Running Docker images using Shifter

- Running a Docker image with Shifter - Step by step
- Interactive Shell (Bash)
- Using GPUs
- Related articles

When you want to run Docker containers on the Fidis/Gacrux cluster

⚠️ Warning
We are still in beta phase. The installation will soon be improved with:

- automatic account creation on the registry

The present documentation will be updated once the registry has been modified.

Running a Docker image with Shifter - Step by step

**Prerequisite**
You need to have Docker installed on your machine

1. **Get a docker image from dockerhub for instance**

   ```
   $ docker pull alpine:latest
   $ docker images
   ```

2. **Account on the c4science registry**

   - **Request an account**
   - **Change your password on** [https://registry.c4science.ch](https://registry.c4science.ch)

3. **Set up your machine**

   - **Login on the registry from your local Docker installation**

     ```
     $ docker login registry.c4science.ch
     Username (username): username
     Password: 
     Login Succeeded
     ```

4. **Upload a Docker image to the registry**

   - **On the web interface, create a Project on the registry (private or public)**
   - **Tag the image you want to upload on your local machine and push it to the registry**

     ```
     $ docker tag alpine:latest registry.c4science.ch/yourproject/alpine:latest
     $ docker push registry.c4science.ch/yourproject/alpine:lates
     ```

5. **Pull an image on Shifter and specify a user or group ACL**

   - **From a cluster frontend (i.e.: fidis.epfl.ch), login to the registry, pull the image and check it's was pulled OK**

     ```
     $ shifterimg login
     default username: <username>
     default password:
     $ shifterimg pull yourproject/alpine:latest
     $ shifterimg images
tcm        docker     READY    9797e5e798   2018-03-15T16:00:59 yourproject/alpine:latest
     ```

   - You can specify one or multiple (separated by a comma) LDAP username and/or group so the image is only available to those people
To update the user/group ACL you can re-run the pull command
To view the full info about the images (warning: JSON):

```
$ shifterimg --group scitas-ge --user aubort,user2 pull yourproject/alpin
```

```
$ shifterimg -v images
Message: {
  "list": [
  {
    "ENTRY": null,
    "ENV": [
      "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
    ],
    "WORKDIR": "MISSING",
    "groupACL": [],
    "id": "9797e5e798a034d53525968de25bd25c913e7bb17c6d68ebc778cb33e3ff6e5",
    "itype": "docker",
    "last_pull": 1536842228.15727,
    "status": "READY",
    "status_message": ",",
    "system": "fdata2-int.fidis",
    "tag": ["scitas/alpine:latest"
    ],
    "userACL": []
  },
  [...]
}
```

6. **Run the image**

You can submit the following Slurm script with the `sbatch` command

```
#!/bin/bash -l
#SBATCH --nodes 1
#SBATCH --ntasks 1
#SBATCH --cpus-per-task 1
#SBATCH --mem 1024
srun shifter --image yourproject/alpine ls /etc
```

**Interactive Shell (Bash)**

To have an interactive shell within your image, simply use this:

```
$ srun --pty shifter --image yourproject/alpine bash
```

**Using GPUs**

On Deneb shifter runtime is installed on the GPU nodes. You need prior access to the GPUs nodes, see FAQ
[aubort@denebl ~]$ srun --gres gpu:1 --partition gpu --qos gpu shifter --image library/debian:stable-slim
nvidia-smi -L
GPU 0: Tesla K40m (UUID: GPU-21730043-7144-85e7-d251-7834adb2d1ee)
[aubort@denebl ~]$ srun --gres gpu:1 --partition gpu --qos gpu shifter --image library/nvidia-cuda:9.1-runtime
/home/aubort/gpu/cuda-samples/bin/x86_64/linux/release/simpleCUFFT
[simpleCUFFT] is starting...
GPU Device 0: "Tesla K40m" with compute capability 3.5
Temporary buffer size 448 bytes
Transforming signal cufftExecC2C
Launching ComplexPointwiseMulAndScale<<< >>>
Transforming signal back cufftExecC2C

FEEDBACK is welcome as this feature is experimental.

Related articles

- Running Docker images using Shifter
- FAQ
- Using the clusters
- How to use Tensorflow on the GPU nodes
- Running R on SCITAS machines