

Deep Learning on OpenPower using PowerAI Hands-on Lab

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Introduction:

The IBM PowerAI facilitates a jump start with open source machine learning and deep learning frameworks such as Caffe, Tensorflow, Theano, Torch, and Chainer on OpenPOWER machines with GPUs. In addition, PowerAI provides advanced deep learning capabilities such as distributed deep learning and large model support.

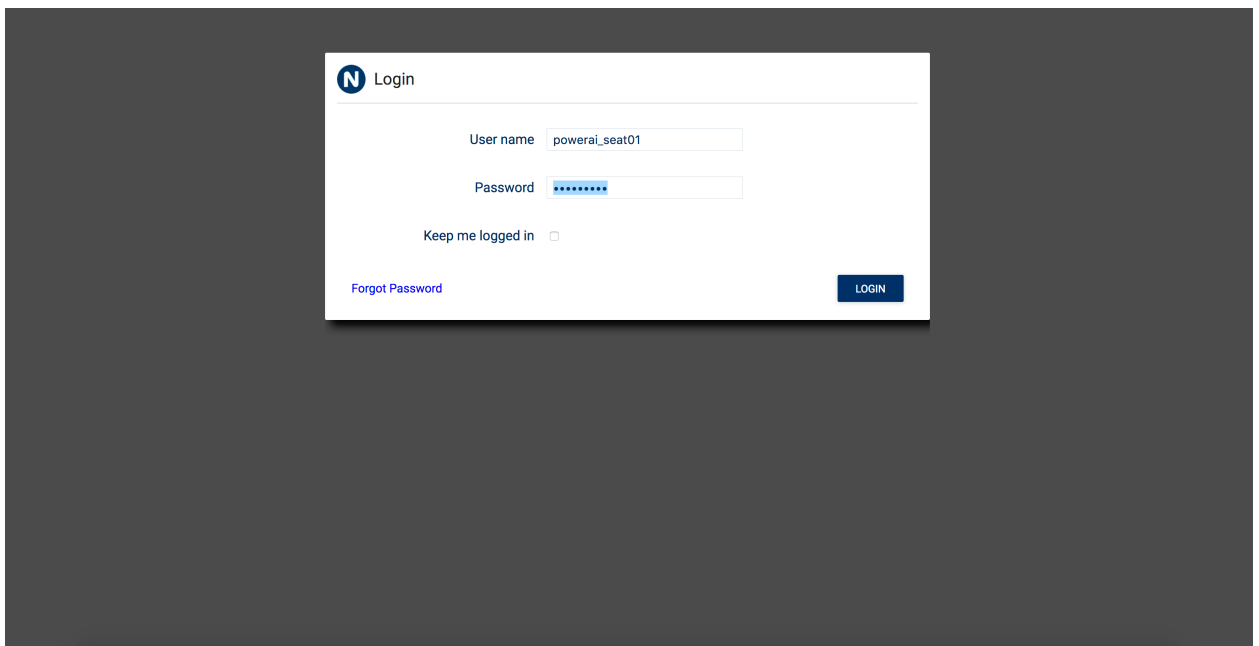
Instructions

We will conduct this lab session on the NIMBIX cloud which provides Docker containers with P100 GPUs attached on **Power8 boxes**. The MRI cluster will be utilizing the IBM Accelerated Computing 922 machines equipped with Power9 processors and Volta GPUs.

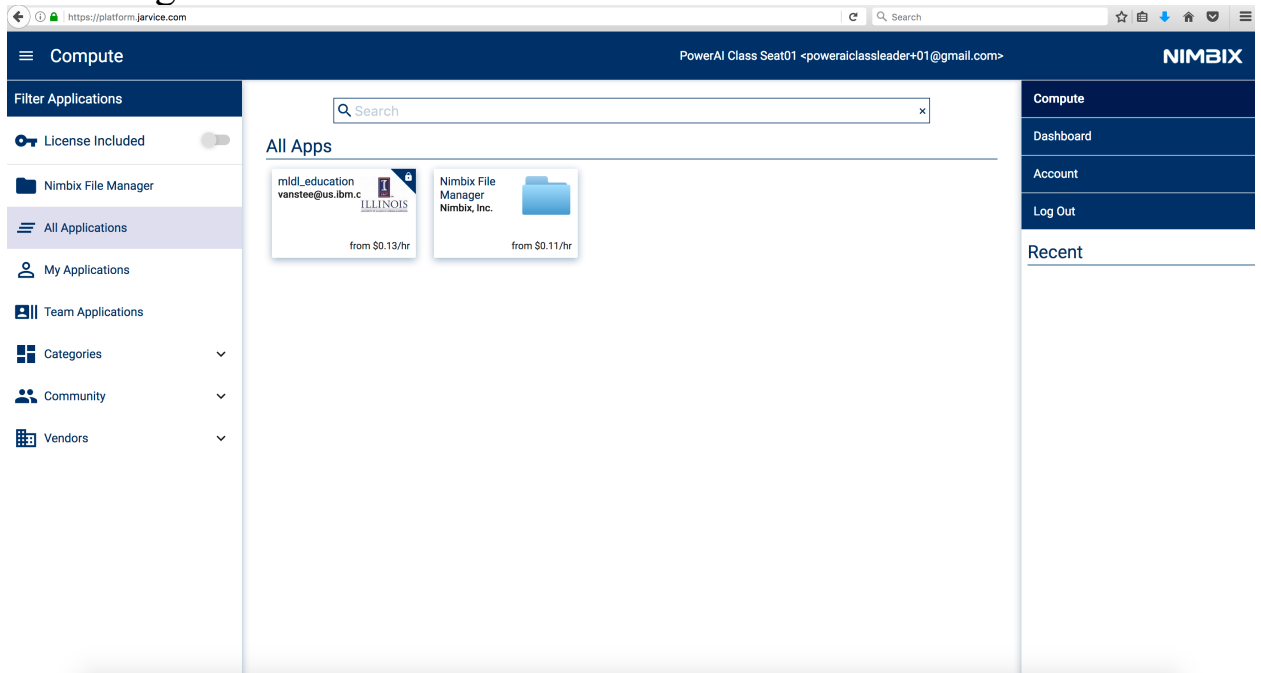
1) Logon to <https://platform.jarvice.com/>.

For User name powerai_seat01, the password is pw_seat01.

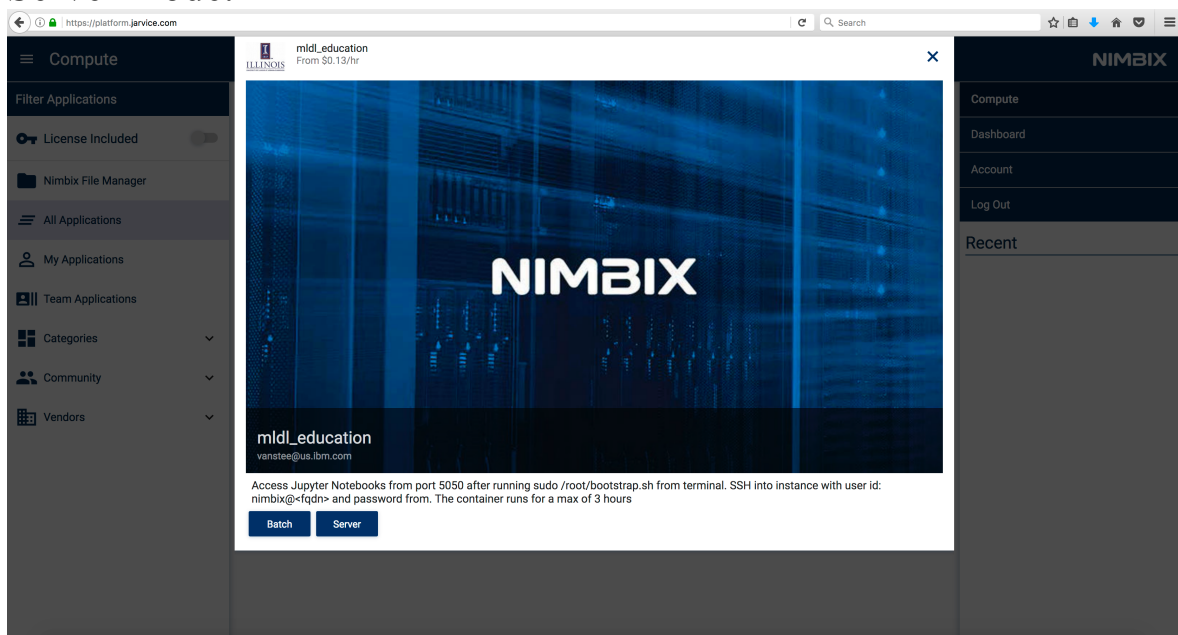
For User name powerai_seatNN, the password is pw_seatNN.



2) Go to the Compute tab and find the mldl_education app with the UIUC logo.



3) Click on the app to launch a container for the PowerAI app in the Server mode.



4) Click on Server. Select 32/64 thread Power8, 128GB RAM, and 1X P100 GPU. Then Submit. Expect some queuing in launching the container. 5-10 minutes of delay is not unusual.

The screenshot displays the Nimbix platform's 'Server' configuration interface. The main content area is titled 'Server' and includes a sub-header 'Machine'. A dropdown menu for 'Machine type' is set to '32 thread POWER8, 128GB RAM, 1x P100 GPU w/NVLink (np8g1)'. Below this, a 'Cores' slider is set to 32, and the price is listed as \$1.49/hr. A green 'SUBMIT' button is visible at the bottom right of the configuration area. The interface also shows a sidebar with navigation options like 'Compute', 'Filter Applications', and 'License Included', and a top navigation bar with 'NIMBIX' branding.

5) Get the Host Name and password of your launched container from the NIMBIX UI

The screenshot displays the NIMBIX web interface. At the top, the header includes a hamburger menu, the text 'Dashboard', the user email 'PowerAI Class Seat01 <powerai.classleader+01@gmail.com>', and the NIMBIX logo. The left sidebar contains navigation options: 'Jobs' (with sub-items 'Current', 'History', 'Reports'), 'Stats', and 'Compute'. The 'Stats' section shows 'JOBS RUN' as 4 and 'COMPUTE' as 66:03:02. The main content area is titled 'Current' and shows details for a job named 'mld_education(366441)'. The job status is 'Processing' and it is running on 'x 1 node'. The command is 'Server', the address is 'NAE-165-254-189-41.jarvice.com', and the password is 'sCXI4FOCVcbMo4y'. A terminal window below the details shows the NIMBIX logo. The right sidebar contains 'Compute', 'Dashboard', 'Account', 'Log Out', and a 'Recent' section with a card for 'mld_education vanstee@us.ibm.c' from \$0.13/hr. A 'Document2' tab is visible at the bottom right.

6) Launch a terminal in your workstation and ssh to your container:
ssh nimbix@<host name>.jarvice.com

```
chekuri.choudaryibm.com — nimbix@JARVICENAE-0A0A185C: ~ — ssh nimbix@NAE-165-254-189-41.jarvice.com — 137x48

Chekuris-MacBook-Pro:~ chekuri.choudaryibm.com$ ssh nimbix@NAE-165-254-189-41.jarvice.com
nimbix@nae-165-254-189-41.jarvice.com's password:
Welcome to Ubuntu 16.04.3 LTS (GNU/Linux 4.4.0-45-generic ppc64le)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage
All ML/DL frameworks live in /opt/DL; you must source an environment setup
script before accessing them, e.g. one of the following:

source /opt/DL/caffe-bvlc/bin/caffe-activate
source /opt/DL/caffe-ibm/bin/caffe-activate
source /opt/DL/caffe-nv/bin/caffe-activate # recommended
source /opt/DL/chainer/bin/chainer-activate
source /opt/DL/openblas/bin/openblas-activate
source /opt/DL/tensorflow/bin/tensorflow-activate
source /opt/DL/theano/bin/theano-activate
source /opt/DL/torch/bin/torch-activate

After sourcing the environment script for the framework you wish to use,
please read the framework-specific documentation in its respective doc[s]
directory - e.g. one of the following:

/opt/DL/caffe-*/docs
/opt/DL/chainer/doc
/opt/DL/openblas/doc
/opt/DL/repo/doc
/opt/DL/tensorflow/doc
/opt/DL/theano/doc
/opt/DL/torch/doc

Please be sure to save any persistent code or data in the /data directory!

##### Class Instructions #####

To run jupyter notebooks, run the following commands :

source /root/python2_env/bin/activate
cd /dl-labs/mldl-101
./startClass2.sh -g 1

Then point your browser to hostname:5050 and get started
Last login: Thu Feb 22 17:55:11 2018 from 70.123.154.135
nimbix@JARVICENAE-0A0A185C:~$
```

7) Run the following commands to download exercises and launch jupyter notebooks.

```
source /root/python2_env/bin/activate
cd /dl-labs/mldl-101
./startClass2.sh -g 1
git clone https://github.com/aymericdamien/TensorFlow-Examples/
```

8) Then point your browser to hostname:5050 and get started. Go to the folder Tensorflow-Examples/notebooks. These notebooks will be used for hands-on exercises.



Files Running Clusters

Select items to perform actions on them.

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	Name	Last Modified
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<input type="checkbox"/>	lab3-mnist-tensorflow	2 days ago
<input type="checkbox"/>	lab4-yolo-keras	2 days ago
<input type="checkbox"/>	labxx-caffe-examples	2 days ago
<input type="checkbox"/>	labxx-sparksqj	2 days ago
<input type="checkbox"/>	labxx-transferlearning	2 days ago
<input type="checkbox"/>	TensorFlow-Examples	a minute ago
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<input type="checkbox"/>	README.md	2 days ago
<input type="checkbox"/>	startClass2.sh	2 days ago

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