Installing MXNet

Indicate your preferred configuration. Then, follow the customized commands to install *MXNet*.

Linux | MacOS | Windows | Cloud | Devices

Python | Scala | R | Julia | Perl

CPU | GPU

Pip | Virtualenv | Docker | Build from Source

The following installation instructions have been tested on Ubuntu 14.04 and 16.04.

Building *MXNet* from source is a 2 step process.

1. Build the *MXNet* core shared library, `libmxnet.so`, from the C++ sources.
2. Build the language specific bindings. Example - Python bindings, Scala bindings.

Minimum Requirements

1. GCC 4.8 or later to compile C++ 11.
2. GNU Make

Build the MXNet core shared library

Step 1 Install build tools and git.

```
$ sudo apt-get update
$ sudo apt-get install -y build-essential git
```

Step 2 Install OpenBLAS.

MXNet uses BLAS and LAPACK libraries for accelerated numerical computations on CPU machine. There are several flavors of BLAS/LAPACK libraries - OpenBLAS, ATLAS and MKL. In this step we install OpenBLAS. You can choose to install ATLAS or MKL.

```
$ sudo apt-get install -y libopenblas-dev liblapack-dev
```

Step 3 Install OpenCV.

MXNet uses OpenCV for efficient image loading and augmentation operations.

```
$ sudo apt-get install -y libopencv-dev
```

Step 4 Download MXNet sources and build MXNet core shared library.

```
$ git clone --recursive https://github.com/dmlc/mxnet
$ cd mxnet
$ make -j $(nproc) USE_OPENCV=1 USE_BLAS=openblas
```

Note - USE_OPENCV and USE_BLAS are make file flags to set compilation options to use OpenCV and BLAS library. You can explore and use more compilation options in `make/config.mk`.

Build the MXNet Python binding

Step 1 Install prerequisites - python, setup-tools, python-pip and numpy.

```
$ sudo apt-get install -y python-dev python-setuptools python-numpy python-pip
```

Step 2 Install the MXNet Python binding.

```
$ cd python
$ pip install --upgrade pip
$ pip install -e .
```

Note that the `-e` flag is optional. It is equivalent to `--editable` and means that if you edit the source files, these changes will be reflected in the package installed.

Step 3 Install Graphviz. (Optional, needed for graph visualization using `mxnet.viz` package).

```
sudo apt-get install graphviz
pip install graphviz
```

Step 4 Validate the installation by running simple MXNet code described here.

Validate MXNet Installation

Start the python terminal.

```
$ python
```

Run a short *MXNet* python program to create a 2X3 matrix of ones, multiply each element in the matrix by 2 followed by adding 1. We expect the output to be a 2X3 matrix with all elements being 3.

```
>>> import mxnet as mx
>>> a = mx.nd.ones((2, 3))
>>> b = a * 2 + 1
>>> b.asnumpy()
array([[ 3.,  3.,  3.],
       [ 3.,  3.,  3.]], dtype=float32)
```

Exit the Python terminal.

```
>>> exit()
$
```