**Mbed CLI and GCC-ARM Compiler Installation**

This document is based on the instructions provided by ARM here: [https://os.mbed.com/docs/mbed-os/v5.9/tutorials/quick-start-offline.html#linux](https://os.mbed.com/docs/mbed-os/v5.9/tutorials/quick-start-offline.html" \l "linux).

**PLEASE FOLLOW THE INSTRUCTIONS OUTLINED IN THIS DOCUMENT AND NOT WHAT IS LISTED ON THE MBED WEBSITE.**

There are some key differences between what is outlined in this document and what is on the MBED website that were found to not work correctly.

**1. System requirements:**

**Ubuntu 18.04** (it may also work in previous versions). It will work in later versions. You can download Ubuntu from the following link: <https://www.ubuntu.com/download/desktop>

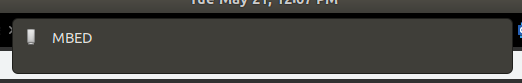
**2. Dependencies:**

**Python 2.7 and Pip**

* To install Python and Pip:
  + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following command and press ENTER:   
    *sudo apt-get install python2.7 python-pip*
  + Type the administrative password and press ENTER
  + When you are asked "Do you want to continue?" type: *y* and then press ENTER
  + Wait until the installation is finished

**ARM Cortex-M Device with the Mbed Bootloader Installed**

* Check if device has the Mbed bootloader installed:
  + Plug device into a free USB port on your PC, ensuring that it is plugged into the ‘OpenSDA’ port on the device.



* + If the device is labeled ‘MBED’, no action is needed. If not, the Mbed bootloader will have to be installed on the device. See Appendix for details.

**3. GCC-ARM Compiler**

The latest GCC-ARM Compiler can be downloaded from the following link:

<https://developer.arm.com/tools-and-software/open-source-software/developer-tools/gnu-toolchain/gnu-rm/downloads>

* Once downloaded:
  + Open File Explorer and navigate to ‘Downloads’ folder.
  + Right click on downloaded file and select “Extract Here” option. Wait for extraction to complete, it may take a minute.
  + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following command and press ENTER:

*sudo mv /home/<USER>/Downloads/<FOLDER\_NAME>/<FOLDER\_NAME> /opt/*

Where <USER> is your user account name, and <FOLDER\_NAME> is the name of the extracted GCC-ARM compiler folder. For example:

*sudo mv /home/kyle/Downloads/gcc-arm-none-eabi-8-2018-q4-major-linux/gcc-arm-none-eabi-8-2018-q4-major /opt/*

**4. Mbed CLI**

* To install and configure the Mbed CLI:
  + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following command and press ENTER:   
    *sudo pip install mbed-cli*
  + If prompted, type the administrative password and press ENTER
  + Set Mbed compiler path.

*mbed config -G GCC\_ARM\_PATH /opt/<FOLDER\_NAME>/bin*

*Where FOLDER\_NAME is the same as Step 3. For Example:*

*mbed config -G GCC\_ARM\_PATH /opt/gcc-arm-none-eabi-8-2018-q4-major/bin*

**5. Example**

* + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following commands:

*mbed import https://github.com/ARMmbed/mbed-os-example-blinky*

*cd mbed-os-example-blinky*

* + Once “Blinky” has been downloaded, compile and flash. Make sure that your Mbed supported device is plugged in to a USB port for this step. Use the command *‘mbed detect’* to ensure the device is plugged in.

mbed compile --target NUCLEO\_F401RE --toolchain GCC\_ARM --flash

Where target device in this example is a NUCLEO\_F401RE. Change the device depending on what the target is.

*OR*

*mbed compile --target KL25Z --toolchain GCC\_ARM –flash*

Where target device in this example is a FRDM-KL25Z. Change the device depending on what the target is.

* + If the process was successful, the LED on your board should now be blinking!

**Install Cadmium**

<INSERT CADMIUM INSTRUCTIONS HERE>

<https://github.com/SimulationEverywhere/cadmium>

**Download and Configure Boost**

Download the latest version of boost from the following link:

[https://www.boost.org/users/download/#live](https://www.boost.org/users/download/" \l "live)

If there are issues resort back to boost version 1.70.0:

<https://dl.bintray.com/boostorg/release/1.70.0/source/>

* + Right click on downloaded file and select “Extract Here” option. Wait for extraction to complete, it may take a minute.
  + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following command and press ENTER:

*sudo mv ~/Downloads/<FOLDER\_NAME>/ ~*

Where <FOLDER\_NAME> is the name of the extracted Boost folder. For example:

*sudo mv ~/Downloads/boost\_1\_70\_0/ ~*

Note: You may store these files in any directory. For simplicity these instructions use the home directory.

**Appendix**

**Installing Mbed Bootloader onto a Target Device**

Doing this in Linux is not straight forward, and not supported by ARM. I would suggest finding a Windows machine and following the steps described on the Mbed website. In Windows the process is trivial, and shouldn’t take more than a few minutes.

Here is the link to the instructions for the FRDM-KL25Z:

<https://os.mbed.com/handbook/Firmware-FRDM-KL25Z>

… But searching for ‘Mbed Firmware <Insert Board here>’ should give instructions for other common boards.

**Debugging with ‘Screen’ on Ubuntu**

You can listen on the serial port for UART communication from the device using the ‘screen’ program.

* + Open Ubuntu terminal. To open Ubuntu terminal press: "CONTROL+ALT+t"
  + Type on the Ubuntu terminal the following command and press ENTER:

*sudo apt-get install screen*

*mbed detect*

* + Mbed should tell you what port to listen to the device on, most likely it will be *dev/ttyACM0*

*screen /dev/ttyACM0*

\*\*\*\* I SAW THIS WARNING WHEN CALLING MBED DETECT, DOES NOT SEEM TO BE AN ISSUE \*\*\*\*

[mbed] WARNING: Missing Python modules were not auto-installed.

The Mbed OS tools in this program require the following Python modules: hidapi, pywin32, wmi

You can install all missing modules by running "pip install -r requirements.txt" in "/home/ben/ECadmium\_WIP/mbed-os"

On Posix systems (Linux, etc) you might have to switch to superuser account or use "sudo"

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WARNING: MBED\_ARM\_PATH set as environment variable but doesn't exist