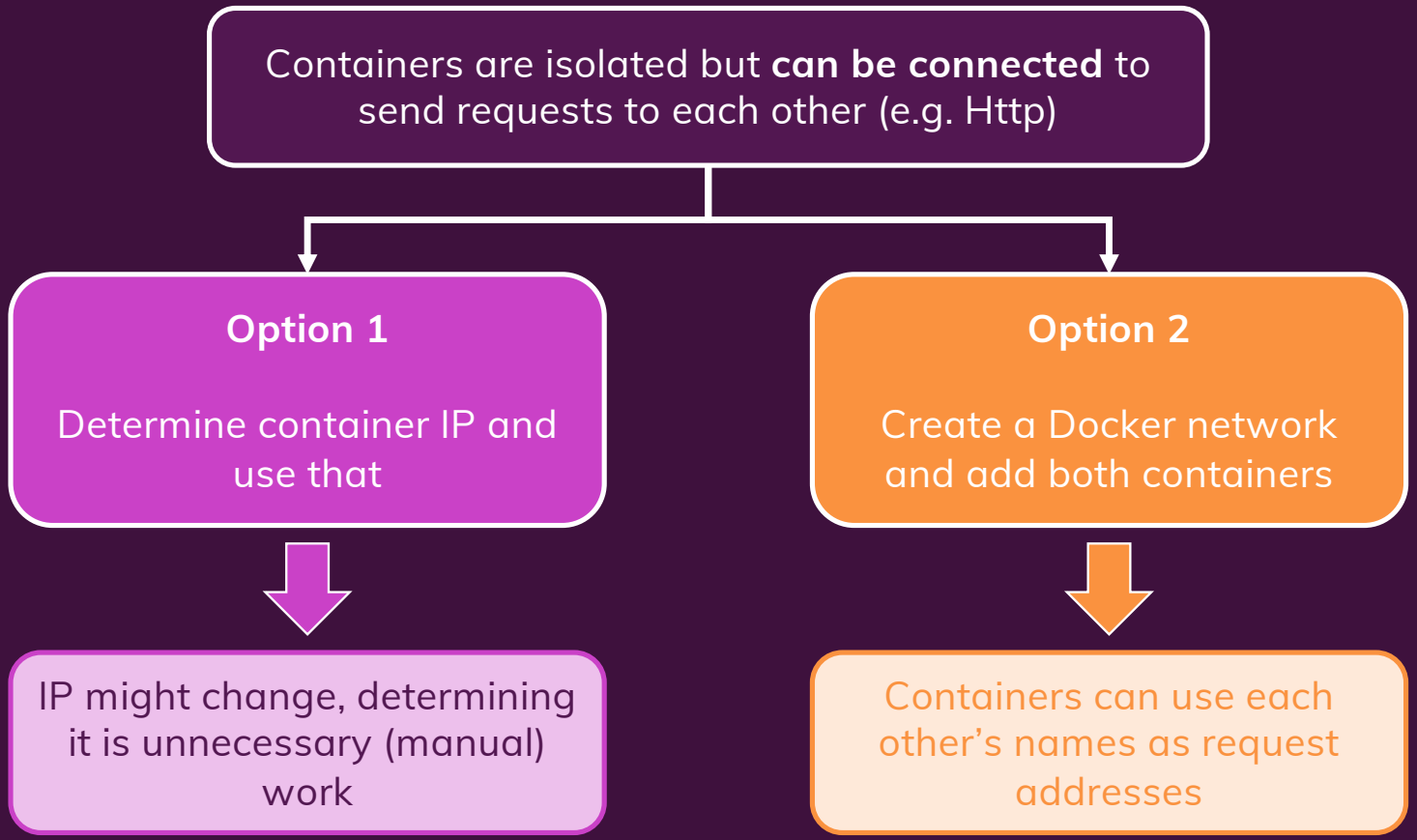
Docker Containers & Networks



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Docker vs Docker Compose

Repeating long **`docker build`** and **`docker run`** commands gets annoying – especially when working **with multiple containers**

Docker Compose allows you to pre-define build and run configuration in a .yaml file

`docker-compose up`

Build missing images and start all containers

`docker-compose down`

Stop all started containers

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Local Host (Development) vs Remote Host (Production)

Local Host / Development	Remote Host / Production
Isolated, encapsulated, reproducible development environments	Isolated, encapsulated, reproducible environments
No dependency or software clashes	Easy updates: Simply replace a running container with an updated one

Develop your application in the same environment you'll run it in after deployment

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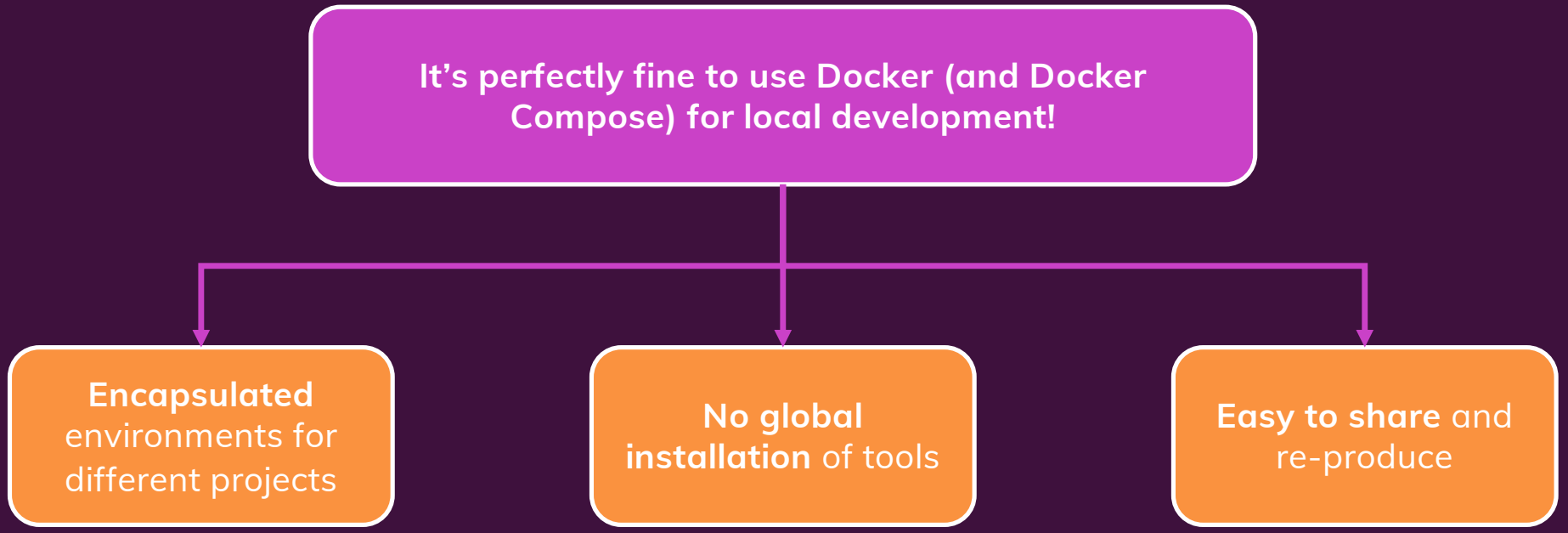
Deployment Is Optional!



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Deployment Considerations

Replace Bind Mounts with Volumes or COPY

Multiple containers might need multiple hosts

But they can also run on the same host (depends on application)

Multi-stage builds help with apps that need a build step

Control vs Ease-of-use

You can launch a remote server, install Docker and run your containers

Full control but you also need to manage everything

You can use a managed service instead

Less control and extra knowledge required but easier to use, less responsibility