

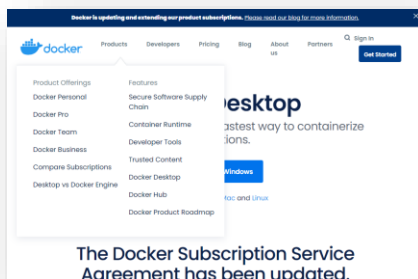
Docker é um conjunto de produtos de plataforma como serviço que usam virtualização de nível de sistema operacional para entregar software em pacotes chamados contêineres. Os contêineres são isolados uns dos outros e agrupam seus próprios softwares, bibliotecas e arquivos de configuração.

A necessidade de transferir aplicações de um ambiente computacional para outro com segurança e rapidez tornou-se crítica para os negócios e times de desenvolvimento e operações. E foi materializada pelo conceito de contêiner, que tira mais esse problema da frente, encapsulando as aplicações em uma estrutura isolada e portátil.

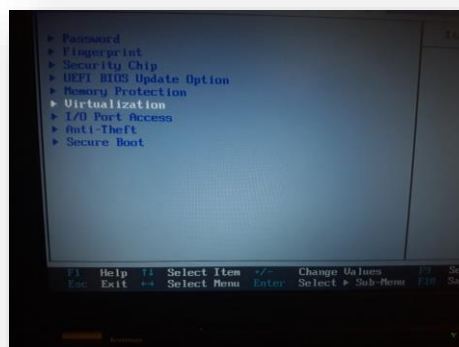
Embora seja uma das ferramentas de containerização mais usadas e conhecidas, o Docker não está sozinho. Há outros fornecedores no ecossistema: ContainerD, CoreOS, Canonical, LXC Linux Containers, CRI-O e Mesos Containerizer.

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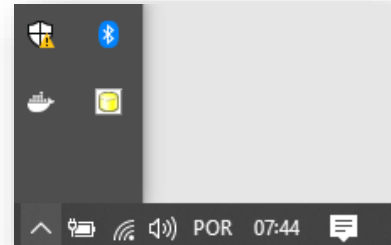
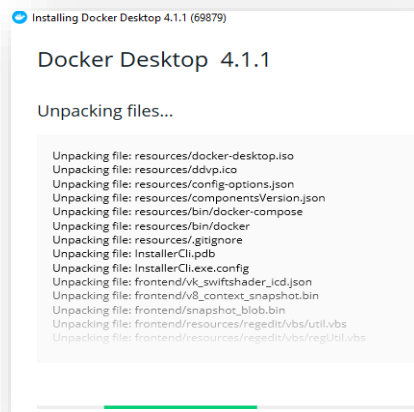
O primeiro passo e descarregar Docker para Windows ele foi desenhado inicialmente para ambiente Linux mas com o tempo saíram versões para mac e Windows 10(se não for 10 não vai funcionar



Acessando na bios ao iniciar o sistema e apertando f4 ativamos a virtualização(o q e) necessária para poder trabalhar com Docker.



O instalador para Windows faz toda a configuração previa



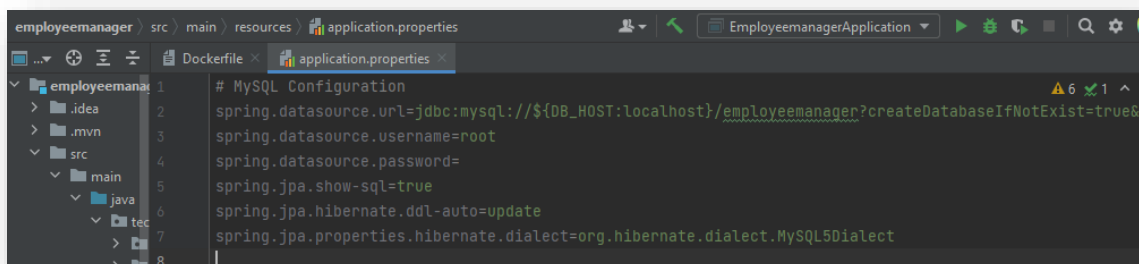
Para este exemplo e importante ter configurado as variáveis de ambientes do Maven já que precisa compilar a API

Acedemos na pasta do arquivo

```
04/11/2021 14:35 <DIR> .
04/11/2021 14:35 <DIR> ..
04/11/2021 13:50 <DIR> .idea
18/08/2020 23:55 <DIR> .mvn
04/11/2021 14:34 0 Dockerfile
18/08/2020 23:55 1.204 HELP.md
18/08/2020 23:55 10.070 mvnw
18/08/2020 23:55 6.608 mvnw.cmd
18/08/2020 23:55 1.682 pom.xml
18/08/2020 23:55 42 README.md
18/08/2020 23:55 <DIR> src
04/11/2021 13:50 <DIR> target
6 arquivo(s) 19.606 bytes
6 pasta(s) 113.720.016.896 bytes disponíveis

C:\Users\USER\Desktop\Nova pasta\employeemanager>
```

E no arquivo application.properties dentro do Spring configuramos a base de dados com uma variável para que possa ser interpretado pelo Docker



Compilamos o arquivo posteriormente ter feito a configuração

```
C:\Users\USER\Desktop\Nova pasta\employeemanager>mvnw clean package
[INFO] Scanning for projects...
[INFO]
[INFO] -----< tech.getarrays:employeemanager >-----
[INFO] Building employeemanager 0.0.1-SNAPSHOT
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- maven-clean-plugin:3.1.0:clean (default-clean) @ employeemanager ---
[INFO] Deleting C:\Users\USER\Desktop\Nova pasta\employeemanager\target
[INFO]
[INFO] --- maven-resources-plugin:3.1.0:resources (default-resources) @ employeemanager ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 1 resource
[INFO] Copying 0 resource
[INFO]
[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ employeemanager ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 6 source files to C:\Users\USER\Desktop\Nova pasta\employeemanager\target\classes
[INFO]
[INFO] --- maven-resources-plugin:3.1.0:testResources (default-testResources) @ employeemanager ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory C:\Users\USER\Desktop\Nova pasta\employeemanager\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ employeemanager ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to C:\Users\USER\Desktop\Nova pasta\employeemanager\target\test-classes
[INFO]
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/httpcomponents/httpclient/4.5.12/httpclient-4.5.12.jar (778 kB at 275 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/com/google/guava/guava/16.0.1/guava-16.0.1.jar (2.1 MB at 1.8 MB/s)
[INFO] Replacing main artifact with repackaged archive
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 43.064 s
[INFO] Finished at: 2021-11-04T14:41:08-03:00
[INFO]
C:\Users\USER\Desktop\Nova pasta\employeemanager>
```

O arquivo compilado se encontra na pasta target <nome_do_arquivo>.jar

E geramos um arquivo dentro da API Spring com o nome Dockerfile que contém as instruções para o Docker

FROM: o arquivo necessário a descarregar de dockerhub

WORKDIR: o nome da pasta do arquivo compilado no Docker

COPY: faz uma cópia do arquivo compilado original (indicado pelo * para ler qualquer nome)na pasta target feito previamente, na pasta app criada com o nome api.jar

EXPOSE: indica o porto que vai utilizar no Docker

CMD: mediante um array indica o nome para executar a cópia compilada pelo Docker no caso api.jar

```
Dockerfile x
Plugins supporting Dockerfile files found.
1 FROM openjdk:11-jre-slim
2
3 WORKDIR /app
4
5 COPY target/*.jar /app/api.jar
6
7 EXPOSE 8080
8
9 CMD ["java", "-jar", "api.jar"]
```

No cmd criamos a imagem da API Spring

```
C:\Users\USER\Desktop\Nova pasta\employeemanager>docker image build -t employee .
[+] Building 23.2s (9/9) FINISHED
=> [internal] load build definition from Dockerfile                                0.0s
=> => transferring dockerfile: 161B                                              0.0s
=> [internal] load .dockerignore                                                 0.0s
=> => transferring context: 28                                                  0.0s
=> [internal] load metadata for docker.io/library/openjdk:11-jre-slim          3.0s
=> [auth] library/openjdk:pull token for registry-1.docker.io                 0.0s
=> [internal] load build context                                                3.8s
=> => transferring context: 37.94MB                                             3.6s
=> [1/3] FROM docker.io/library/openjdk:11-jre-slim@sha256:9223f8e5033f47c86323d31aa98a3779c4edd89d92194287f04e2f5391 17.0s
=> => resolve docker.io/library/openjdk:11-jre-slim@sha256:9223f8e5033f47c86323d31aa98a3779c4edd89d92194287f04e2f5391 0.0s
=> => sha256:9223f8e5033f47c86323d31aa98a3779c4edd89d92194287f04e2f5391fd9ac1 549B / 549B 0.0s
=> => sha256:5352ab58af2d68ab429b2deb82b3a5ba52b0785acff983f8f847798463871ab 1.16kB / 1.16kB 0.0s
=> => sha256:8f09b7480f2278210b2d6c472da4dccc192ee7dd80dc2c66576f465f7070612 7.56kB / 7.56kB 0.0s
=> => sha256:7d63c13d9b9b6ec5f05a2b07daadacaa9c610d01102a662ae9b1d082105f1ffa 31.36MB / 31.36MB 0.5s
=> => sha256:225be9814eda07dabebf0e4deb415366f34b2cfe12ef1ad167ba1104423f42d7 1.58MB / 1.58MB 1.5s
=> => sha256:c78f8a9ed8840e88c8c3b0627b42a9405d360a5e44b32f2d7fe9a40e02329726 211B / 211B 0.8s
=> => sha256:1960c0a25d8bcd962d4cfee53773a3841dad35f39077894b106a97b88f27d489 47.10MB / 47.10MB 10.5s
=> => extracting sha256:7d63c13d9b9b6ec5f05a2b07daadacaa9c610d01102a662ae9b1d082105f1ffa 3.7s
=> => extracting sha256:225be9814eda07dabebf0e4deb415366f34b2cfe12ef1ad167ba1104423f42d7 0.2s
=> => extracting sha256:c78f8a9ed8840e88c8c3b0627b42a9405d360a5e44b32f2d7fe9a40e02329726 0.0s
=> => extracting sha256:1960c0a25d8bcd962d4cfee53773a3841dad35f39077894b106a97b88f27d489 3.2s
=> [2/3] WORKDIR /app                                                         0.9s
=> [3/3] COPY target/*.jar /app/api.jar                                       0.3s
=> => exporting to image                                                         0.8s
=> => exporting layers                                                         0.8s
=> => writing image sha256:985d4500d12bb788f7bac05fcea6a593a2d0c9d9a8e12d7a45ee95e82979680a 0.0s
=> => naming to docker.io/library/employee                                   0.0s
C:\Users\USER\Desktop\Nova pasta\employeemanager>
```

Docker image tag: renomea uma imagem criada com um outro nome

Docker image rm: remove uma imagem selecionada

Docker image ls: lista as imagens no Docker

Docker network ls: lista a redes default e criadas no Docker

```
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
employee      latest    905d4500d12b  10 minutes ago 266MB
mysql         8.0       9da615fced53  3 weeks ago   514MB
ubuntu        latest    597ce1600cf4  4 weeks ago   72.8MB
hello-world   latest    feb5d9fea6a5  5 weeks ago   13.3kB

C:\Users\USER\Desktop\Nova pasta\employeemanager>docker image tag employee employee-api

C:\Users\USER\Desktop\Nova pasta\employeemanager>docker image rm employee
Untagged: employee:latest

C:\Users\USER\Desktop\Nova pasta\employeemanager>docker network ls
NETWORK ID    NAME        DRIVER    SCOPE
cfbf5e7e60b4  bridge     bridge    local
61cb96399b2c  host       host      local
ce459ecd222a  none       null      local
1e576f236d68  testdocker-network bridge    local

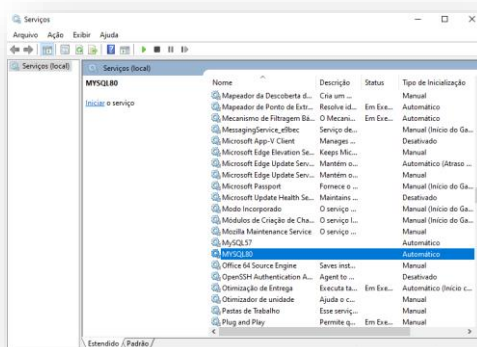
C:\Users\USER\Desktop\Nova pasta\employeemanager>docker network rm ce459ecd222a
Error response from daemon: none is a pre-defined network and cannot be removed

C:\Users\USER\Desktop\Nova pasta\employeemanager>network create --driver bridge testdocker-network
```

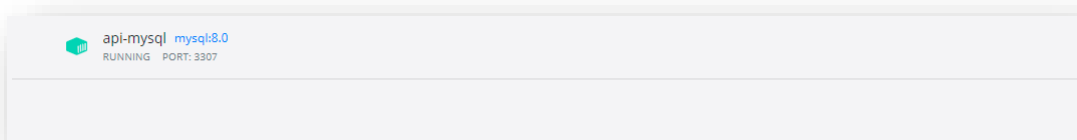
Vamos a criar uma rede contendo MySQL, temos que indicar o porto onde se va executar, se permite senha vazia ou não, o nome da rede e o nome da imagem da base de dados

```
C:\Users\USER\Desktop\Nova pasta\employeemanager>docker container run -d -p 3306:3306 -e MYSQL_ALLOW_EMPTY_PASSWORD=yes --network testdocker-network --name employee-mysql mysql:8.0
```

Antes de iniciar o serviço Docker se deve deter o porto no sistema com o comando `cmd killstat o em services -> mysql 80 ou 57`



Dentro do Docker ativamos a porto onde vai se executar a API



E executamos no cmd a API com o seguinte comando

```
C:\Users\USER\Desktop\Nova pasta\employeemanager>docker container run --rm -p 8080:8080 -e DB_HOST=api-mysql --network testdocker-network employee-api

Spring
=====
:: Spring Boot ::
(2.3.1.RELEASE)

2021-11-04 19:51:04.580 INFO 1 --- [
lication v0.0.1-SNAPSHOT on 34bd5d10357a with PID 1 (/app/api.jar started by root in /app)
2021-11-04 19:51:04.587 INFO 1 --- [
main] t.g.e.EmployeeManagerApplication : No active profile set, falli
ng back to default profiles: default
2021-11-04 19:51:06.735 INFO 1 --- [
A repositories in DEFERRED mode.
2021-11-04 19:51:06.868 INFO 1 --- [
ory scanning in 117ms. Found 1 JPA repository interfaces.
2021-11-04 19:51:08.201 INFO 1 --- [
(s): 8080 (http)
2021-11-04 19:51:08.231 INFO 1 --- [
2021-11-04 19:51:08.231 INFO 1 --- [
ache Tomcat/9.0.36]
2021-11-04 19:51:08.379 INFO 1 --- [
WebApplicationContext
2021-11-04 19:51:08.379 INFO 1 --- [
Initialization completed in 3664 ms
2021-11-04 19:51:08.845 INFO 1 --- [
"applicationTaskExecutor"
2021-11-04 19:51:08.963 INFO 1 --- [
tenceUnInfo [name: default]
2021-11-04 19:51:09.189 WARN 1 --- [
nabled by default. Therefore, database queries may be performed during view rendering. Explicitly configure spring.jpa.open-i
n-view to disable this warning
2021-11-04 19:51:09.179 INFO 1 --- [
e version 5.4.17.Final
2021-11-04 19:51:09.656 INFO 1 --- [
ns Annotations {5.1.0.Final}
2021-11-04 19:51:10.005 INFO 1 --- [
main] t.g.e.EmployeeManagerApplication : Starting EmployeeManagerAppl
main] (/app/api.jar started by root in /app)
main] t.g.e.EmployeeManagerApplication : No active profile set, falli
main] .s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring Data JPA
main] .s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data reposi
main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port
main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
main] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Ap
main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded
main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext:
main] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService
task-1] o.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing Persis
main] JpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is e
task-1] org.hibernate.Version : HHH000412: Hibernate ORM cor
task-1] o.hibernate.annotations.common.Version : HCANW000001: Hibernate Commo
main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8
```