

# Guide to Building VTA

Following is a guide to building and installing VTA. It mostly follows the guide at [https://docs.tvm.ai/install/from\\_source.html](https://docs.tvm.ai/install/from_source.html), but includes extra helpful details and omits some confusing parts. This guide was created by installing VTA on Linux Mint 19 Tara, but the instructions should be similar to any Debian-based Linux distribution.

## I. Installing and Building TVM

### 1. Clone the Repository

Download the source code from GitHub by executing the following command. Note the --recursive flag is used to also download the submodules. This guide assumes that TVM is placed in the user's home directory /home/user.

```
git clone --recursive https://github.com/dmlc/tvm.git
```

### 2. Install Python

Install Python and some associated software by executing the following commands:

```
sudo apt-get update
sudo apt-get install -y python python-dev python-setuptools gcc libtinfo-dev zlib1g-dev
```

### 3. Install Dependencies

Building TVM requires having g++ (version 4.8 or higher) and Cmake (version 3.5 or higher) installed. To check the versions you have installed, execute the following code:

```
g++ --version
cmake --version
```

If one or both are not installed or do not meet the minimum version requirements, they can be installed by executing:

```
sudo apt install g++
sudo apt install cmake
```

### 4. Download LLVM

TVM recommends building with LLVM. To install LLVM, download one of the prebuilt binaries from <http://releases.llvm.org/download.html>. I used the Ubuntu 16.04 prebuilt binary. Also, note that at the time of this writing, LLVM version 7.0.0 **IS NOT SUPPORTED** by TVM. Download LLVM version 6.0.1 or less. Move the downloaded file to your home directory, then execute the following to decompress the file:

```
tar -xJf <downloaded_file>
```

### 5. Configure Build

Next, we will edit the configuration file used for building TVM. First, change directories to the TVM directory and then create a new directory for building:

```
cd tvm/
mkdir build/
```

Now, copy the default build configuration file to the directory you just created.

```
cp cmake/config.cmake build/
```

If you chose to download LLVM in Step 4, we now need to modify the configuration file to tell TVM where LLVM is. Change the line in `config.cmake` that says

```
set(USE_LLVM OFF)
```

to instead say

```
set(USE_LLVM <llvm_folder>/bin/llvm-config)
```

Make sure to use the absolute path to the LLVM folder.

## 6. Build TVM

Now, we're ready to actually build TVM. Execute the following:

```
cd build
cmake ..
make -j4
```

Make sure that both instructions execute to completion and do not report any errors. After executing these instructions, check the build directory and confirm that `libtvm.so` and `libtvm_topi.so` have been created. If they haven't, one of the above steps has been done incorrectly.

## 7. Add Python Paths

Now we need to set the `PYTHONPATH` environment variable to tell Python where the TVM Python package is. Add the following lines to `.bashrc` in your home directory:

```
export TVM_HOME=/path/to/tvm
export PYTHONPATH=$TVM_HOME/python:$TVM_HOME/topi/python:$TVM_HOME/nnvm/python:${PYTHONPATH}
```

Finally, execute the following line to make these changes to `.bashrc` take effect:

```
source .bashrc
```

## 8. Install Python Dependencies

Install the Python packages TVM depends on by executing:

```
pip install --user numpy decorator
```

## 9. Test TVM

At this point TVM should be fully installed. Confirm this by navigating to the TVM tests and running one of them:

```
cd tvm/tests/python/integration
python3 test_dot.py
```

If nothing is printed, then TVM is fully built and working.

## II. Building VTA

VTA is built with TVM by default, so if you've followed the guide to this point, VTA should already be built. We just need to add a line to the `.bashrc` file in your home directory.

### 1. Adding Python Paths

Add the following line to your `.bashrc` file:

```
export PYTHONPATH=/path/to/vta/python:${PYTHONPATH}
```

Execute the following to make these changes take effect:

```
source .bashrc
```

### 2. Test VTA

Finally, run the `vta_get_started.py` file to confirm that VTA has been successfully installed:

```
cd tvn/vta/tutorials
python3 vta_get_started.py
```

If "Successful vector add test!" is printed to the screen, then congratulations! You've just successfully installed VTA.