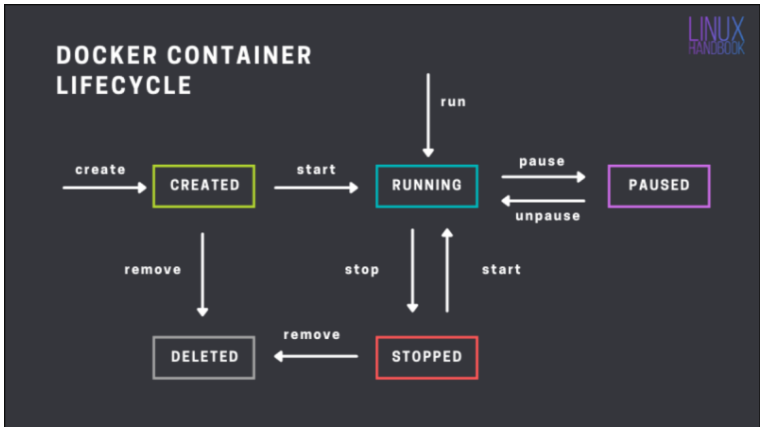
MENU ☰

APRIL 9, 2023

DevOps Classroomnotes 09/Apr/2023

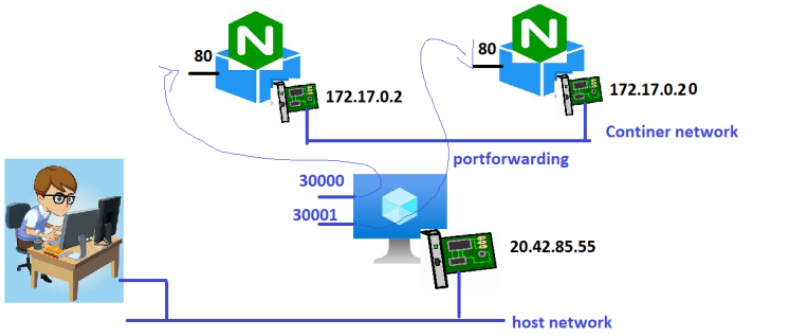
Docker container lifecycle

- Docker lifecycle states
  - Created
  - Running
  - Paused
  - Stopped
  - Deleted

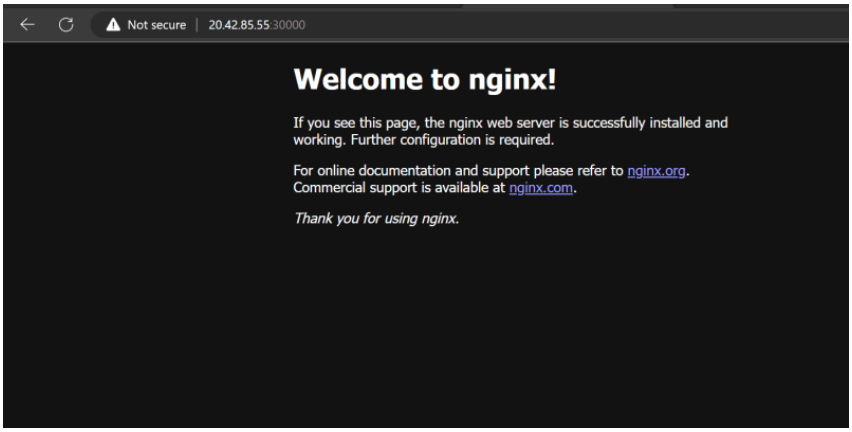


Accessing the applications inside docker containers

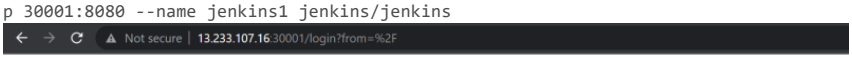
- From now the machine where we have installed docker will referred as host and the docker container will be referred as container
- We have access to host network & as of now containers are created in private container network, so to access applications inside containers we use port-forwording



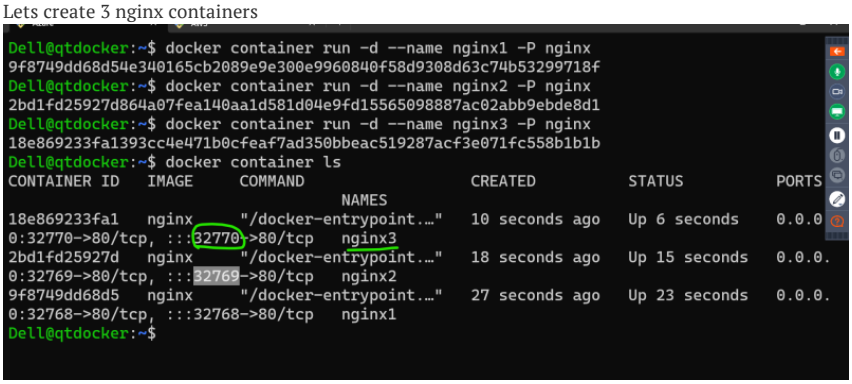
- command: `docker container run -d -p <host-port>:<container-port> <image>`
- Create a nginx container and expose on port 30000 `docker container run -d -p 30000:80 --name nginx1 nginx`

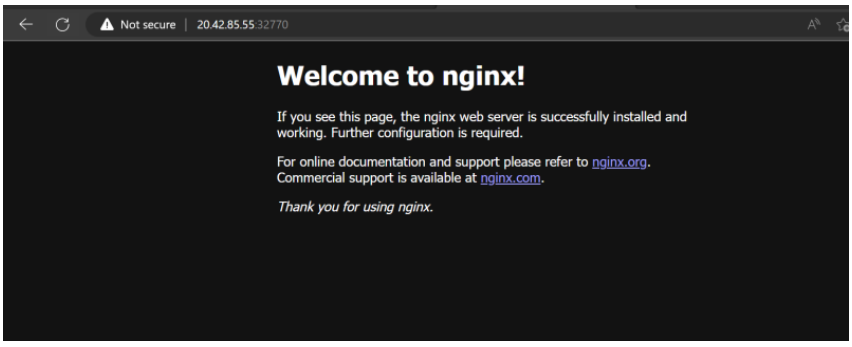


- Create a jenkins container & expose 8080 port on 30001 port of host `docker container run -d -p 30001:8080 --name jenkins1 jenkins/jenkins`



- To assing any random free port on host to container port `docker container run -d -P image`
- Lets create 3 nginx containers





Exercise

1. Install docker on a linux vm
2. Run 1 httpd containers (apache container) which runs on 80 port
3. try accessing any application
4. stop the containers
5. try accessing
6. start the continers and access this should work
7. pause the containers, access the application
8. unpause the containers, access the application
9. delete the container

Containerizing spring petclinic

- I have spring petclinic version 2.4.2 which requires java 11 and runs on port 8080
- to start application `java -jar spring-petclinic-2.4.2.jar`
- What is required:
    - jdk 11
    - jar file

- How to access application

    - http over port 8080

- Lets start the amazoncorretoo based container with port 8080 exposed Refer Here

```
docker container run -it -p 30000:8080 amazoncorretto:11 /bin/bash
```

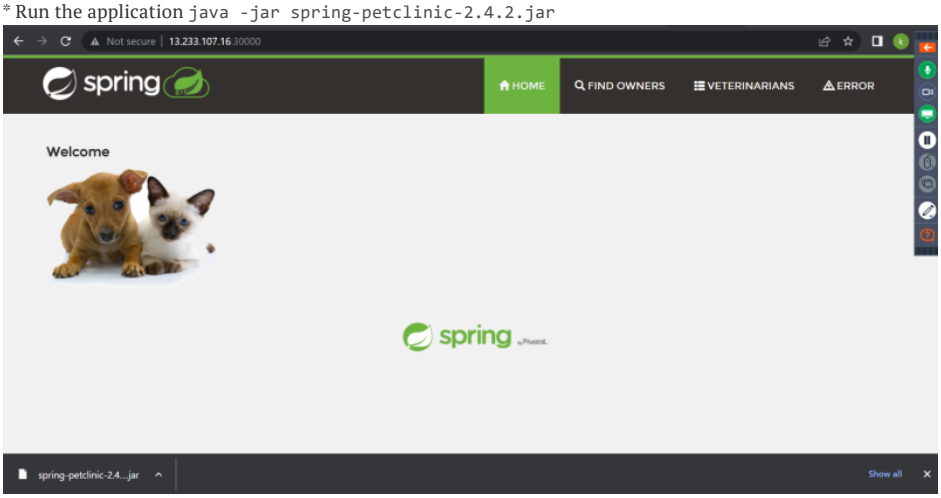
```
ubuntu@ip-172-31-35-3:~$ docker container run -it -p 30000:8080 amazoncorretto:11 /bi
n/bash
bash-4.2# java -version
openjdk version "11.0.18" 2023-01-17 LTS
OpenJDK Runtime Environment Corretto-11.0.18.10.1 (build 11.0.18+10-LTS)
OpenJDK 64-Bit Server VM Corretto-11.0.18.10.1 (build 11.0.18+10-LTS, mixed mode)
bash-4.2#
```

* now lets download the spring petclinic Refer Here

```
curl https://referenceapplicationskhaja.s3.us-west-2.amazonaws.com/spring-petclinic-2.4.2
ls
```

```
bash-4.2# curl https://referenceapplicationskhaja.s3.us-west-2.amazonaws.com/spring-p
etclinic-2.4.2.jar -o spring-petclinic-2.4.2.jar
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 47.4M  100 47.4M    0     0  3384k      0  0:00:14  0:00:14 --:--:-- 4006k
bash-4.2# ls
bin   dev  home  lib64  media  opt   root  sbin                        srv  tmp  var
boot  etc  lib   local  mnt    proc  run   spring-petclinic-2.4.2.jar  sys  usr
bash-4.2#
```

* Run the application `java -jar spring-petclinic-2.4.2.jar`



* Now to create a image from a running container, lets login into linux vm, so lets use `docker container commit`

```
ubuntu@ip-172-31-35-3:~$ docker container commit crazy_gagarin myspc:latest
sha256:5d93a130447d6c1b88497b036240b10afe89b15db844ab072d0a30816e3b56f4
ubuntu@ip-172-31-35-3:~$ docker image ls
REPOSITORY          TAG       IMAGE ID       CREATED          SIZE
myspc               latest    5d93a130447d   6 seconds ago    499MB
httpd               latest    dc1a95e13784   2 days ago       145MB
jenkins/jenkins     latest    e701a1b6fb83   4 days ago       471MB
amazoncorretto      11        ebc51ffa390b   11 days ago      449MB
ubuntu@ip-172-31-35-3:~$
```

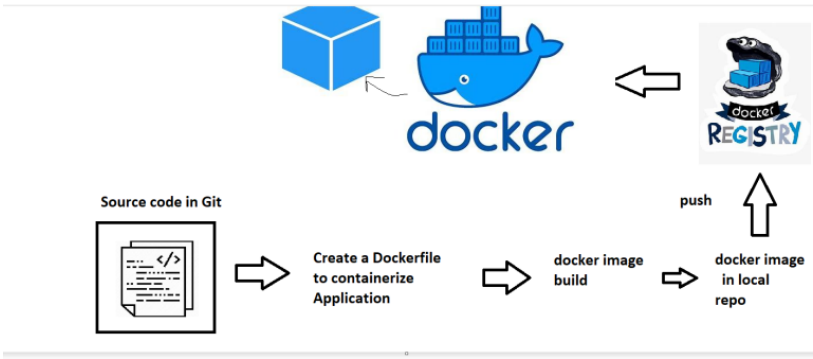
* remove all the containers and run the myspc image based container

```
docker container run -d -p 30001:8080 --name spc1 myspc:latest java -jar spring-petclinic
```

- This is not a useful approach as we are creating images manually
- DOcker has a better way i.e. `Dockerfile`

Dockerfile based Image building

- Workflow



- Dockerfile is a text file with instructions Refer Here
- The basic syntax `INSTRUCTION arguments`
- In Docker we have concept of base image i.e. to run your application using some existing image
- We can use a base image called as scratch which has nothing in it
- In majority of the cases we take what is required to run our application as base image.

Basic Instructions

- FROM: Refer Here for official docs. use tag all the time (donot use latest)
- RUN: The commands to be executed while building the image to install/configure your appliation Refer Here
- CMD: This command will be executed while starting the container. Refer Here for official docs
- EXPOSE: This adds ports to be exposed while starting the container Refer Here for official docs

Springpetclinic Dockerfile

- Lets do two ways
  - use any image with java11 already as base image `amazoncorretto:11`
  - use any image with slim os as base image `alpine:3`

- Dockerfile- based on amazoncorreto:11

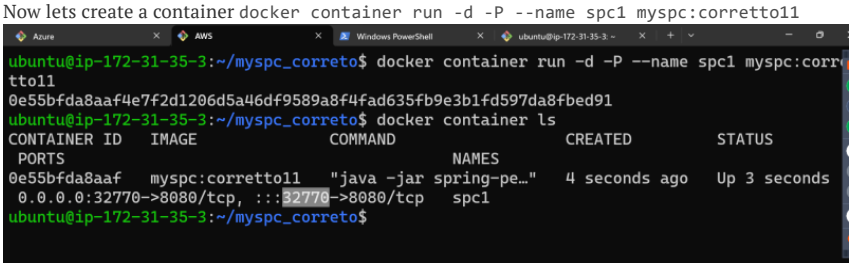
```
FROM amazoncorretto:11
RUN curl https://referenceapplicationskhaja.s3.us-west-2.amazonaws.com/spring-petclinic-2
EXPOSE 8080
CMD ["java", "-jar", "spring-petclinic-2.4.2.jar"]
```

- Lets build the image based on amazoncorreto

```
ubuntu@ip-172-31-35-3:~$ mkdir myspc_correto
ubuntu@ip-172-31-35-3:~$ cd myspc_correto/
ubuntu@ip-172-31-35-3:~/myspc_correto$ nano Dockerfile
ubuntu@ip-172-31-35-3:~/myspc_correto$ ls
Dockerfile
ubuntu@ip-172-31-35-3:~/myspc_correto$ docker image build -t myspc:corretto11 .
[+] Building 4.5s (4/5)
 => [internal] load build definition from Dockerfile                          0.1s
 => => transferring dockerfile: 253B                                          0.0s
 => [internal] load .dockerignore                                             0.1s
 => => transferring context: 2B                                               0.0s
 => [internal] load metadata for docker.io/library/amazoncorretto:11          0.0s
 => [1/2] FROM docker.io/library/amazoncorretto:11                            0.0s
 => [2/2] RUN curl https://referenceapplicationskhaja.s3.us-west-2.amazonaws.c  4.4s
 => => #   0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
 => => #   0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
 => => #   0 47.4M    0  134k    0     0  83299      0  0:09:57  0:00:01  0:09:56 83
 => => #   7 47.4M    7 3830k    0     0  1400k      0  0:00:34  0:00:02  0:00:32 14
 => => #  13 47.4M   13 6598k    0     0  1803k      0  0:00:26  0:00:03  0:00:23 18
 => => # 02k
```

```
ubuntu@ip-172-31-35-3:~/myspc_correto$ docker image ls
REPOSITORY       TAG          IMAGE ID       CREATED             SIZE
myspc            corretto11   5eb3d9bb3de7   About a minute ago   499MB
amazoncorretto   11           ebc51ffa390b   11 days ago          449MB
ubuntu@ip-172-31-35-3:~/myspc_correto$ docker image tag myspc:corretto11 myspc:latest
ubuntu@ip-172-31-35-3:~/myspc_correto$ docker image ls
REPOSITORY       TAG          IMAGE ID       CREATED         SIZE
myspc            corretto11   5eb3d9bb3de7   2 minutes ago   499MB
myspc            latest       5eb3d9bb3de7   2 minutes ago   499MB
amazoncorretto   11           ebc51ffa390b   11 days ago     449MB
ubuntu@ip-172-31-35-3:~/myspc_correto$
```

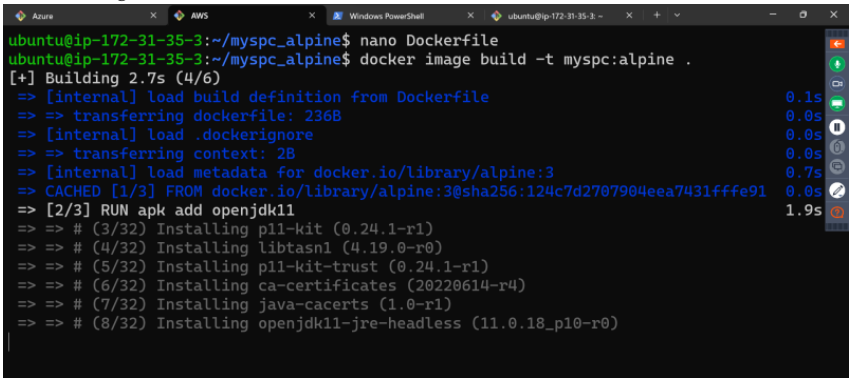
- Now lets create a container `docker container run -d -P --name spc1 myspc:corretto11`

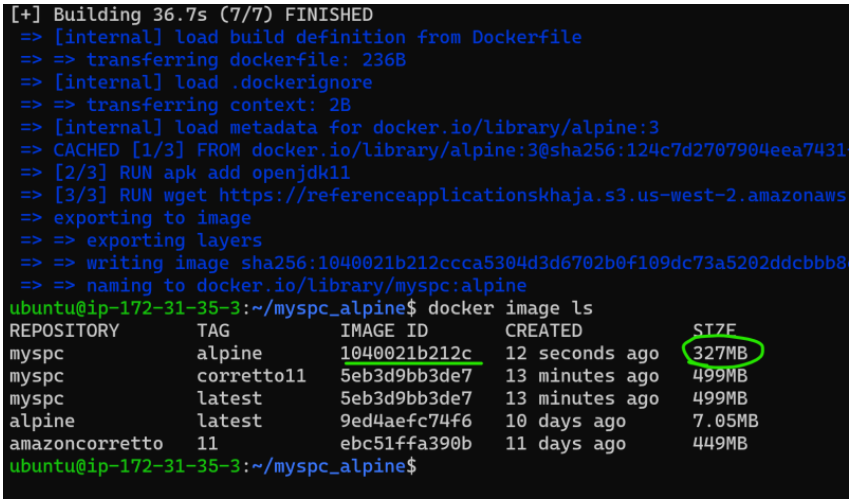


- Approach 2: Start from some os

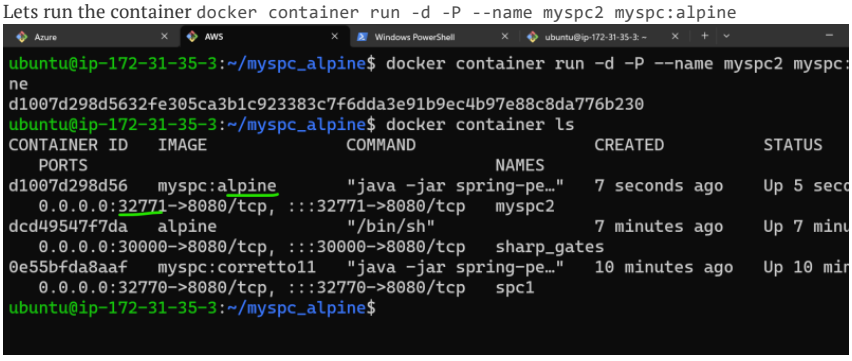
```
FROM alpine:3
RUN apk add openjdk11
RUN wget https://referenceapplicationskhaja.s3.us-west-2.amazonaws.com/spring-petclinic-2
EXPOSE 8080
CMD ["java", "-jar", "spring-petclinic-2.4.2.jar"]
```

- Build the image





- Lets run the container `docker container run -d -P --name myspc2 myspc:alpine`



Immutable Infrastructure

- Any infra changes will not be done on infra directly rather we create some infra as code option and change the configuration.

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