



Deploying NGC Containers on Your Cloud Virtual Machine

Users Guide

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Chapter 1. Preparing to Run Containers

The VMI includes a mechanism for supporting GPUs within Docker containers to obtain the best performance. Depending on the NVIDIA VMI version, the mechanisms are as follows.

- ▶ Native GPU support with Docker-CE
 - Requires Docker-CE 19.03 or later (Included in NVIDIA VMIs 19.10 and later)
- ▶ NVIDIA Container Runtime with Docker-CE
 - Included in NVIDIA VMIs prior to 19.10

Using Native GPU Support with Docker-CE

Use this method with NVIDIA VMIs version 19.10 and later.

Use `docker run --gpus` to run GPU-enabled containers.

- ▶ Example using all GPUs

```
$ docker run --gpus all ...
```

- ▶ Example using two GPUs

```
$ docker run --gpus 2 ...
```

- ▶ Examples using specific GPUs

```
$ docker run --gpus "device=1,2" ... $ docker run --gpus "device=UUID-ABCDEF,1" ...
```

Using the NVIDIA Container Runtime with Docker-CE

Use this method with NVIDIA VMIs prior to version 19.10

Use `docker run` and specify `runtime=nvidia`.

```
$ docker run --runtime=nvidia ...
```

Chapter 2. Running a Container

This section explains the basic process for running a container on the various flavors of the NVIDIA GPU-Optimized Images used to launch virtual machines on the cloud provider of your choice.

Running the Built-in TensorFlow Container

To run the TensorFlow container in the VM created from the NVIDIA GPU-Optimized Image for TensorFlow, refer to the release notes for the correct tag to use, then enter the following command.

On NVIDIA VMIs version 19.10 and later

```
docker run --gpus all --rm -it nvcr.io/nvidia/tensorflow:<tag>
```

On NVIDIA VMIs prior to version 19.10

```
docker run --runtime=nvidia --rm -it nvcr.io/nvidia/tensorflow:<tag>
```

Running the Built-in PyTorch Container

To run the PyTorch container in the VM created from the NVIDIA GPU-Optimized Image for PyTorch, refer to the release notes for the correct tag to use, then enter the following command.

On NVIDIA VMIs version 19.10 and later

```
docker run --gpus all --rm -it nvcr.io/nvidia/pytorch:<tag>
```

On NVIDIA VMIs prior to version 19.10

```
docker run --runtime=nvidia --rm -it nvcr.io/nvidia/pytorch:<tag>
```

Running a Container Downloaded from NGC

To run containers from the NGC container registry, enter the following commands.

On NVIDIA VMIs version 19.10 and later

```
docker run --gpus all --rm -it nvcr.io/nvidia/<container-image>:<tag>
```

On NVIDIA VMIs prior to version 19.10

```
docker run --runtime=nvidia --rm -it nvcr.io/nvidia/<container-image>:<tag>
```

Chapter 3. Example: MNIST Training Run Using PyTorch Container

Once logged in to the NVIDIA GPU Cloud Image instance, you can run the MNIST example under PyTorch.

Note that the PyTorch example will download the MNIST dataset from the web.

1. Pull and run the PyTorch container:

```
docker pull nvcr.io/nvidia/pytorch:18.02-py3
```

On NVIDIA VMIs version 19.10 and later

```
docker run --gpus all --rm -it nvcr.io/nvidia/pytorch:18.02-py3.10
```

On NVIDIA VMIs prior to version 19.10

```
docker run --runtime=nvidia --rm -it nvcr.io/nvidia/pytorch:18.02-py3.10
```

2. Run the MNIST example:

```
cd /opt/pytorch/examples/mnist
```

```
python main.py
```

Chapter 4. Example: MNIST Training Run Using TensorFlow Container

Once logged in to the NVIDIA GPU Cloud image, you can run the MNIST example under TensorFlow.

Note that the TensorFlow built-in example will pull the MNIST dataset from the web.

1. Pull and run the TensorFlow container.

```
docker pull nvcr.io/nvidia/tensorflow:18.08-py3
```

On NVIDIA VMIs version 19.10 and later

```
docker run --gpus all --rm -it nvcr.io/nvidia/tensorflow:18.08-py3
```

On NVIDIA VMIs prior to version 19.10

```
docker run --runtime=nvidia --rm -it nvcr.io/nvidia/tensorflow:18.08-py3
```

2. Following this tutorial: https://www.tensorflow.org/get_started/mnist/beginners, run the `MNIST_with_summaries` example.

```
cd /opt/tensorflow/tensorflow/examples/tutorials/mnist
```

```
python mnist_with_summaries.py
```

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