

NGC Note

- 1) 如何申请NGC账号并介绍上面的各种资源;
 - 2) 从本机联上NGC, 演示pull, install, start镜像, 挂载磁盘, 数据读写等基本使用操作;
 - 3) 进入容器, 介绍pycharm 的使用, 编译运行一个python小程序或进入keras 环境跑一段小代码
-

[Github: Nvidia Docker](#)

确保docker/nvidia-docker已经安装成功

验证nvidia-docker安装成功

```
nvidia-docker run hello-world
```

```
Experimental: false
church@titan-v-0:~$ nvidia-docker run hello-world

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

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/
```

NGC支持的显卡[架构](#), **Titan V**是Volta架构

- Pascal
 - Volta
 - Turing
-

使用NGC

如果是第一次使用NGC, 需要[注册账号](#)



Create an Account

Full Name

Email Address

- ☐ I agree to the [NVIDIA Account Terms of Use](#)
- ☐ By obtaining any third party software containers through NGC, I agree that NVIDIA will share my registration information with such third party software providers, who may use my information as permitted by their privacy policies.
- ☐ Send me NVIDIA GPU Cloud updates and enterprise news

Back

Sign Up

登录之后进入[SETUP](#)界面，点击Get API Key

Setup

Generate API Key



Generate your own API key to use the NGC service through the Docker client.

Get API Key

Install NGC CLI



The NGC command line interface (NGC CLI) can run deep learning jobs on NVIDIA Docker containers.

Documentation

Downloads

Setup > API Key

Generate API Key

API

API information

Generate your own API key to use the NGC service through the Docker client. Anyone with this API Key has access to all services, actions, and resources on your behalf.

Click Generate API Key to create your own API Key. If you have forgotten or lost your API Key, you can come back to this page to create a new one at any time.

Usage

Use your API key to log in to the NGC registry by entering the following command and following the prompts:

NGC CLI

```
$ ngc config set
```

Docker™ ⓘ

For the username, enter '\$oauthtoken' exactly as shown. It is a special authentication token for all users.

```
$ docker login nvcr.io

Username: $oauthtoken
Password: <Your Key>
```

Setup > API Key

Generate API Key

API

API information

Generate your own API key to use the NGC service through the Docker client. Anyone with this API Key has access to all services, actions, and resources on your behalf.

Click Generate API Key to create your own API Key. If you have forgotten or lost your API Key, you can come back to this page to create a new one at any time.

Usage

Use your API key to log in to the NGC registry by entering the following command and following the prompts:

NGC CLI

```
$ ngc config set
```

Docker™ ⓘ

For the username, enter '\$oauthtoken' exactly as shown. It is a special authentication token for all users.

```
$ docker login nvcr.io

Username: $oauthtoken
Password: a38e6K12cmBokzBLJWb0amxrdD1w60DyWmk6ZmD1MT7h2GHtMDQSNy09MD1eLTg0MMc3MD13MeExNDczYWRh
```

API Key generated successfully. This is the only time your API Key will be displayed. Keep your API Key secret. Do not share it or store it in a place where others can see or copy it.

API Key: a38e6K12cmBokzBLJWb0amxrdD1w60DyWmk6ZmD1MT7h2GHtMDQSNy09MD1eLTg0MMc3MD13MeExNDczYWRh

生成 API Key 成功后，回到 GPU 云服务器命令行，运行如下命令进行登录：

```
docker login nvcr.io
Username: $oauthtoken
Password: <Your Key>
```

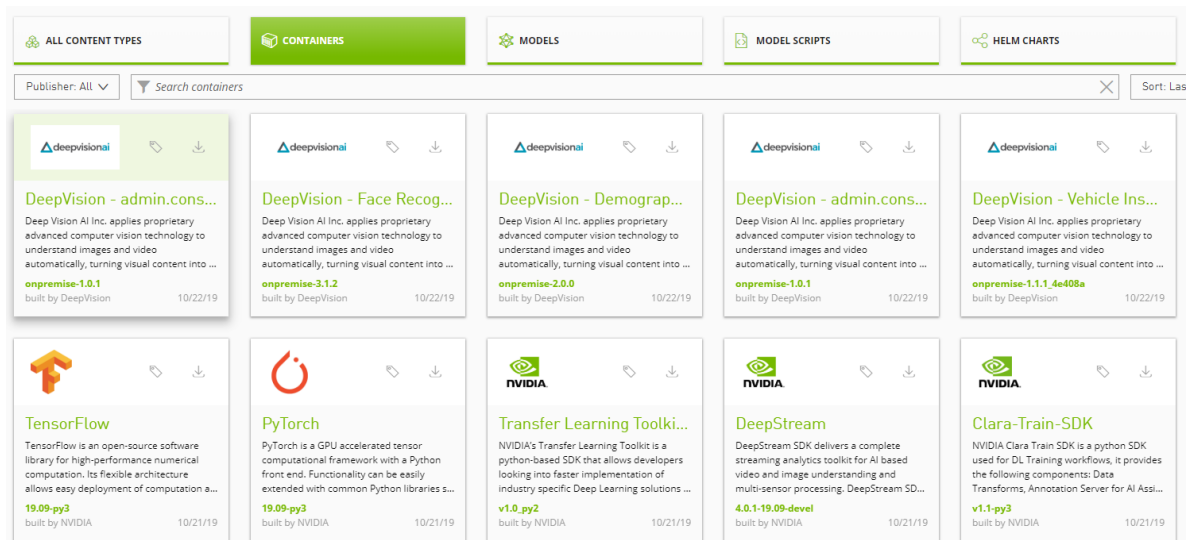
其中用户名固定为 **\$oauthtoken**，密码即前面生成的 **API Key**。

登录成功

```
church@titan-v-0:~$ docker login nvcr.io
Username: $oauthtoken
Password:
WARNING! Your password will be stored unencrypted in /home/church/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store


Login Succeeded
church@titan-v-0:~$
```

下面获取官方 Docker Image, 回到[容器镜像](#)页面：NGC 提供的深度学习环境镜像



选择需要拉取的镜像，进入对应的页面，以[PyTorch](#)为例

< PyTorch



Publisher
Facebook

Built By
NVIDIA

Latest Tag
19.09-py3

Modified
October 19, 2019

Size
3.28 GB

Description

PyTorch is a GPU accelerated tensor computational framework with a Python front end. Functionality can be easily extended with common Python libraries such as NumPy, SciPy, and Cython. Automatic differentiation is done with a tape-based system at both a functional and neural network layer level.

Labels

Deep Learning Training


Pull Command

```
docker pull nvcr.io/nvidia/pytorch:19.09-py3
```

运行如下命令 pull 该 image（整个image pull下来需要很长的时间）：

```
docker pull nvcr.io/nvidia/pytorch:19.09-py3
```

点击[这里](#)可以看到对应镜像版本中包含的全部软件



ACCELERATED COMPUTING

Getting Started

PyTorch Release Notes

- 1. PyTorch Overview
- 2. Pulling A Container
- 3. Running PyTorch
- 4. PyTorch Release 19.09 =>
- 5. PyTorch Release 19.08
- 6. PyTorch Release 19.07
- 7. PyTorch Release 19.06
- 8. PyTorch Release 19.05
- 9. PyTorch Release 19.04
- 10. PyTorch Release 19.03
- 11. PyTorch Release 19.02
- 12. PyTorch Release 19.01
- 13. PyTorch Release 18.12
- 14. PyTorch Release 18.12
- 15. PyTorch Release 18.11
- 16. PyTorch Release 18.10
- 17. PyTorch Release 18.09
- 18. PyTorch Release 18.08
- 19. PyTorch Release 18.07
- 20. PyTorch Release 18.06
- 21. PyTorch Release 18.05
- 22. PyTorch Release 18.04
- 23. PyTorch Release 18.03
- 24. PyTorch Release 18.02
- 25. PyTorch Release 18.01
- 26. PyTorch Release 17.12
- 27. PyTorch Release 17.11
- 28. PyTorch Release 17.10
- 29. PyTorch Release 17.09
- 30. PyTorch Release 17.07
- 31. PyTorch Release 17.06

DEEP LEARNING FRAMEWORKS DOCUMENTATION

PyTorch Release 19.09

The NVIDIA container image for PyTorch, release 19.09, is available on [NGC](#).

Contents of the PyTorch container

This container image contains the complete source of the version of PyTorch in `/opt/pytorch`. It is

The container also includes the following:

- [Ubuntu 18.04](#) including [Python 3.6](#) environment
- [NVIDIA CUDA 10.1.243](#) including [cuBLAS 10.2.1.243](#)
- [NVIDIA cuDNN 7.6.3](#)
- [NVIDIA NCCL 2.4.8](#) (optimized for [NVLink™](#))
- [APEX](#)
- [MLNX_OFED](#)
- [OpenMPI 3.1.4](#)
- [TensorBoard 1.14.0+nv](#)
- [Nsight Compute 2019.4.0](#)
- [Nsight Systems 2019.4.2](#)
- [TensorRT 6.0.1](#)
- [DALI 0.12.0 Beta](#)
- Tensor Core optimized examples:
 - [Jasper](#)
 - [BERT](#)
 - [Mask R-CNN](#)
 - [Tacotron 2 and WaveGlow v1.1](#)
 - [SSD300 v1.1](#)
 - [Neural Collaborative Filtering \(NCF\)](#)
 - [Transformer](#)
 - [ResNet50 v1.5](#)
 - [GNMT v2](#)
- Jupyter and JupyterLab:
 - [Jupyter Client 5.3.1](#)
 - [Jupyter Core 4.5.0](#)
 - [Jupyter Notebook 6.0.1](#)
 - [JupyterLab 1.0.4](#)
 - [JupyterLab Server 1.0.6](#)
 - [Jupyter-TensorBoard](#)

拉取镜像完成之后，运行如下命令查看docker中的镜像文件

```
docker images
```

```
church@titan-v-0:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
nvr.io/nvidia/pytorch 19.09-py3          9d6f9ccfbc31       7 weeks ago        9.15GB
nvr.io/nvidia/pytorch 18.04-py2          a5638af6da71       7 months ago        3.61GB
hello-world         latest             fce289e99eb9       9 months ago        1.84kB
traviszeng/k8s-mxnet-gpu-dgut latest             84134a6a2dfb       10 months ago        6.67GB
cifar10-resnet.tar   latest             1358bfe60ac4       11 months ago        3GB
cifar10-resnet       18.01-py3          79c40569c7f1       11 months ago        4.62GB
pg-gan               18.06-py3          486d4b1496c7       11 months ago        3.56GB
traviszeng/k8s-mxnet-cpu-802 latest             91e5f2759997       11 months ago        2.51GB
hbo_adv_detection    18.03-py3          68d0999f51f2       12 months ago        4.62GB
traviszeng/k8s-mxnet-gpu-802 latest             07f9763dfe7b       12 months ago        6.67GB
nvr.io/nvidia/k8s/device-plugin 1.9               928c1edfc4dc       16 months ago        63MB
nvr.io/nvidia/k8s/kube-proxy-amd64 v1.9.7            137ff468af56       16 months ago        109MB
nvr.io/nvidia/k8s/kube-scheduler-amd64 v1.9.7            9df5eb2a4f60       16 months ago        63MB
nvr.io/nvidia/k8s/kube-controller-manager-amd64 v1.9.7            db65d8376355       16 months ago        139MB
nvr.io/nvidia/k8s/kube-apiserver-amd64 v1.9.7            878426b7fd29       16 months ago        213MB
quay.io/coreos/flannel v0.10.0-amd64     f0fad859c909       21 months ago        44.6MB
nvr.io/nvidia/k8s/etcd-amd64 3.1.11            59d36f27cceb       23 months ago        194MB
nvr.io/nvidia/k8s/k8s-dns-sidecar-amd64 1.14.7            db76ee297b85       2 years ago          42MB
nvr.io/nvidia/k8s/k8s-dns-kube-dns-amd64 1.14.7            5d049a8c4eec       2 years ago          50.3MB
nvr.io/nvidia/k8s/k8s-dns-dnsmasq-nanny-amd64 1.14.7            5feec37454f4       2 years ago          41MB
gcr.io/google_containers/pause-amd64 3.0               99e59f495ffa       3 years ago          747kB
church@titan-v-0:~$
```

启动 NGC 容器

运行一下命令启动NGC容器

```
nvidia-docker run -ti -v /mnt:/mnt 9d6 /bin/bash
```

其中 9d6 为上一步 pull 下来 image 的 ID 前 3 个字母，缩写是为了输入方便

也可以使用镜像名：版本号（nvcr.io/nvidia/pytorch:19.09-py3）。

-v /mnt: /mnt 表示将本地 /mnt 目录映射到 Docker 容器 /mnt 位置，方便 Docker 与主机之间互拷文件。

启动界面如下

```
church@titan-v-0:~$ nvidia-docker run -ti -v /mnt:/mnt 9d6 /bin/bash

=====
== PyTorch ==
=====

NVIDIA Release 19.09 (build 7911588)
PyTorch Version 1.2.0a0+afb7a16

Container image Copyright (c) 2019, NVIDIA CORPORATION. All rights reserved.

Copyright (c) 2014-2019 Facebook Inc.
Copyright (c) 2011-2014 Idiap Research Institute (Ronan Collobert)
Copyright (c) 2012-2014 Deepmind Technologies (Koray Kavukcuoglu)
Copyright (c) 2011-2012 NEC Laboratories America (Koray Kavukcuoglu)
Copyright (c) 2011-2013 NYU (Clement Farabet)
Copyright (c) 2006-2010 NEC Laboratories America (Ronan Collobert, Leon Bottou, Iain Melvin, Jason Weston)
Copyright (c) 2006 Idiap Research Institute (Samy Bengio)
Copyright (c) 2001-2004 Idiap Research Institute (Ronan Collobert, Samy Bengio, Johnny Mariethoz)
Copyright (c) 2015 Google Inc.
Copyright (c) 2015 Yangqing Jia
Copyright (c) 2013-2016 The Caffe contributors
All rights reserved.

Various files include modifications (c) NVIDIA CORPORATION. All rights reserved.
NVIDIA modifications are covered by the license terms that apply to the underlying project or file.

NOTE: MOFED driver for multi-node communication was not detected.
Multi-node communication performance may be reduced.

NOTE: The SHMEM allocation limit is set to the default of 64MB. This may be
insufficient for PyTorch. NVIDIA recommends the use of the following flags:
nvidia-docker run --ipc=host ...

root@eabdc2c51e7:/workspace#
```

检查容器中 GPU 驱动是否正常：

```
nvidia-smi
```

```
root@eabdc2c51e7:/workspace# nvidia-smi
Sun Oct 27 05:10:15 2019

+-----+
| NVIDIA-SMI 430.26          Driver Version: 430.26          CUDA Version: 10.2          |
+-----+-----+
| GPU   Name                Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan   Temp   Perf          Pwr:Usage/Cap|               Memory-Usage | GPU-Util  Compute M. |
+-----+-----+
|  0    TITAN V              Off         | 00000000:02:00.0 On  |                N/A   |
| 36%    51C    P2           39W / 250W | 922MiB / 12058MiB |      2%    Default   |
+-----+-----+

+-----+
| Processes:                                     GPU Memory |
|  GPU       PID    Type    Process name                     Usage      |
+-----+-----+
root@eabdc2c51e7:/workspace#
```