Object Detection API on Tensorflow for Demo

Main Repositories

DockerHub : https://hub.docker.com/u/qhub Github : https://github.com/qpjkw/tfod_ces2019.git Tensorflow Object Detection API : https://github.com/tensorflow/models/tree/master/research/object_detection

Build container images

Make sure you have already imported the customized docker image into container station. You can pull images from Dockerhub repository. In this tutorial, we recommend GPU-based docker image.

CUDA 9 :

```
docker pull qhub/tfod-ces2019:1.0-gpu
```

CUDA 10 :

Download dockerfile and put to NAS `Public` folder : DockerFile-CUDA10

```
cd /share/Public
docker build --rm --tag=qhub/tfod-ces2019:1.13-gpu --file=Dockerfile-GPU .
```

Starting a container

Use command

And then instantiate a container via the below command.

CUDA 9 :

```
docker run --rm -it --name ces2019gpu --ipc=host -p 28888:8888 -p 26006:6006 --device
/dev/nvidia0:/dev/nvidia0 --device /dev/nvidiactl:/dev/nvidiactl --device /dev/nvidia-
uvm:/dev/nvidia-uvm -v /share/CACHEDEV1_DATA/.qpkg/NVIDIA_GPU_DRV/usr/:/usr/local/nvidia
qhub/tfod-ces2019:1.0-gpu
```

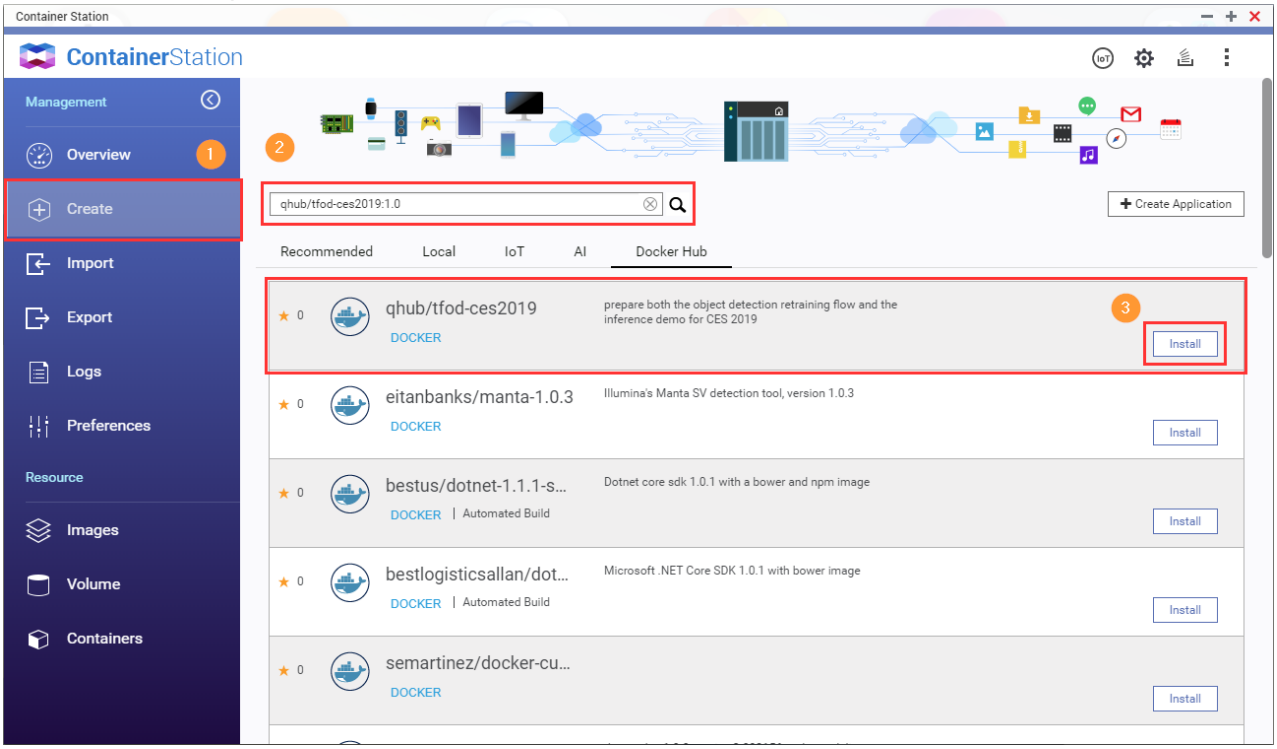
CUDA 10 :

```
docker run --rm -it --name ces2019gpu --ipc=host -p 28888:8888 -p 26006:6006 --device
/dev/nvidia0:/dev/nvidia0 --device /dev/nvidiactl:/dev/nvidiactl --device /dev/nvidia-
uvm:/dev/nvidia-uvm -v /share/CACHEDEV1_DATA/.qpkg/NVIDIA_GPU_DRV/usr/:/usr/local/nvidia
qhub/tfod-ces2019:1.13-gpu
```

Use web GUI

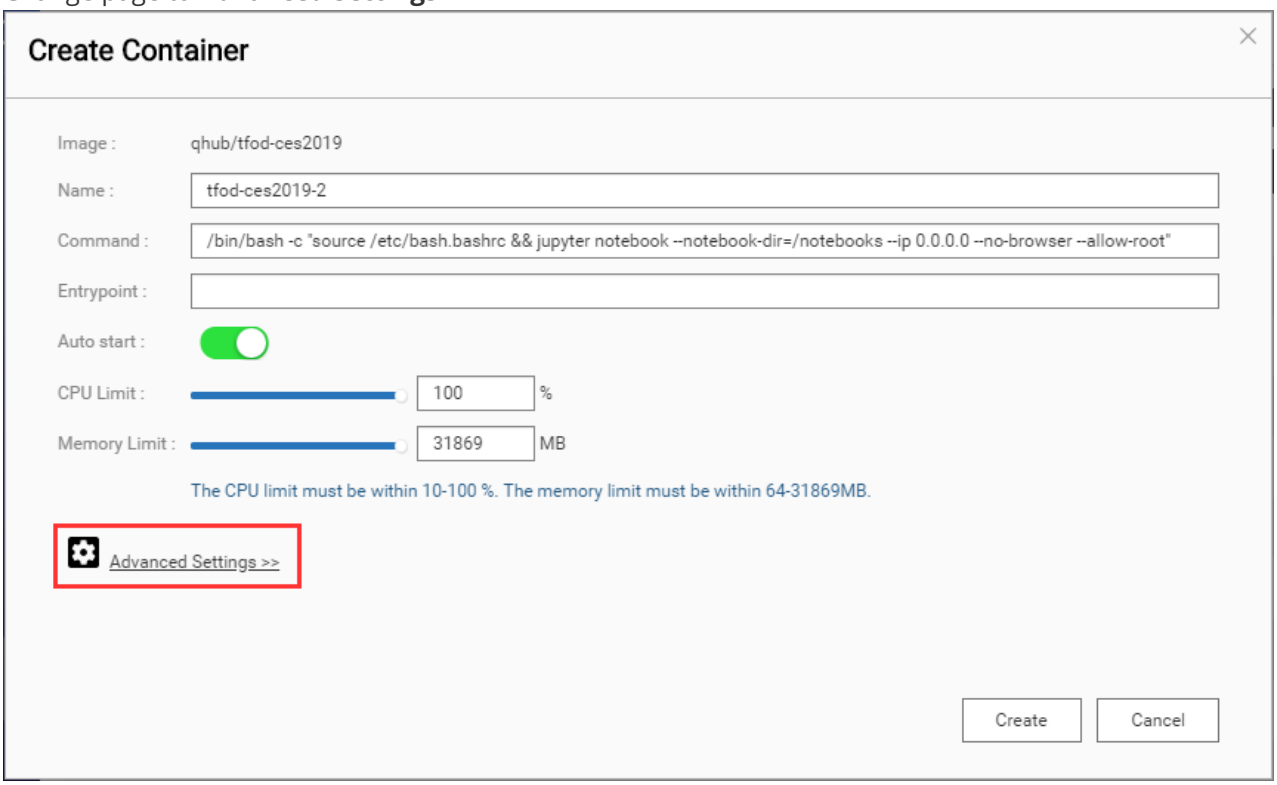
CUDA 9 :

1. Search docker image from docker hub

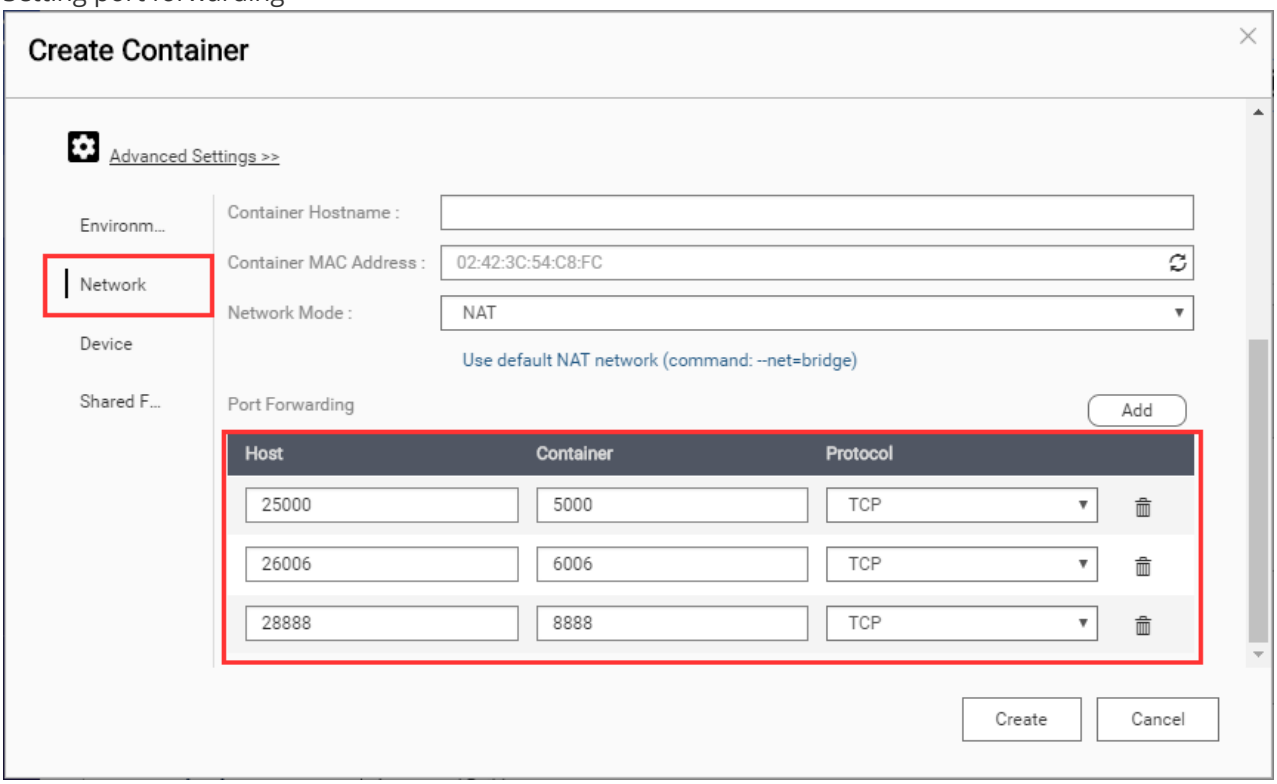


2. Choice docker image tag (version)

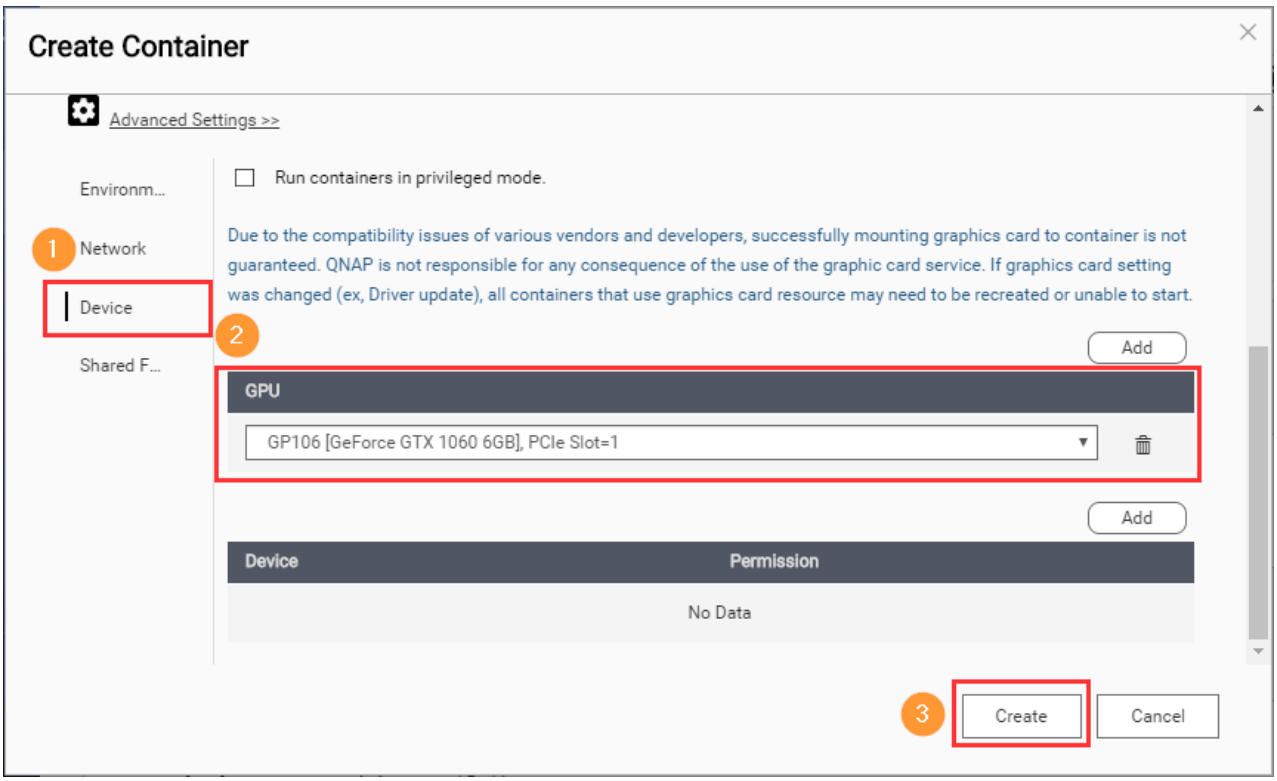
3. Change page to **Advanced Settings**



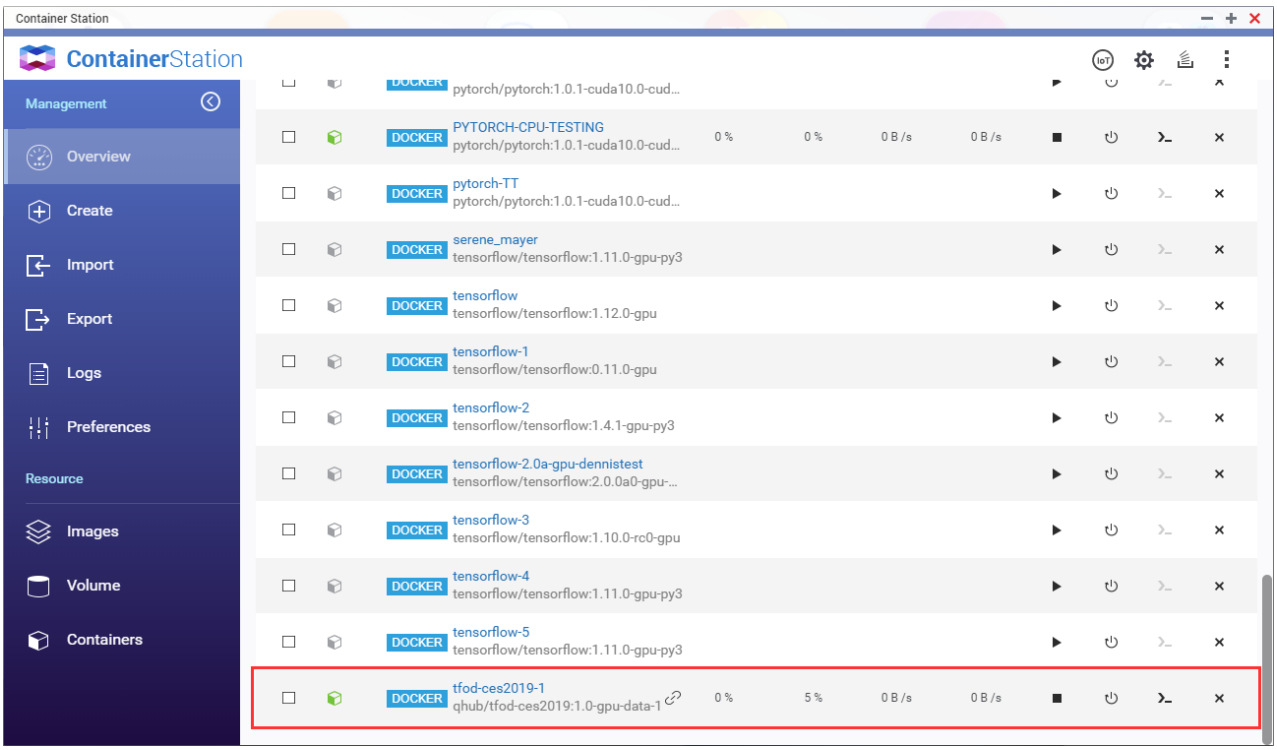
4. Setting port forwarding



5. Mount GPU card

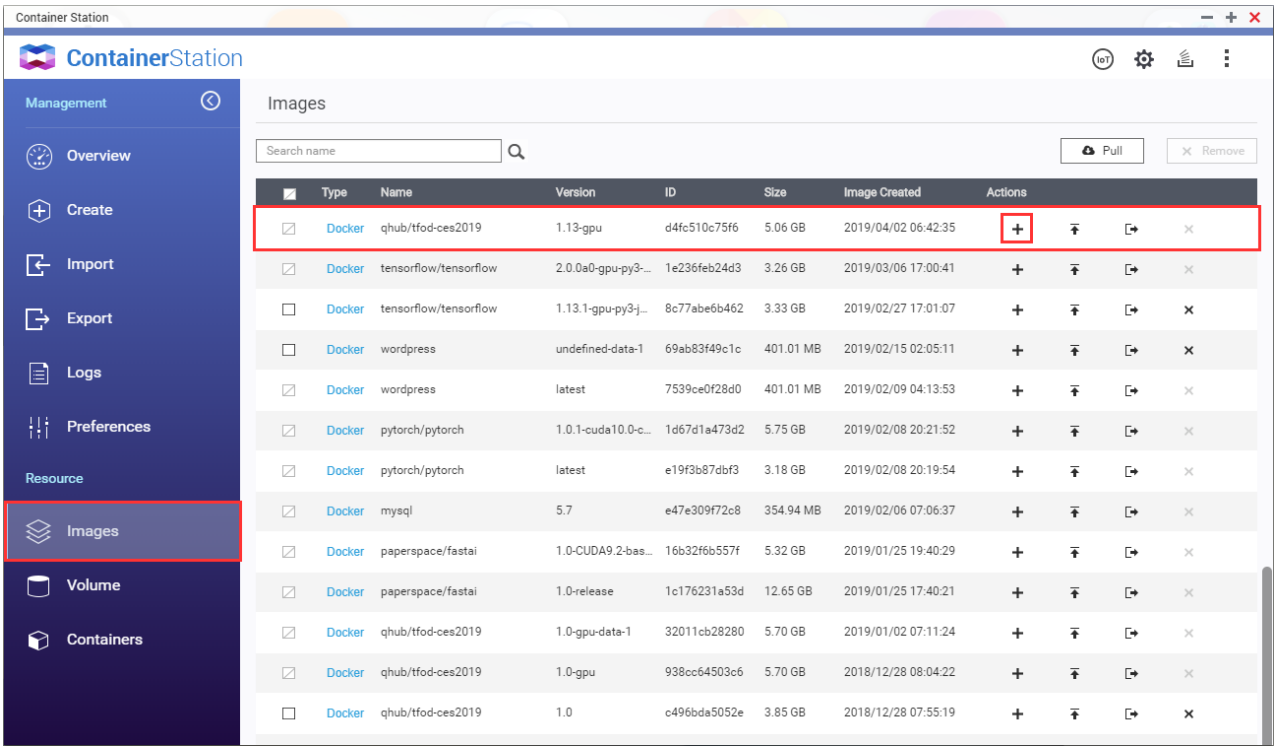


6. Created container

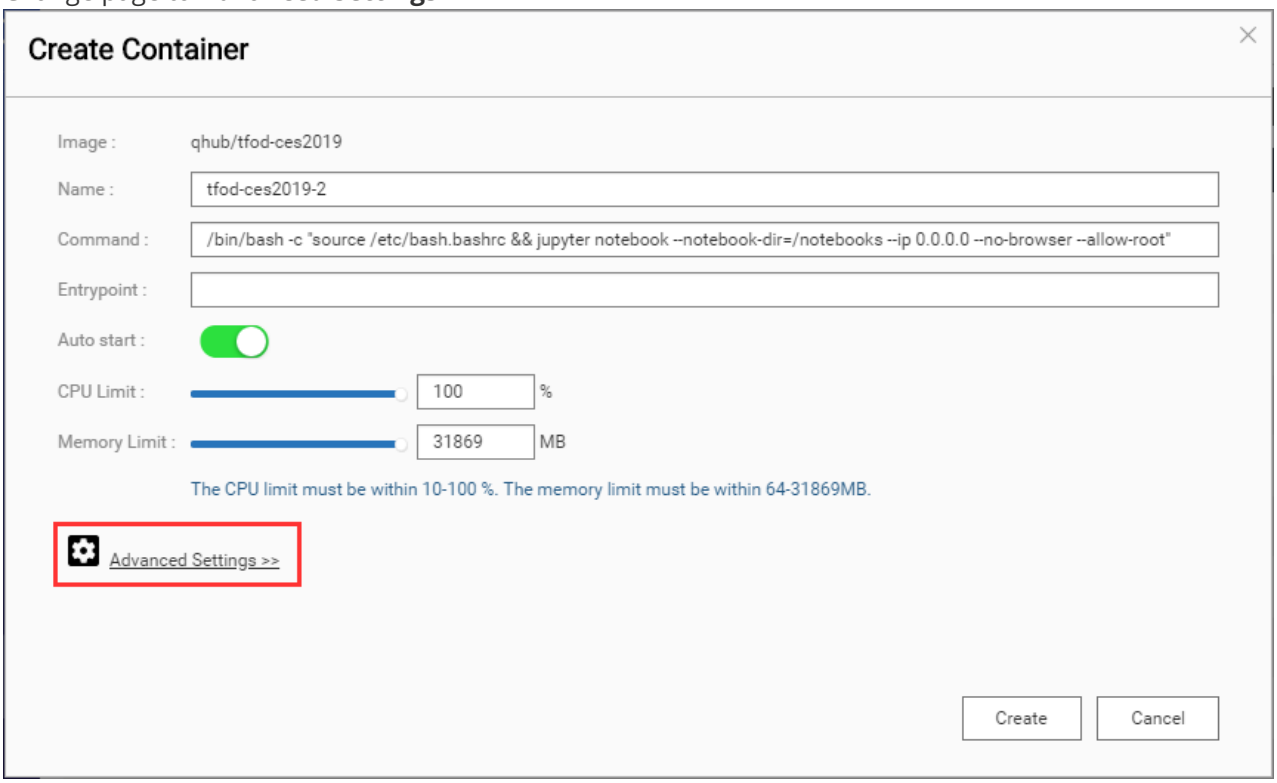


CUDA 10 :

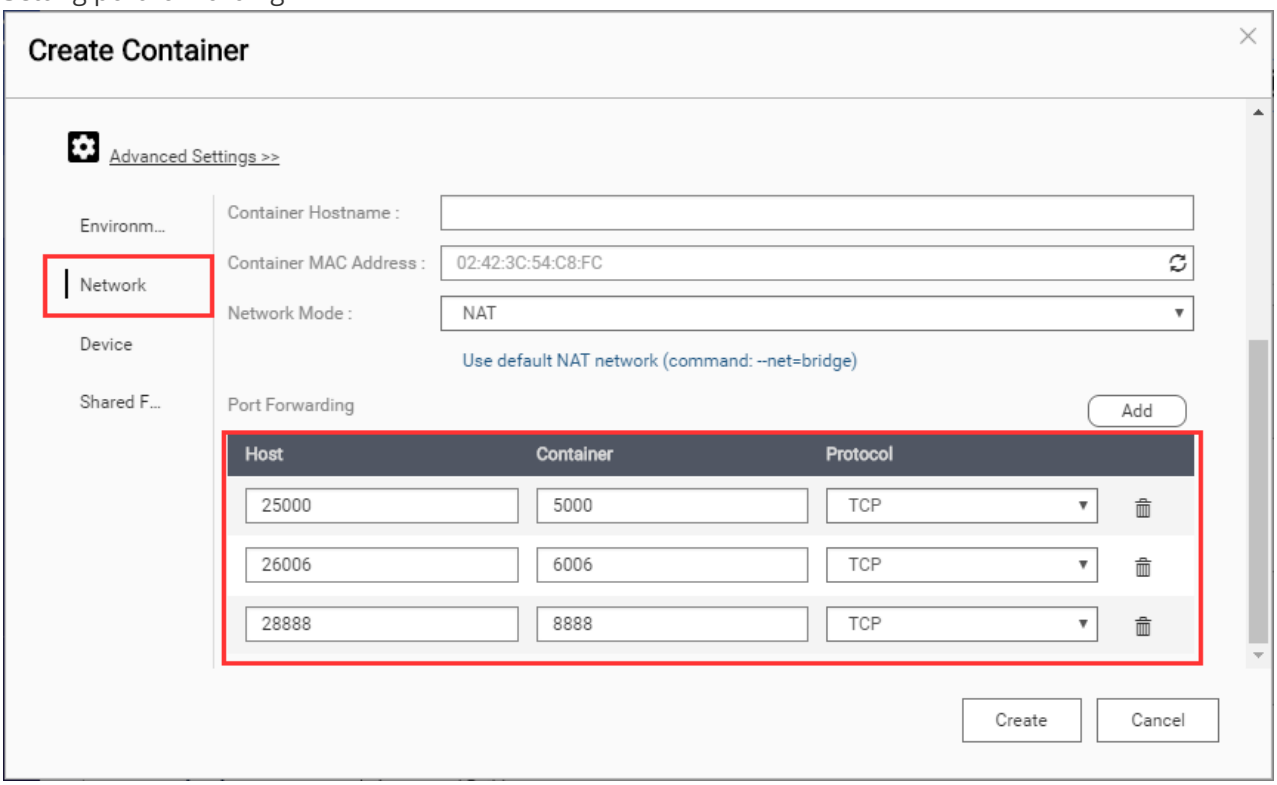
1. Change to **images** page and create `qhub/tfod-ces2019:1.13-gpu` container



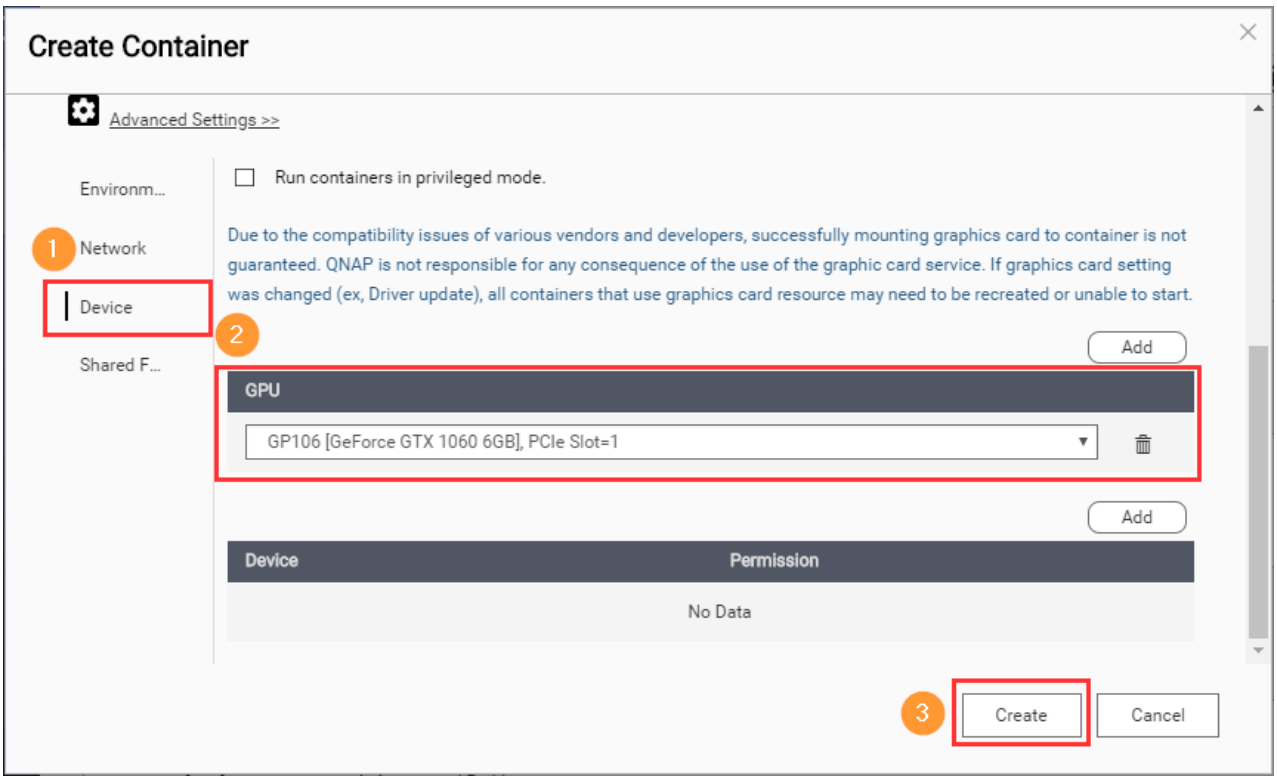
2. Change page to **Advanced Settings**



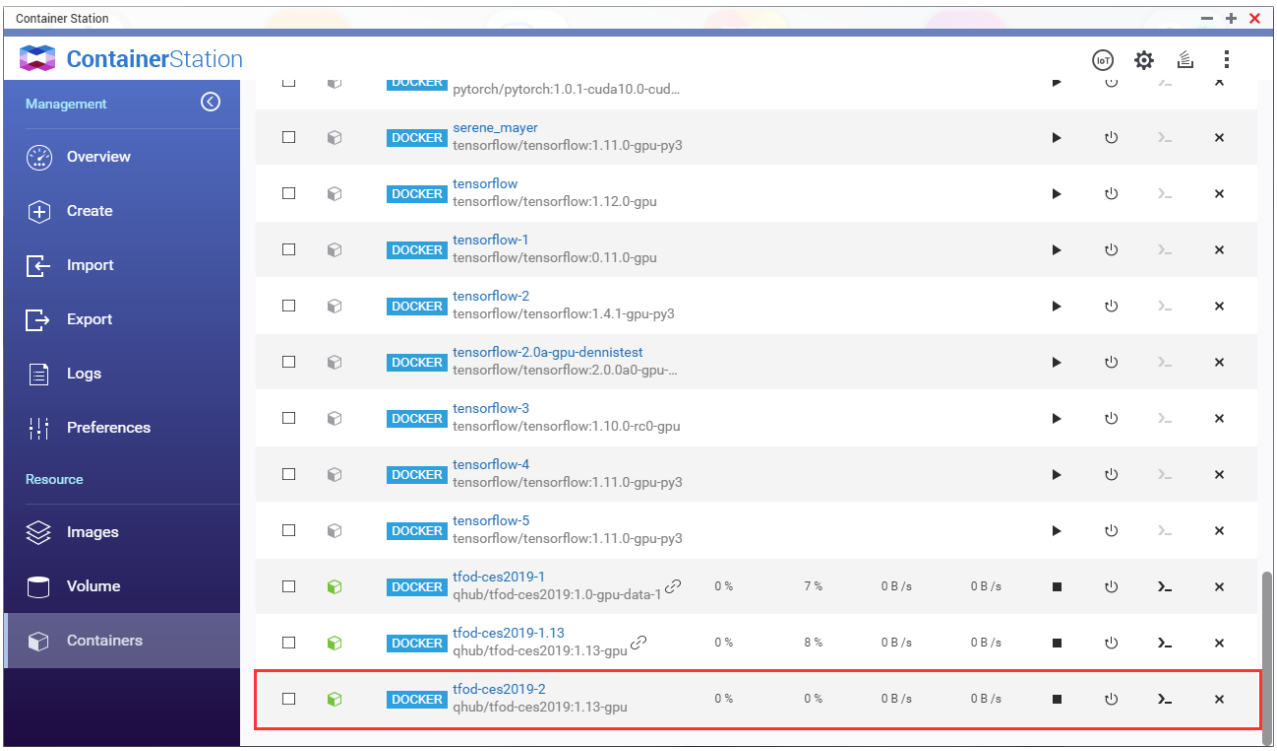
3. Setting port forwarding



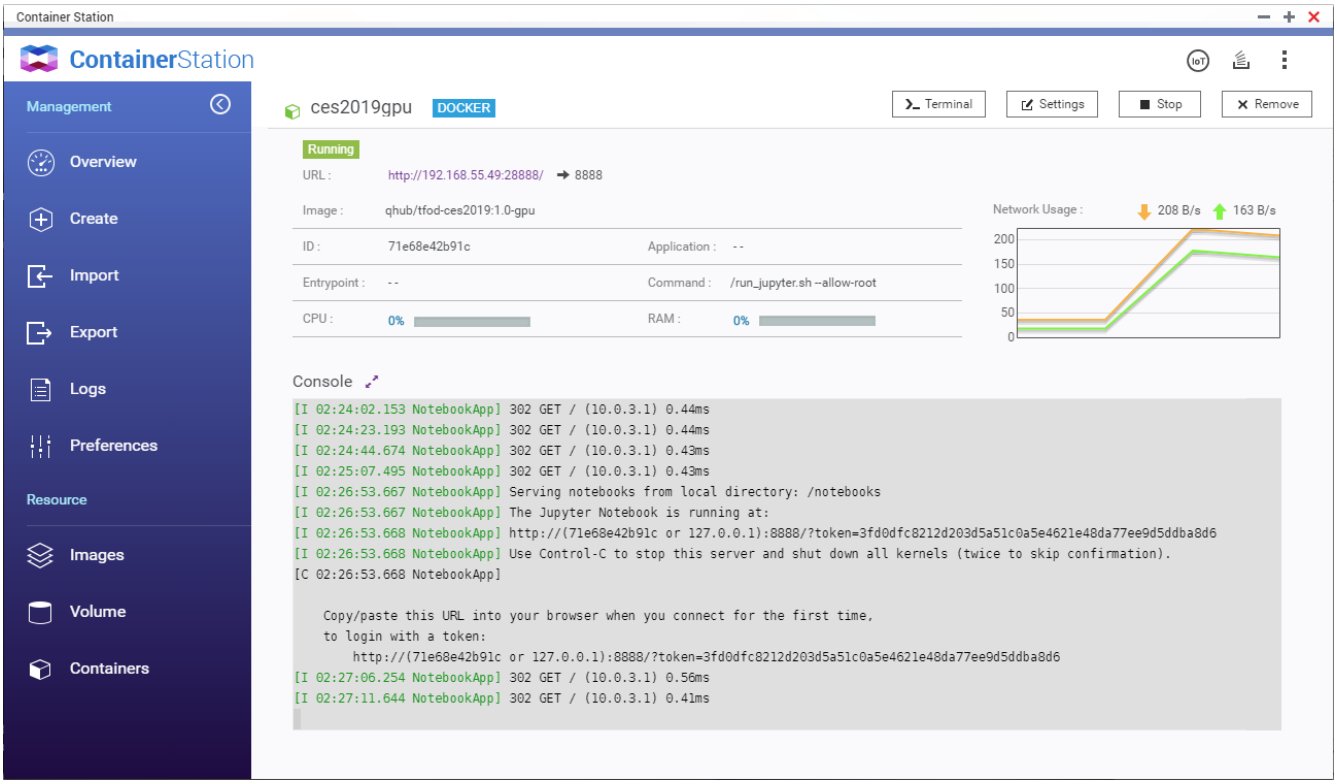
4. Mount GPU card



5. Created container



You now can surf the web link to use jupyter notebook (online IDE). **http://<IP>:28888/?token="(fetch from terminal)"**



Training

The `/object_detection/data` folder contains the training dataset (`train.tfrecords`) and the validation dataset (`val.tfrecords`) after preprocessing (classification mark and encoding into TFRecord format).

Script reference : https://github.com/qpjkw/tfod_ces2019/blob/master/object_detection/start_object_detection.sh

Executing `start_object_detection.sh` will first:

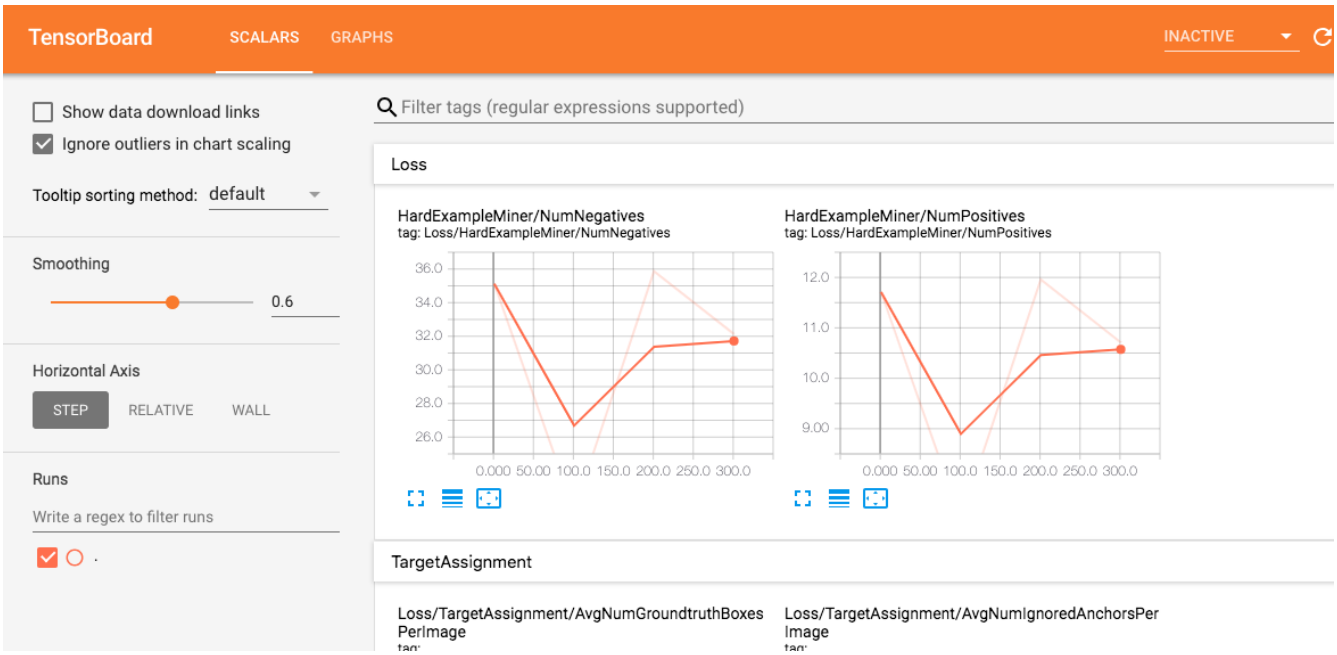
1. Generate training config (`set_training_configuration.py`) for Dataset pre-processing
2. Execute Tensorboard to view the training status (`start_tensorboard.sh`)
3. Start retraining. (`model_main.py`)
4. Generate new **model** + **labelfile**

Execute the bash script to start a training. You can open a terminal by clicking the buttons [`new > terminal`]. After you open a terminal, copy the below command and paste on it to start a retraining task.


```
bash /notebooks/object_detection/start_object_detection.sh
```

You now can surf the web link to monitor training progresses via Tensorboard.

http://<IP>:26006"



After the training, you can find the model (.pb) on `/notebooks/object_detection/model`.

If you stop the training unexpectedly, you can type the above starting training command to continue the training.

Inference

Back to jupyter notebook editor, you can edit the notebook `object_detection_demo.ipynb` to demo the object detection on images (the below image is the example).