

docker



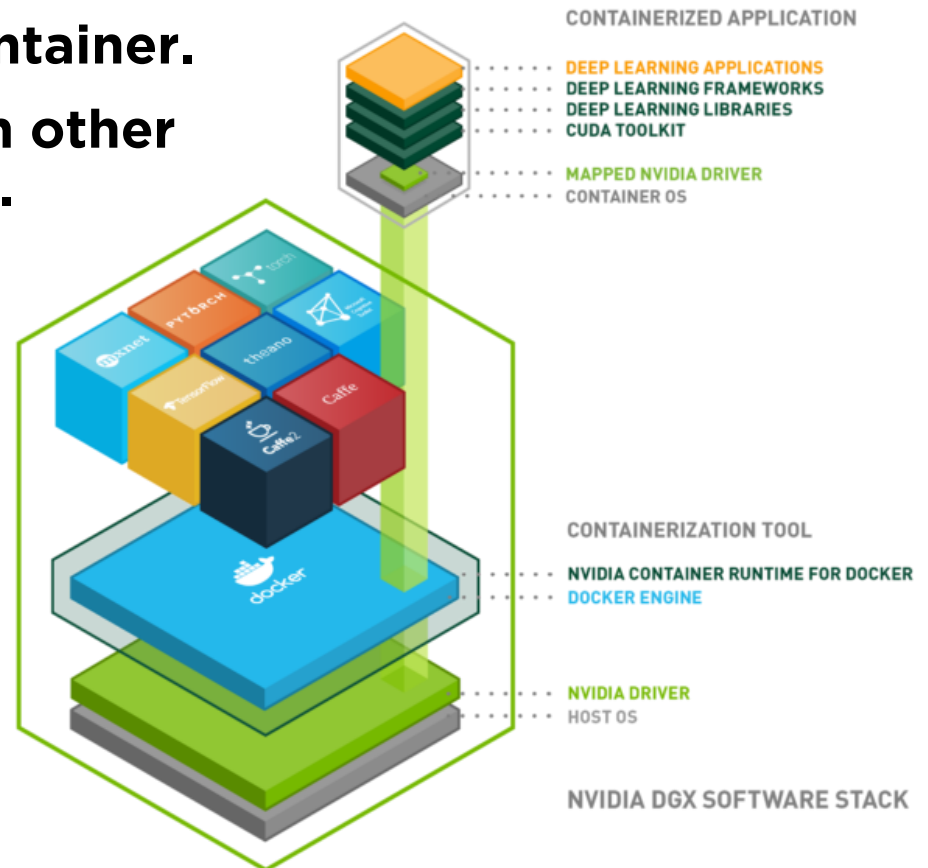
Getting Started with Docker

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Docker

- **Docker creates isolated environment called a Container.**
- **Install and run apps in a container.**
- **Containers are deployed on other machines by sharing image.**
- **Enterprises love it.**



Why use Docker over Conda?

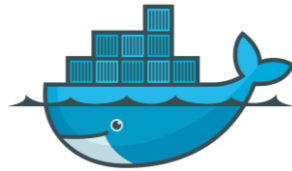
- **Consistent environments across multiple machines.
(2GPU → 4GPU)**
- **Multiple isolated environments in a shared machine.**
- **Abstracts more than just Python apps.**
- **You will need it when running others' code, or publishing your code.**
- **Safely mess with Linux.**
- **Example:**

<https://github.com/feidfoe/learning-not-to-learn>

Things to note

- **Nvidia-docker does not support Windows.**

Docker vs. Git



| Docker | Git |
|-----------------------------|----------------------------|
| Image | Code |
| Container | Process |
| <code>hub.docker.com</code> | <code>github.com</code> |
| <code>docker pull</code> | <code>git clone</code> |
| <code>docker run</code> | <code>python run.py</code> |
| <code>docker commit</code> | <code>git commit</code> |
| <code>docker push</code> | <code>git push</code> |

Tutorial

Create your image and publish on Docker Hub

Now we'll create a docker image

- **Two ways to do this:**
 - **By committing container to image.**
 - **By writing and running a script called “Dockerfile”.**
- **We will cover the former method.**

First things first...

- **Sign up on hub.docker.com**
- **Create a new repo and name it pytorch.**

1. Pull the pytorch image from Docker Hub.

```
$ docker pull pytorch/pytorch
```

2. Run a pytorch container.

```
$ docker run --gpus all -it -p 5000:8888 --name MyContainer pytorch/pytorch
```

3. Install your apps and packages.

```
$ apt update  
$ apt install vim tmux git wget  
$ pip install opencv-python pillow tqdm
```

4. Install Jupyter.

```
$ pip install jupyterlab  
$ jupyter notebook --generate-config
```

5. Configure Jupyter.

```
$ vim ~/.jupyter/jupyter_notebook_config.py  
set c.NotebookApp.ip to '0.0.0.0'
```

Before you commit...

1. Make sure that your setup works.

```
>>> import cv2, PIL  
>>> import torch  
>>> print(torch.cuda.is_available())
```

```
$ jupyter-lab
```

2. Press CTRL+P+Q to detach from container.

3. Stop the container.

```
$ docker stop MyContainerName
```

Commit and push

1. Commit your container into an image.

```
$ docker commit MyContainerName MyAccount/pytorch  
$ docker push MyAccount/pytorch
```

2. Login to Docker Hub.

```
$ docker login
```

3. Push to repository.

```
$ docker push MyAccount/pytorch
```

4. Check your repository on Docker Hub.

5. Don't forget to logout.

```
$ docker logout
```

Benefit from Docker

- **You can run container from any server.**
- **You can run multiple containers from a server.**

```
$ docker run --gpus all -it  
    -v HostDir:/workspace  
    -p 5000:8888  
    --name MyContainer  
    pytorch/pytorch
```

Cheat Sheet

| COMMAND | DESCRIPTION |
|---|---------------------------------|
| <code>docker pull [image]</code> | Download image from the Hub |
| <code>docker run [image]</code> | Start a container |
| <code>CTRL+P+Q</code> <code>docker attach [container]</code> | Detach from/attach to container |
| <code>docker ps -a</code> <code>docker container list -a</code> | List all containers |
| <code>docker start [container]</code> <code>docker stop [container]</code> | Start/stop container |
| <code>docker rm [container]</code> | Remove container |
| <code>docker image list</code> | List docker images |