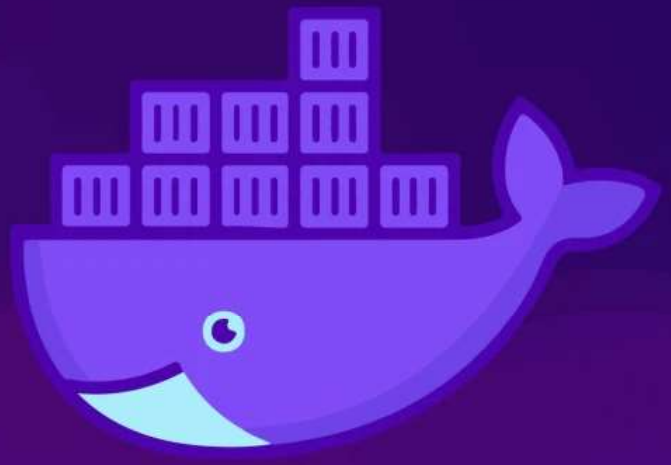
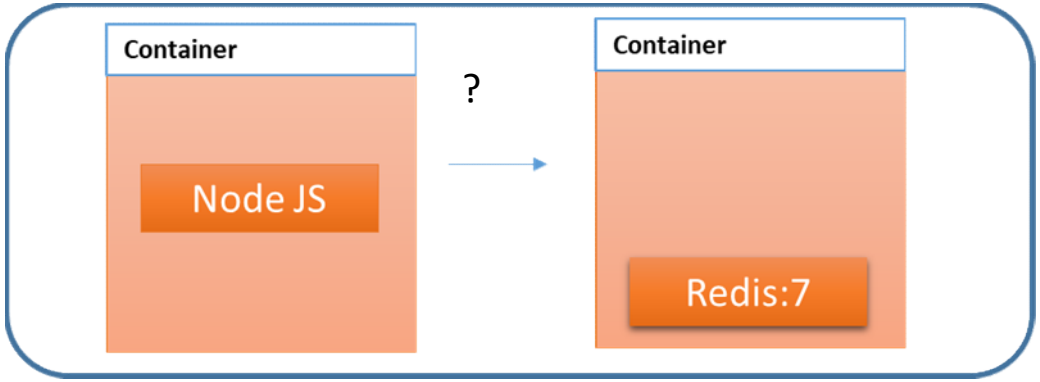


docker

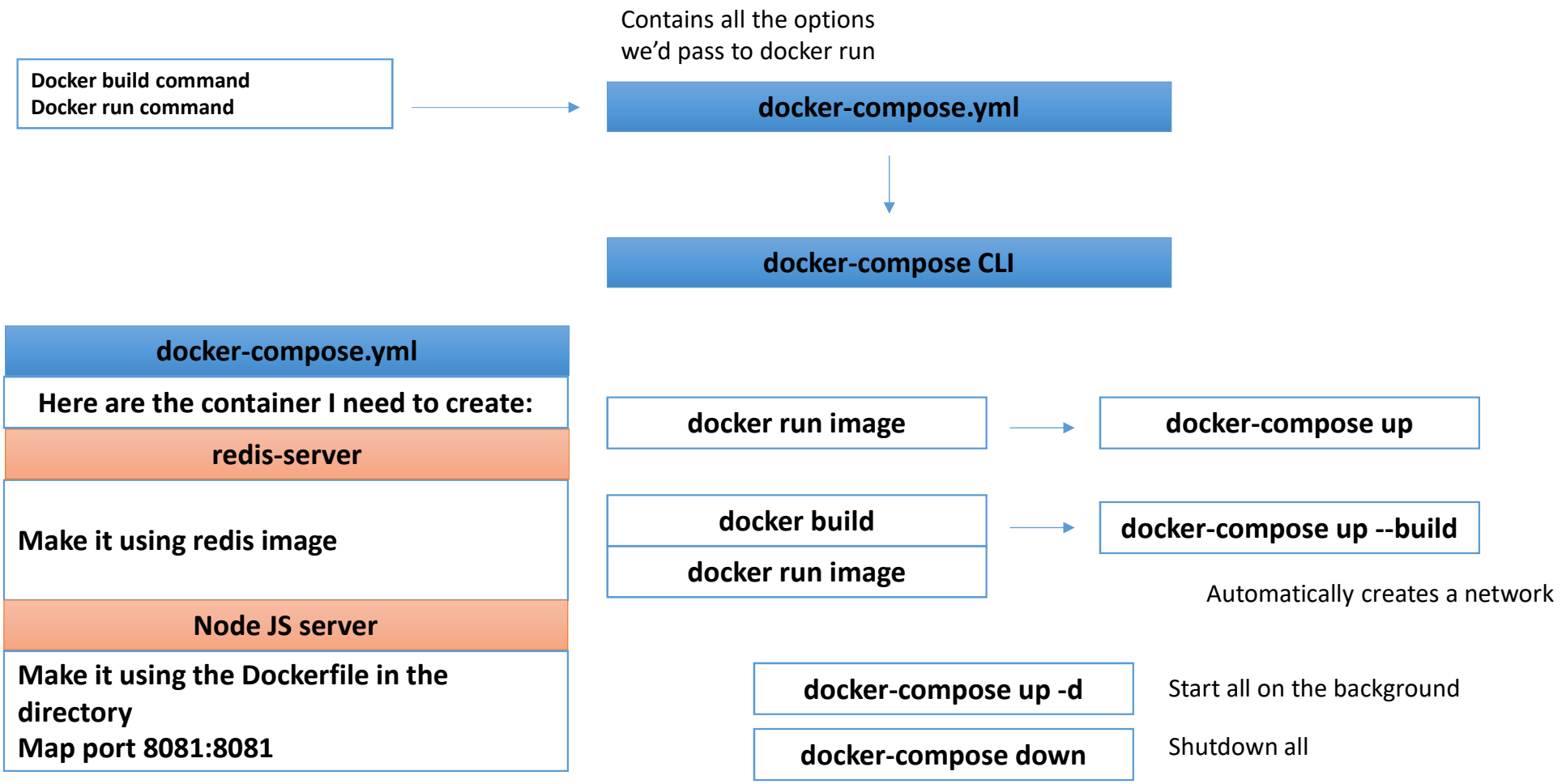
Day 3

Docker Compose

- There is not real connection between the containers in our project
- Two options:
  - Use Docker CLI (pain)
  - Use Docker Compose
- Docker Compose
  - Separate CLI installed
  - Used to start up multiple containers at the same time
  - Automates a long set of options that go into docker run command



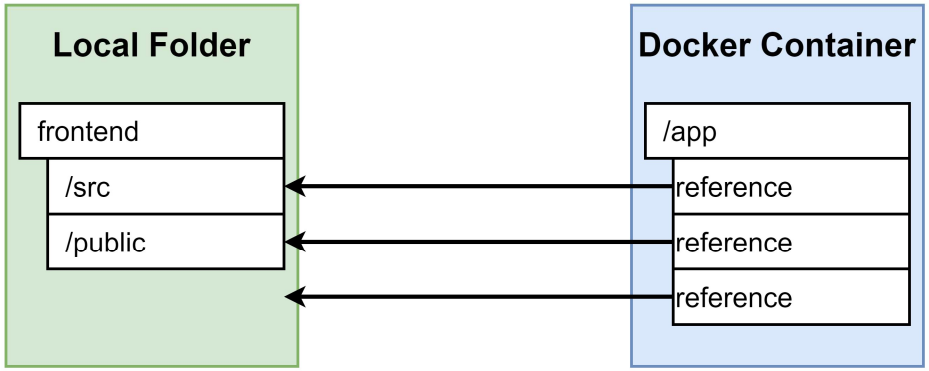
Docker Compose

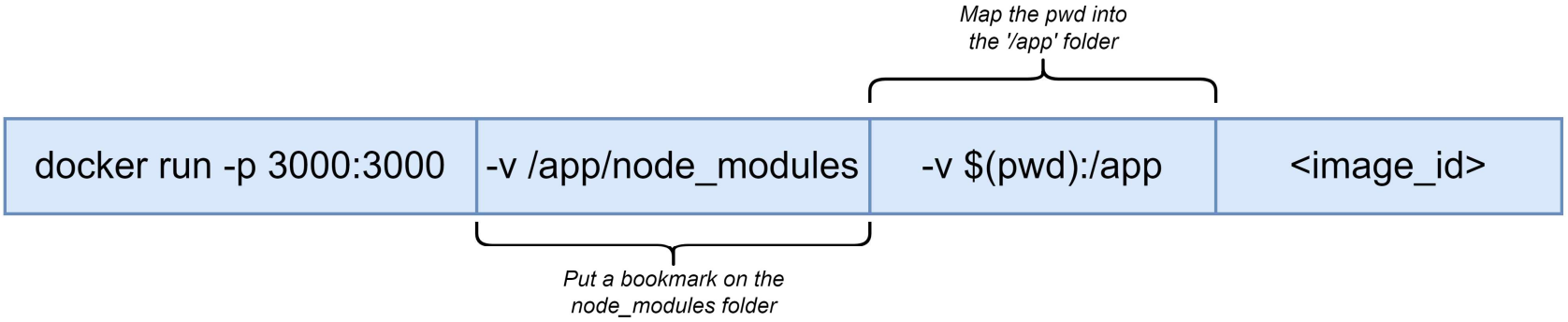


Docker Volumes

- Volumes are the preferred mechanism for persisting data generated by and used by Docker containers.

Docker Volumes





Docker Networking

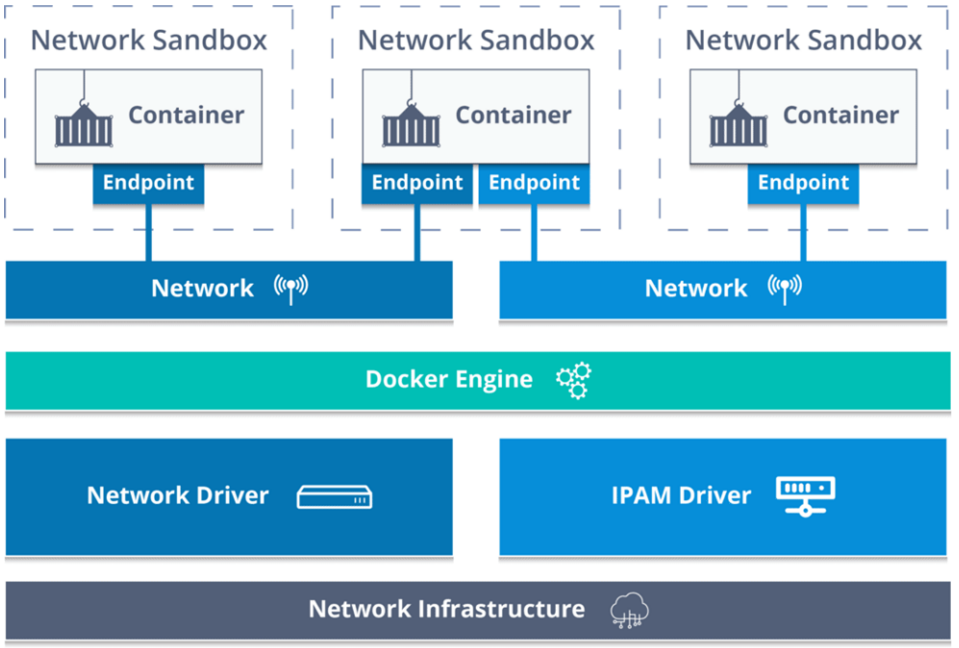
- How do containers talk to each other?
- Two ways:
  - Sharing files
  - Communicate through networking
- Containers are ideal for applications or processes which expose some sort of network service. The most well-known examples of these kinds of applications are:
    - Web servers - e.g. Nginx, Apache
    - Backend applications and APIs - e.g. Node, Python, JBoss, Wildfly, Spring Boot
    - Databases and data stores - e.g. MongoDB, PostgreSQL

Docker Networking

- 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. In a network, a container has an IP address, and optionally a hostname.
- Fundamental networks in docker:
  - Bridge network
  - User defined network

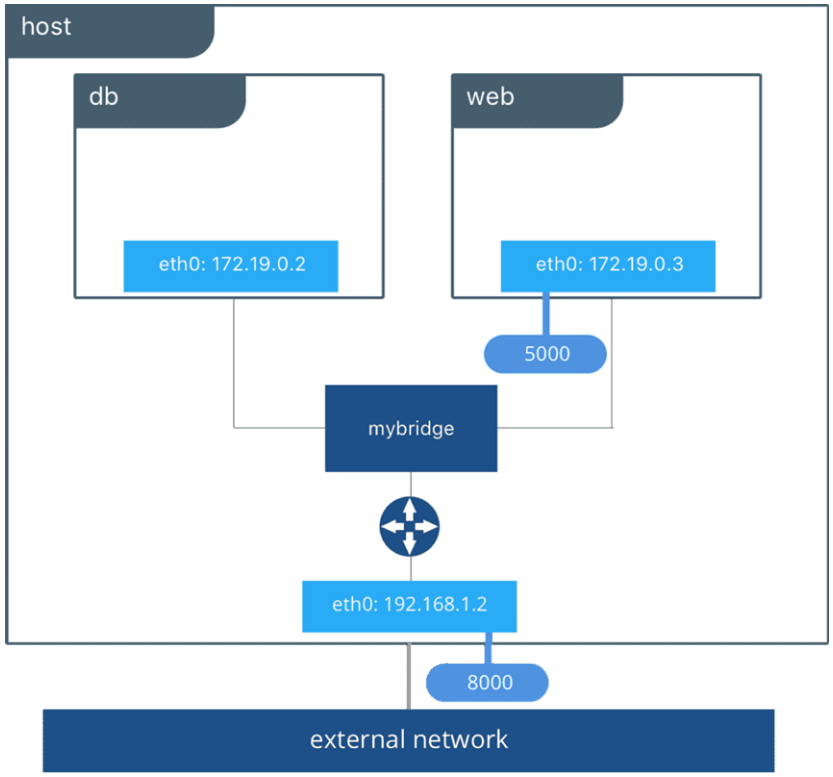
Docker Networking

- Docker uses CNM (Container Network Model) for networking. This model standardizes the steps required to provide networking for containers using multiple network drivers.



Bridge Network

- A bridge network gives you simple communication between containers on the same host.
- When Docker starts up, it will create a default network called bridge. It should start automatically, without any configuration required by you.
- In a bridge network, each container is assigned its own IP address. So containers can communicate with each other by IP.

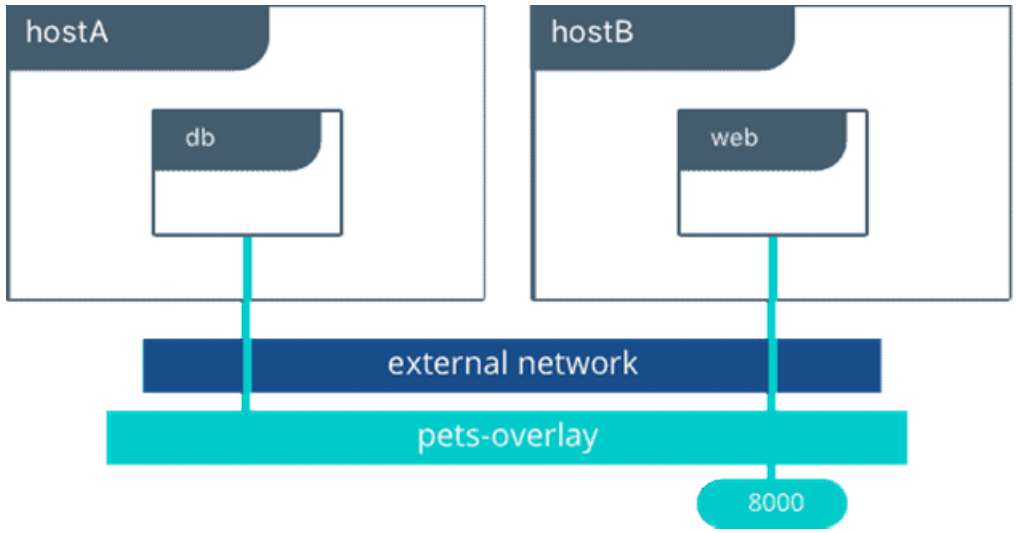


User Defined Network

- If you only use the default bridge network, then all your containers can see and access other containers' ports.
- When the containers are joined to the user-defined bridge network, they can address each other by this name. You do not need IP addresses.

Overlay Networking

- Overlay networking is used if container on node A wants to talk to node B then to make communication between them we use Overlay networking.
- Overlay networking uses VXLAN to create an Overlay network.
- This has the advantage of providing maximum portability across various cloud and on-premises networks.
- By default, the Overlay network is encrypted with the AES algorithm.



Macvlan

- Macvlan network is used to connect applications directly to the physical network.
- By using the macvlan network driver to assign a MAC address to each container, also allow having full TCP/Ip stack. Then, the Docker daemon routes traffic to containers by their MAC addresses.
- You can isolate your macvlan networks using different physical network interfaces. This is used in legacy applications which require MAC address.