

DYALOG

Belfast 2018

Workshop TP2
Docker-Compose
Kubernetes

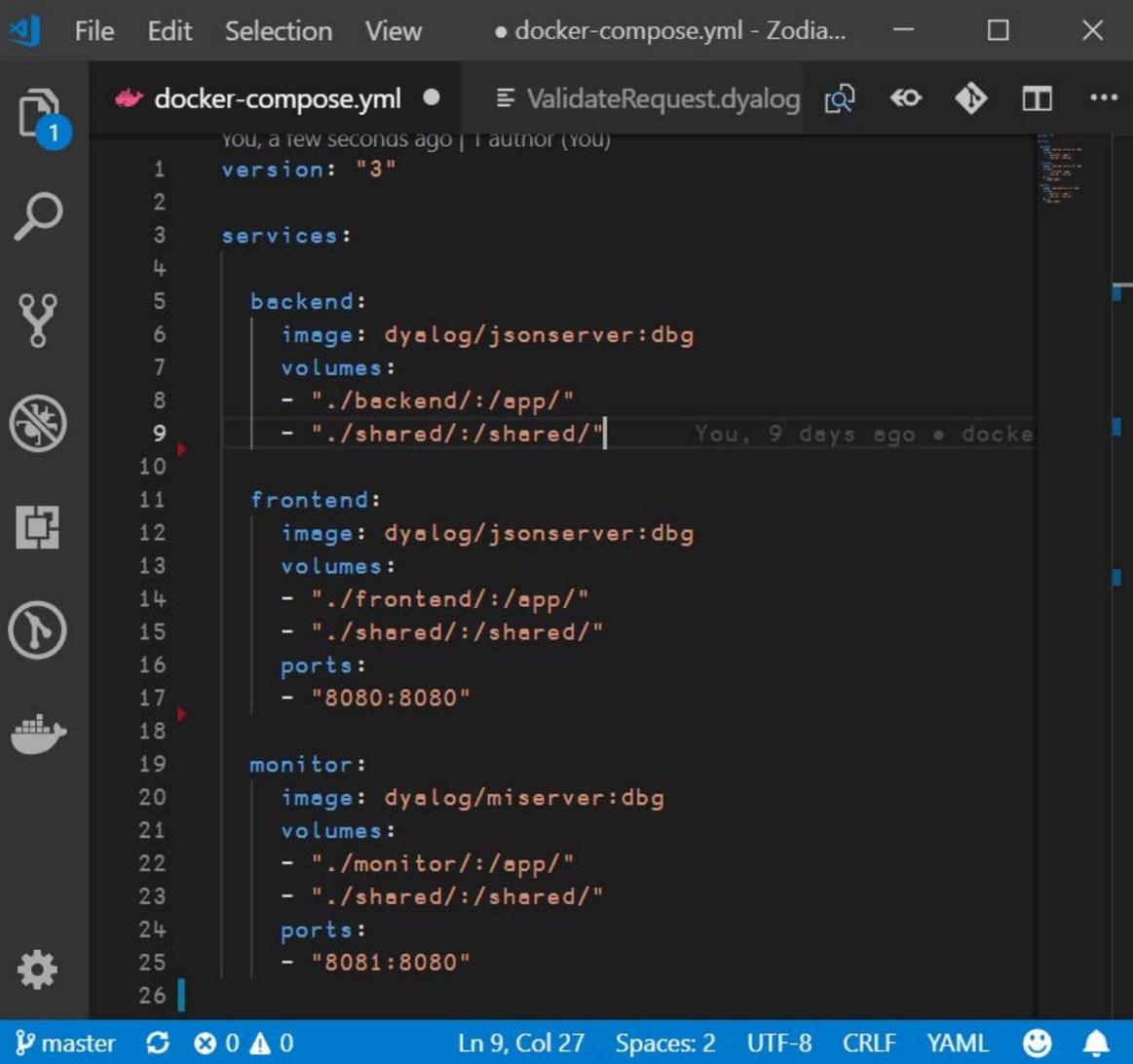
Morten Kromberg, CXO, Dyalog

Docker-Compose

- A docker-compose.yml file allows you to define a group of services that work together
- docker-compose will run the containers within a "virtual network"
- Local DNS allows each service to refer to the others by name



docker-compose



```
docker-compose.yml
ValidateRequest.dyalog

you, a few seconds ago | author (you)
1  version: "3"
2
3  services:
4
5     backend:
6       image: dyalog/jsonserver:dbg
7       volumes:
8         - "./backend:/app/"
9         - "./shared:/shared/"
10
11    frontend:
12      image: dyalog/jsonserver:dbg
13      volumes:
14        - "./frontend:/app/"
15        - "./shared:/shared/"
16      ports:
17        - "8080:8080"
18
19    monitor:
20      image: dyalog/miserver:dbg
21      volumes:
22        - "./monitor:/app/"
23        - "./shared:/shared/"
24      ports:
25        - "8081:8080"
26
```

docker-compose

Image

```
docker-compose.yml • ValidateRequest.dyalog 🔍 ↶ ⚙️ 📄 ...
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File Edit Selection View • docker-compose.yml - Zodia...
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Image

-v (volume mount)

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docker-compose

Image

-v (volume mount)

-p (port maps)

docker-compose

- Docker-compose provides simple replication features
- Each replica thinks it is the only listener on port 8080
- Load balancers using virtual networking to switch between
- A selection of load balancers is available, the default is "round robin".

```
File Edit Selection View docker-compose-swarm
! docker-compose-swarm.yml x ValidateR
You, 7 days ago | 1 author (You)
1 version: "3.3" You, 7 days ago
2
3 services:
4
5   backend:
6     image: dyalog/jsonserver:dbg
7     volumes:
8       - "./backend:/app/"
9       - "./shared:/shared/"
10    ports:
11      - "4503:4502"
12
13   frontend:
14     image: dyalog/jsonserver:dbg
15     volumes:
16       - "./frontend:/app/"
17       - "./shared:/shared/"
18    ports:
19      - "8080:8080"
20      # - "4502:4502" RIDE not possi
21    deploy:
22      mode: replicated
23      replicas: 2
24      endpoint_mode: vip
25
# master 0 0 Ln 1, Col 1 Spaces: 2
```

Docker Swarm

docker-compose services can be deployed under "Docker Swarm" for additional scaling support:

```
docker swarm init
docker node ls
docker stack deploy --compose-file docker-compose-swarm.yml zodiacservice
docker stack rm zodiacservice
docker service scale zodiacservice_frontend=3
docker swarm leave --force
```

Docker-compose, Swarm and Kubernetes are evolving very rapidly and I ran out of time researching them.



Exercise

- Experiment with docker-compose and docker swarm.
- Run 4 copies of the frontend
- Verify using the monitor



Exercise / Project

- Complete the ZodiacService application to
 - record calls in a shared component file
 - enhance the monitor to report usage of each frontend instance in a replicated deployment



Marko's "Serverless Laboratory"

Minikube VM



Docker daemon



Private
Docker
Registry

Kubernetes cluster



Linux Node

Kubeless
Service



Kubeless Replica Set



Kubeless
Pod



Kubeless
Pod



Marko's "Serverless Laboratory"

Minikube VM



Docker daemon



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Kubeless
Pod



Kubernetes

- The equivalent of a docker-compose file is called a "Pod"
- Kubernetes manages a number of nodes (1 master + 0 or more)
- Services can be replicated within a Pod, and Pods can be replicated across the network of nodes.
- This turned out to be too difficult to set up for/in a 3 hour workshop 😊

