# Lab1: ONNC Working Environment Setup

Cheng-Chi Wang
Skymizer Taiwan Inc



# Prerequisite

- Install
  - Docker
  - Git
- Clone GitHub repositories

```
$ git clone https://github.com/ONNC/onnc.git
$ cd onnc
$ git checkout tags/1.3.0
$ cd ..
$ git clone https://github.com/ONNC/onnc-tutorial.git
```

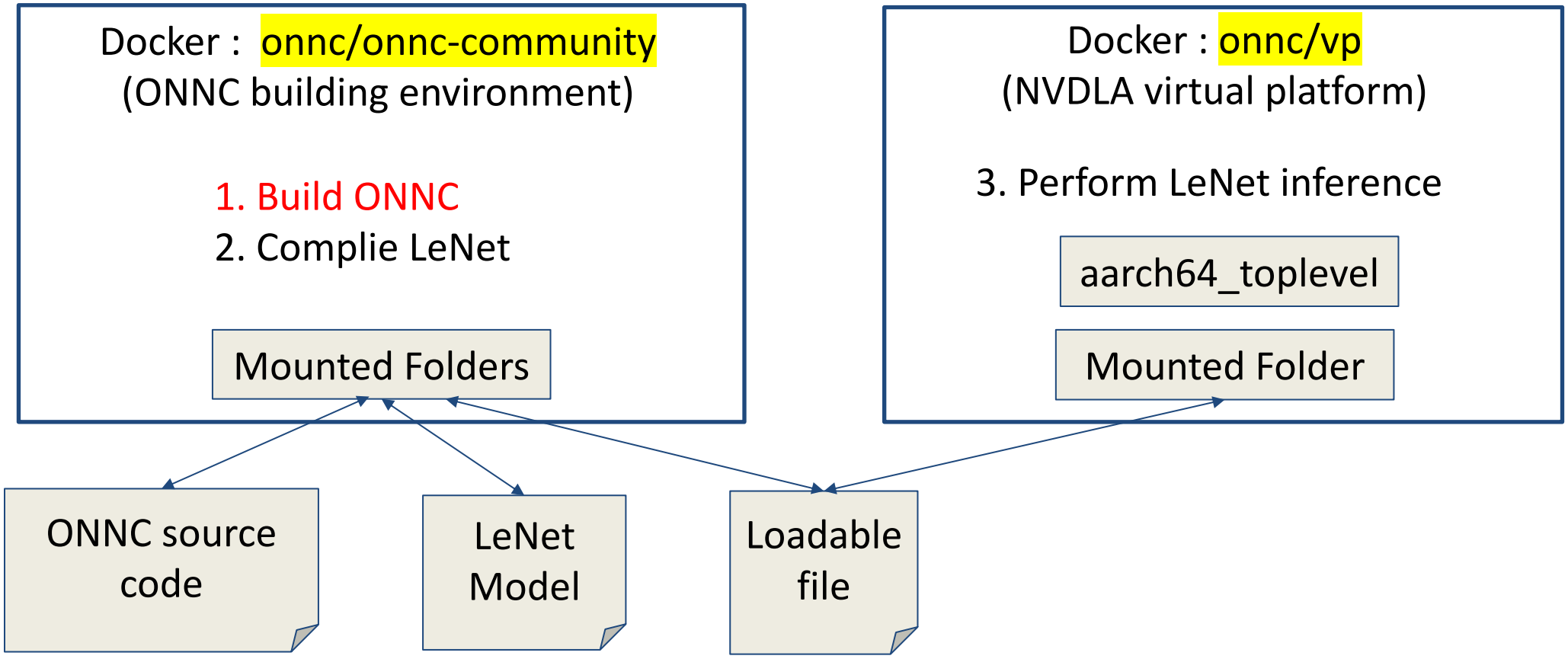
- Download DockerHub Images

```
$ docker pull onnc/onnc-community
$ docker pull onnc/vp
```




skymizer

# ONNC Working Environment – Build ONNC



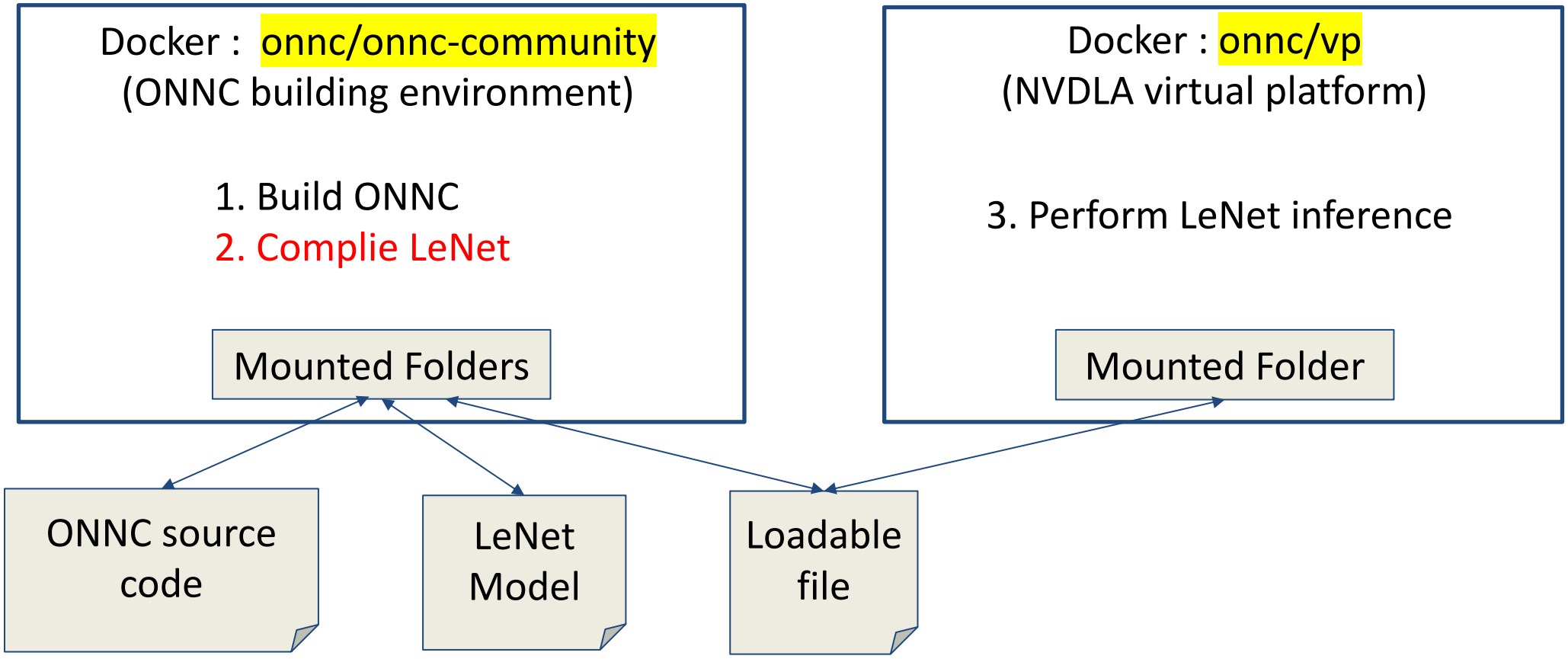
# 1. Build ONNC

```
# Bring up the onnc/onnc-community Docker container.
$ docker run -ti --rm -v <path/to/onnc>:/onnc/onnc -v <path/to/tutorial>:/tutorial onnc/onnc-community

# Build ONNC
$ smake -j8 install
```




skymizer

# ONNC Working Environment – Compile LeNet







skymizer

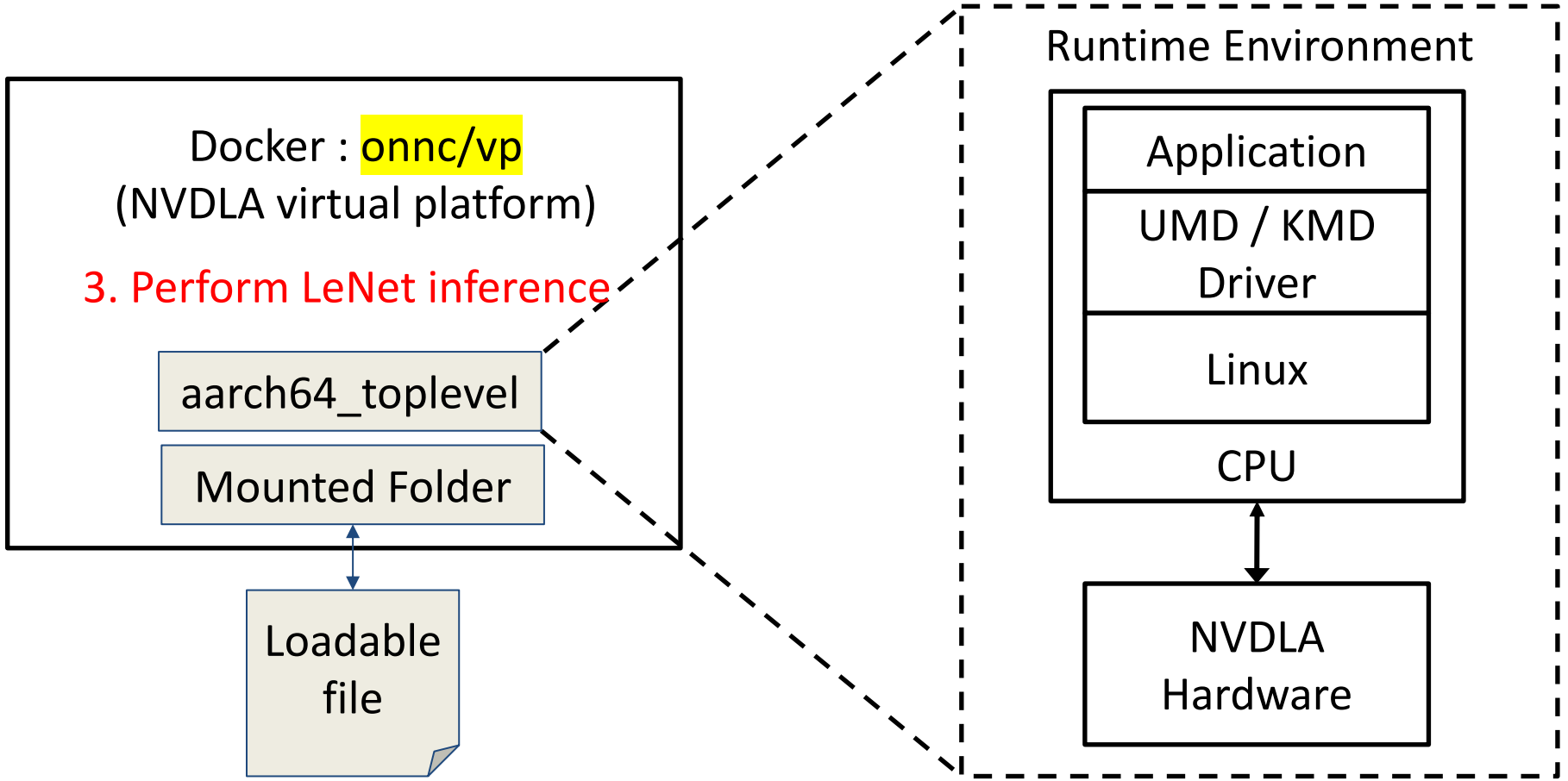
# 2. Compile LeNet

```
# Run ONNC to compile a DNN model.
$ onnc -mquadruple nvdla /tutorial/models/lenet/lenet.onnx

# Prepare the compiled output file for the virtual platform to run.
$ sudo mv out.nvdla /tutorial/models/lenet/

# Exit the Docker prompt
$ exit
```




skymizer

# ONNC Working Environment – Perform LeNet inference



# 3. Perform LaNet inference

```
# Bring up the onnc/vp Docker container.
$ docker run -ti --rm -v <absolute/path/to/tutorial>:/tutorial onnc/vp

# Prepare loadable, input picture for the future use.
$ cd /usr/local/nvdla
$ cp /tutorial/models/lenet/* .

# Run the virtual platform.
$ aarch64_toplevel -c aarch64_nvdla.lua

        SystemC 2.3.0-ASI --- Oct  9 2017 04:21:14
      Copyright (c) 1996-2012 by all Contributors,
      ALL RIGHTS RESERVED
...
Starting sshd: [    4.590433] NET: Registered protocol family 10
[    4.606182] Segment Routing with IPv6
OK
   Welcome to Buildroot
nvdla login
```




skymizer

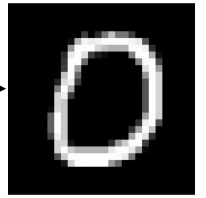
# 3. Perform LaNet inference

```
Welcome to Buildroot
nvdla login: root
Password: nvdla
#
# mount -t 9p -o trans=virtio r /mnt && cd /mnt
# insmod drm.ko && insmod opendla.ko
#
[ 469.730339] opendla: loading out-of-tree module taints kernel.
[ 469.734509] reset engine done
[ 469.737998] [drm] Initialized nvdla 0.0.0 20171017 for 10200000.nvdla on
minor 0
```




skymizer

# 3. Perform LaNet inference

input0.pgm → 

```
# Within the virtual platform run the NVDLA runtime (containing UMD) to do model inference.
$ ./nvdla_runtime --loadable out.nvdla --image input0.pgm --rawdump

creating new runtime context...
Emulator starting # …
[ 126.029817] Enter:dla_handle_events, processor:CDP
[ 126.029995] Exit:dla_handle_events, ret:0
[ 126.030146] Enter:dla_handle_events, processor:RUBIK
[ 126.030323] Exit:dla_handle_events, ret:0
[ 126.032432] reset engine done Shutdown signal received, exiting
Test pass
```



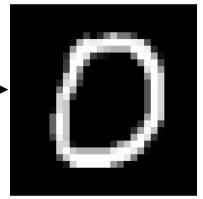

skymizer

# Confidence level of the 10 digits from 0 to 9

```
$ more output.dimg
149.25 -49.625 13.875 11.2344 -59.8125 -2.61523 7.80078 -44.7188 30.8594
17.3594
```

| 10 digits (0~9) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Confidence level | 149.25 | -49.625 | 13.875 | 11.2344 | -59.8125 | -2.61523 | 7.80078 | -44.7188 | 30.8594 | 17.3594 |

input0.pgm →






skymizer

skymizer

Boost deep learning accelerator
with compiler technology

# Skymizer Taiwan Inc.


CONTACT US

**E-mail** sales@skymizer.com **Tel** +886 2 8797 8337

**HQ** 12F-2, No.408, Ruiguang Rd., Neihu Dist., Taipei City 11492, Taiwan

**BR** Center of Innovative Incubator, National Tsing Hua University, Hsinchu Taiwan


https://skymizer.com