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CREATE CHANGE

# Software Containers

Hands-on

Steffen Bollmann

School of Information Technology and Electrical Engineering

The University of Queensland

# Hello world of Docker – Hands on

If docker installed on your computer:

 Windows PowerShell

```
docker run hello-world
```

```
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
0e03bdcc26d7: Already exists
Digest: sha256:d58e752213a51785838f9eed2b7a498ffa1cb3aa7f946dda11af39286c3db9a9
Status: Downloaded newer image for hello-world:latest
```

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

If docker not installed:

<https://labs.play-with-docker.com/>



+ ADD NEW INSTANCE

```
[node1] (local) root@192.168.0.8 ~
$ docker run hello-world
```

```
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:cc15c5b292d8525effc0f89cb299f1804f3a725c8d05e158653a563f15e4f685
Status: Downloaded newer image for hello-world:latest
```

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

# Hello world of Docker – Hands on

Docker caches the images locally 😊 So, running it again, will be faster!



```
PS C:\Users\uqsbollm> docker run hello-world
```

```
Hello from Docker!
```

```
This message shows that your installation appears to be working correctly.
```

# Show downloaded images

The caching of images can fill up your hard drive ...



```
PS C:\Users\uqsbollm> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
<none>	<none>	9fdb2ebb1a4	19 hours ago	125MB
ubuntu	16.04	005d2078bdfa	7 weeks ago	125MB
gigantum/labmanager	fa7d5e79	ec37c9898625	4 months ago	962MB
hello-world	latest	bf756fb1ae65	5 months ago	13.3kB

in windows all docker images are stored in a single hyper-v virtual machine disk at:  
C:\ProgramData\DockerDesktop\vm-data\DockerDesktop.vhdx

# Clean up docker images

```
PS C:\Users\uqsbollm> docker rmi -f hello-world
Untagged: hello-world:latest
Untagged: hello-world@sha256:d58e752213a51785838f9eed2b7a498ffa1cb3aa7f946dda11af3928
Deleted: sha256:bf756fb1ae65adf866bd8c456593cd24beb6a0a061dedf42b26a993176745f6b
```

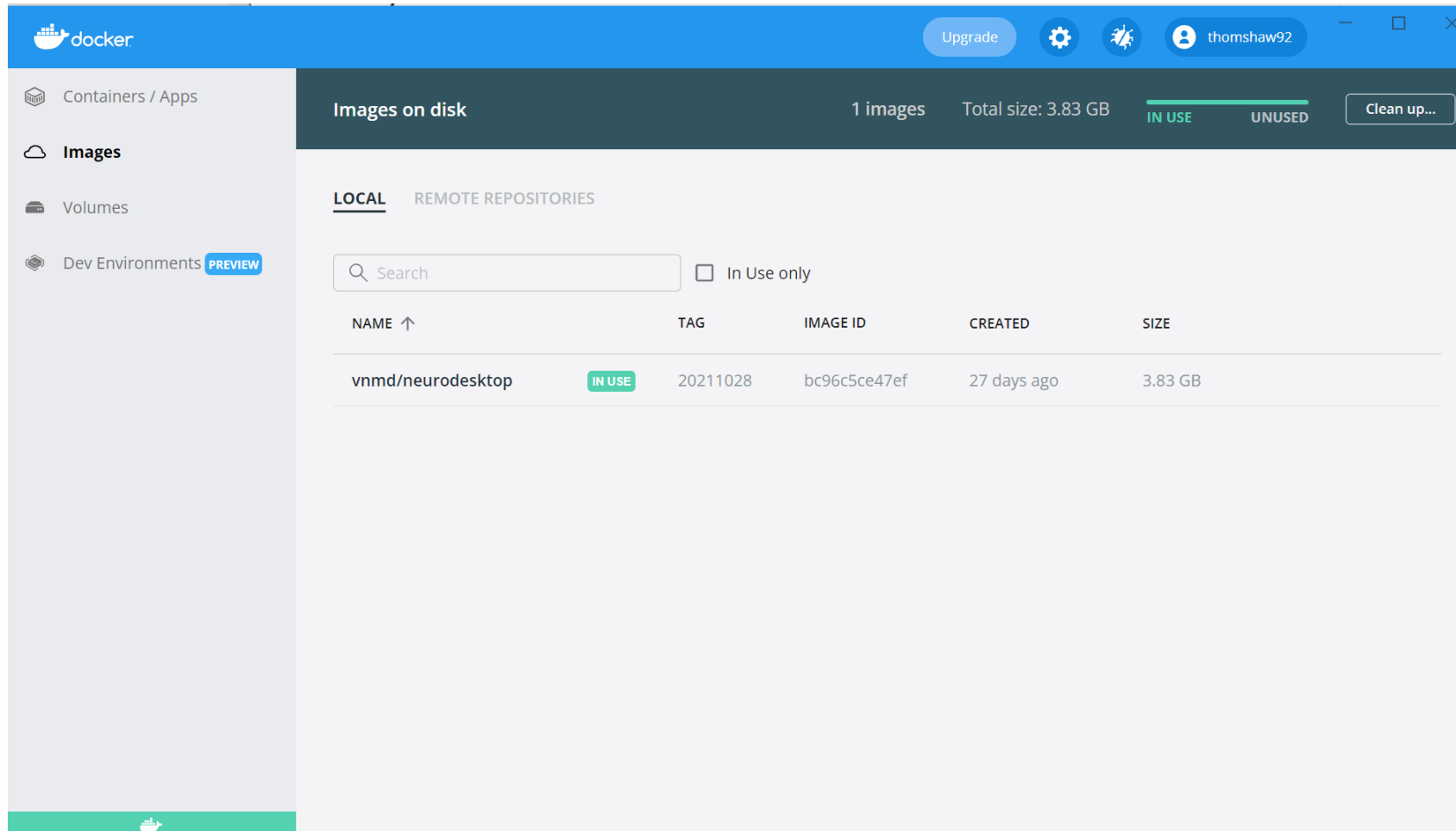


```
PS C:\Users\uqsbollm> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
<none>	<none>	9fdb2ebb1a4	19 hours ago	125MB
ubuntu	16.04	005d2078bdfa	7 weeks ago	125MB
gigantum/labmanager	fa7d5e79	ec37c9898625	4 months ago	962MB

sometimes it can help to remove ALL images, this can be done using: **docker rmi \$(docker images -q) --force**

# Clean-up via Docker Desktop



**Images on disk** 1 images Total size: 3.83 GB IN USE UNUSED [Clean up...](#)

**LOCAL** REMOTE REPOSITORIES

Search ☐ In Use only

NAME ↑	TAG	IMAGE ID	CREATED	SIZE	
vnmd/neurodesktop	<span>IN USE</span>	20211028	bc96c5ce47ef	27 days ago	3.83 GB



# Let's write our own docker file 😊

```
[node3] (local) root@192.168.0.16 ~  
$ touch Dockerfile
```



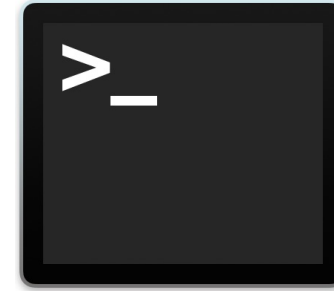
EDITOR

# For those on command line (native Docker install)

For Linux distros (Ubuntu, etc)

MacOs (via Terminal)

Or Windows Subsystem for Linux users:



1. Open the terminal application in Linux or Unix
2. Next, open a file in vim / vi, type: `vim filename`
3. To save a file in Vim / vi, press `Esc` key, type `:w` and hit `Enter` key
4. One can save a file and quit vim / Vi by pressing `Esc` key, type `:x` and hit `Enter` key

```
touch Dockerfile
vi Dockerfile
```

Or, just navigate to the directory in command line!

e.g.,

```
cd /mnt/c/Users/Thom/Downloads/
```

Or wherever the path is to the downloaded docker file

(hint – you are in the pwd)



# Our Dockerfile:

Dockerfile ✕



Save



Reload

```
1 FROM ubuntu:16.04
2
3 RUN apt-get update -qq \
4     && apt-get install -y curl \
5     && rm -rf /var/lib/apt/lists/*
6 WORKDIR /opt/ants-2.3.4
7 RUN curl -fsSL https://bit.ly/ants234 | tar -xz -C /opt/ants-2.3.4 --strip-components 1
8 ENV PATH=/opt/ants-2.3.4:$PATH
9 ENV ANTSPATH="/opt/ants-2.3.4/"
```

## Let's build our own container

```
docker build -t ants:latest -f Dockerfile .
```

container\_name:tag

Dockerfile name

Build context

```
Sending build context to Docker daemon    47MB
Step 1/8 : FROM ubuntu:16.04
16.04: Pulling from library/ubuntu
58690f9b18fc: Pull complete
b51569e7c507: Pull complete
da8ef40b9eca: Pull complete
fb15d46c38dc: Pull complete
Digest: sha256:0f71fa8d4d2d4292c3c617fda2b36f6dabe5c8b6e34c3dc5b0d17d4e704bd39c
Status: Downloaded newer image for ubuntu:16.04
---> b6f507652425
Step 2/8 : RUN apt-get update
---> Running in 2773af14e0a2
Get:1 http://archive.ubuntu.com/ubuntu xenial InRelease [247 kB]
Get:2 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
```

# For those with Docker installed on Windows (No WSL)

 Windows PowerShell

`notepad.exe Dockerfile`

```
Dockerfile.txt - Notepad
File Edit Format View Help
FROM ubuntu:16.04

RUN apt-get update -qq \
    && apt-get install -y curl \
    && rm -rf /var/lib/apt/lists/*
WORKDIR /opt/ants-2.3.4
RUN curl -fsSL https://bit.ly/ants234 | tar -xz -C /opt/ants-2.3.4 --strip-components 1
ENV PATH=/opt/ants-2.3.4:$PATH
ENV ANTSPATH="/opt/ants-2.3.4/"
```

`docker build -t ants:latest -f .\Dockerfile .`

container\_name:tag

Dockerfile name Build context

# Let's run our own container 😊

```
[node3] (local) root@192.168.0.16 ~  
$ ImageMath  
bash: ImageMath: command not found
```

```
docker run -it ants:latest
```

```
root@a8b59c2ae9e0:/opt/ants-2.3.4# ImageMath  
Usage: ImageMath ImageDimension <OutputImage.ext>
```

# Let's share our image with the rest of the world 😊

First, exit the container with CTRL-D or CTRL-C

Then we need to login to Dockerhub:

```
[node1] (local) root@192.168.0.8 ~  
$ docker login  
Login with your Docker ID to push and pull images from Docker Hub. If you don't have one.  
Username: stebo85  
Password:  
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.  
Configure a credential helper to remove this warning. See  
https://docs.docker.com/engine/reference/commandline/login/#credentials-store  
  
Login Succeeded
```

# Let's share our image with the rest of the world 😊

Then we need to tag the image with our docker username:

```
[node3] (local) root@192.168.0.16 ~  
$ docker image tag ants:latest stebo85/ants:latest
```





# Questions?

