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## Clase 1 Docker

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### 1. Comprobando Docker en el equipo

```
Administrador: Símbolo del sistema
Microsoft Windows [Versión 10.0.19042.1288]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\WINDOWS\system32>docker --version
Docker version 20.10.8, build 3967b7d

C:\WINDOWS\system32>
```

### 2. Comando run para ejecutar una imagen

```
Administrador: Símbolo del sistema
(c) Microsoft Corporation. Todos los derechos reservados.

C:\WINDOWS\system32>docker --version
Docker version 20.10.8, build 3967b7d

C:\WINDOWS\system32>docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

C:\WINDOWS\system32>
```

### 3. Comando pull para descargar imágenes

```
Administrador: Símbolo del sistema
C:\WINDOWS\system32>docker pull busybox
Using default tag: latest
latest: Pulling from library/busybox
01c2cdc13739: Pull complete
Digest: sha256:15e927f78df2cc772b70713543d6b651e3cd8370abf86b2ea4644a9fba21107f
Status: Downloaded newer image for busybox:latest
docker.io/library/busybox:latest

C:\WINDOWS\system32>
```

### 4. Comando images para ver el listado de imágenes instaladas

```
Administrador: Símbolo del sistema
C:\WINDOWS\system32>docker pull busybox
Using default tag: latest
latest: Pulling from library/busybox
01c2cdc13739: Pull complete
Digest: sha256:15e927f78df2cc772b70713543d6b651e3cd8370abf86b2ea4644a9fba21107f
Status: Downloaded newer image for busybox:latest
docker.io/library/busybox:latest

C:\WINDOWS\system32>docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
busybox        latest    cabb9f684f8b   3 days ago    1.24MB
hello-world    latest    feb5d9fea6a5   5 weeks ago    13.3kB
busybox        <none>    16ea53ea7c65   6 weeks ago    1.24MB

C:\WINDOWS\system32>
```

### 5. Comando run con algunos parámetros

```
Administrador: Símbolo del sistema
busybox        <none>    16ea53ea7c65   6 weeks ago    1.24MB

C:\WINDOWS\system32>docker run busybox

C:\WINDOWS\system32>docker run busybox echo "Hello From Galileo Master!"
Hello From Galileo Master!

C:\WINDOWS\system32>
```

### 6. Comando ps -a para ver contenedores ejecutados anteriormente

```
Administrador: Símbolo del sistema
C:\WINDOWS\system32>docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
C:\WINDOWS\system32>docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
From Ga..." About a minute ago    Exited (0) About a minute ago    hungry_wilbur
cb30b8761dfc   busybox    "sh"                    2 minutes ago    Exited (0) 2 minutes ago        intelligent_elion
59b49f131e1a   hello-world "/hello"               18 minutes ago    Exited (0) 18 minutes ago        wizardly_ishizaka
deb0f2035bce   16ea53ea7c65 "sh"                   2 weeks ago      Exited (2) 2 weeks ago        elastic_keller
0c8400b9b468   16ea53ea7c65 "echo 'Hello From Ga..." 2 weeks ago      Exited (0) 2 weeks ago        goofy_easley
bca52515a048   16ea53ea7c65 "sh"                   2 weeks ago      Exited (0) 2 weeks ago        confident_sanderson
52cfa7ceb6c3   hello-world "/hello"               2 weeks ago      Exited (0) 2 weeks ago        stupefied_robinson
7c6417ced9b4   hello-world "/hello"               2 weeks ago      Exited (0) 2 weeks ago        admiring_matsumoto

C:\WINDOWS\system32>
```

## 7. Ingresando al contenedor

```
C:\WINDOWS\system32>docker run -it busybox sh
# ls
bin dev etc home proc root sys tmp usr var
# optane
sh: optane: not found
# uptime
17:38:51 up 9:28, 0 users, load average: 0.00, 0.00, 0.00
# cd home
home # ls
home # cd ..
# cd var/
var # ls
pool www
var # exit
```

## 8. Comando rm para borrar contenedores

```
Administrador: Símbolo del sistema

C:\WINDOWS\system32>docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS   NAMES
9d05dad3ac10   busybox    "sh"                    4 minutes ago Exited (0) 58 seconds ago      suspicious_jackson
88c41e5f873a   busybox    "echo 'Hello From Ga..." 8 minutes ago Exited (0) 8 minutes ago      hungry_wilbur
cb30b8761dfc   busybox    "sh"                    8 minutes ago Exited (0) 8 minutes ago      intelligent_elion
59b49f131e1a   hello-world "/hello"                25 minutes ago Exited (0) 25 minutes ago      wizardly_ishizaka
deb0f2035bce   16ea53ea7c65 "sh"                    2 weeks ago   Exited (2) 2 weeks ago      elastic_keller
0c8400b9b468   16ea53ea7c65 "echo 'Hello From Ga..." 2 weeks ago   Exited (0) 2 weeks ago      goofy_easley
bca52515a048   16ea53ea7c65 "sh"                    2 weeks ago   Exited (0) 2 weeks ago      confident_sanderson
52cfa7ceb6c3   hello-world "/hello"                2 weeks ago   Exited (0) 2 weeks ago      stupefied_robinson
7c6417ced9b4   hello-world "/hello"                2 weeks ago   Exited (0) 2 weeks ago      admiring_matsumoto

C:\WINDOWS\system32>docker rm 9d05dad3ac10 88c41e5f873a
9d05dad3ac10
88c41e5f873a

C:\WINDOWS\system32>docker rm intelligent_elion
intelligent_elion

C:\WINDOWS\system32>
```

## 9. Descargando la imagen jupyter/base-notebook

```
Administrador: Símbolo del sistema

C:\WINDOWS\system32>docker pull jupyter/base-notebook
Using default tag: latest
latest: Pulling from jupyter/base-notebook
7b1a6ab2e44d: Pull complete
aae7ac7ba423: Pull complete
ac5e015e0bca: Pull complete
d7ee77f7580c: Pull complete
a5db759ff9c8: Pull complete
c464ee64836c: Pull complete
ae5313d07705: Pull complete
0c52b58dd46b: Pull complete
6030cc7cf343: Pull complete
25203b1e1be1: Pull complete
464a3cf035e8: Pull complete
Digest: sha256:5876e42c22c5df950880518f13f9c8e08b2c8fd50d1072519887735c14ee63f7
Status: Downloaded newer image for jupyter/base-notebook:latest
docker.io/jupyter/base-notebook:latest

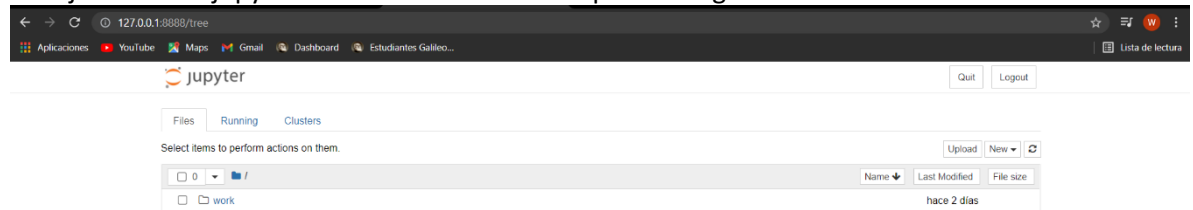
C:\WINDOWS\system32>
```

## 10. Mapeo de puertos

```
Administrador: Símbolo del sistema - docker run -p 8888:8888 jupyter/base-notebook
C:\WINDOWS\system32>docker run -p 8888:8888 jupyter/base-notebook
WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-stacks#jupyter-notebook-deprecation-notice.
Executing the command: jupyter notebook
[I 17:51:54.368 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-30 17:51:55.365 LabApp] 'ip' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 17:51:55.365 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 17:51:55.365 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 17:51:55.365 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[I 2021-10-30 17:51:55.383 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 17:51:55.383 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 17:51:55.396 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 17:51:55.396 NotebookApp] Jupyter Notebook 6.4.5 is running at:
[I 17:51:55.396 NotebookApp] http://427e4191a1a9:8888/?token=1e82d3a925a616e492c667aa7e1f536011b4eb204b1f7714
[I 17:51:55.396 NotebookApp] or http://127.0.0.1:8888/?token=1e82d3a925a616e492c667aa7e1f536011b4eb204b1f7714
[I 17:51:55.396 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 17:51:55.406 NotebookApp]

To access the notebook, open this file in a browser:
file:///home/jovyan/.local/share/jupyter/runtime/nbserver-8-open.html
Or copy and paste one of these URLs:
http://427e4191a1a9:8888/?token=1e82d3a925a616e492c667aa7e1f536011b4eb204b1f7714
or http://127.0.0.1:8888/?token=1e82d3a925a616e492c667aa7e1f536011b4eb204b1f7714
```

## 11. Ejecución de jupyter en el contenedor con el puerto asignado



## 12. Creando una network (driver bridge)

```
Administrador: Símbolo del sistema
C:\WINDOWS\system32>docker network create --driver bridge my_test_network2
760add47bd50d1d80cf68379604bf9abd44f48d2884284595a072a4bbd6971bb
C:\WINDOWS\system32>
```

## 13. Contenedor mysql instalado

```
Administrador: Símbolo del sistema
Microsoft Windows [Versión 10.0.19042.1288]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\WINDOWS\system32>docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
x45869fb2d99   mysql:5.7.35  "docker-entrypoint.s..."  2 minutes ago  Up 2 minutes  0.0.0.0:3306->3306/tcp, 33060/tcp  ecstatic_ride
3120ff513b27   jupyter/base-notebook  "tini -g -- start-no..."  15 minutes ago  Up 15 minutes  0.0.0.0:8888->8888/tcp             hardcore_shannon
```

## 14. Contenedores funcionando en la misma red

```
(c) Microsoft Corporation. Todos los derechos reservados.

C:\WINDOWS\system32>docker run -p 8888:8888 --network my_test_network2 jupyter/base-notebook
WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-stacks#jupyter-notebook-deprecation-notice.
Executing the command: jupyter notebook
[I 18:49:22.780 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-30 18:49:23.658 LabApp] 'ip' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 18:49:23.658 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 18:49:23.658 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-30 18:49:23.658 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[I 2021-10-30 18:49:23.668 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 18:49:23.668 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 18:49:23.675 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 18:49:23.675 NotebookApp] Jupyter Notebook 6.4.5 is running at:
[I 18:49:23.675 NotebookApp] http://1df93f0db8ac:8888/?token=d511b509a5ebe0c1bb0e99b357a2a15e5397d6b60989eba4
[I 18:49:23.675 NotebookApp] or http://127.0.0.1:8888/?token=d511b509a5ebe0c1bb0e99b357a2a15e5397d6b60989eba4
[I 18:49:23.676 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 18:49:23.681 NotebookApp]

To access the notebook, open this file in a browser:
file:///home/jovyan/.local/share/jupyter/runtime/nbserver-7-open.html
Or copy and paste one of these URLs:
http://1df93f0db8ac:8888/?token=d511b509a5ebe0c1bb0e99b357a2a15e5397d6b60989eba4
or http://127.0.0.1:8888/?token=d511b509a5ebe0c1bb0e99b357a2a15e5397d6b60989eba4
```

## 15. Instalando mysql-connector dentro del contenedor

```
http://1df93f0db8ac:8888/?token=d511b509a5ebe0c1bb0e99b357a2a15e5397d6b60989eba4
Administrador: Símbolo del sistema - docker exec -it stoic_montalcini sh
Microsoft Windows [Versión 10.0.19042.1288]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\WINDOWS\system32>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
1df93f0db8ac   jupyter/base-notebook   "tiny -g -- start-no..."   3 minutes ago   Up 3 minutes   0.0.0.0:8888->8888/tcp    stoic_montalcini

C:\WINDOWS\system32>docker exec it stoic_montalcini sh
Error: No such container: it

C:\WINDOWS\system32>docker exec -it stoic_montalcini sh
$ pip install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.27-1commercial-cp39-cp39-manylinux1_x86_64.whl (37.5 MB)
    |#####| 37.5 MB 94 kB/s
Collecting protobuf<=3.0.0
  Downloading protobuf-3.19.1-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.1 MB)
    |#####| 1.1 MB 2.8 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.1
```

## 16. Instalando otras librerías dentro del contenedor

```
Administrador: Símbolo del sistema - docker exec -it stoic_montalcini sh

C:\WINDOWS\system32>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
1df93f0db8ac   jupyter/base-notebook   "tiny -g -- start-no..."   3 minutes ago   Up 3 minutes   0.0.0.0:8888->8888/tcp    stoic_montalcini

C:\WINDOWS\system32>docker exec it stoic_montalcini sh
Error: No such container: it

C:\WINDOWS\system32>docker exec -it stoic_montalcini sh
$ pip install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.27-1commercial-cp39-cp39-manylinux1_x86_64.whl (37.5 MB)
    |#####| 37.5 MB 94 kB/s
Collecting protobuf<=3.0.0
  Downloading protobuf-3.19.1-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.1 MB)
    |#####| 1.1 MB 2.8 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.1
$ pip install pandas
Collecting pandas
  Downloading pandas-1.3.4-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (11.5 MB)
    |#####| 11.5 MB 1.0 MB/s
Collecting numpy>=1.17.3
  Downloading numpy-1.21.3-cp39-cp39-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (15.7 MB)
    |#####| 15.7 MB 1.9 MB/s
Requirement already satisfied: python-dateutil<=2.7.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2021.3)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.9/site-packages (from python-dateutil<=2.7.3->pandas) (1.16.0)
Installing collected packages: numpy, pandas
```