Technical Workshop

Academic High Altitude Conference

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Stratospheric Ballooning Association

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Outline

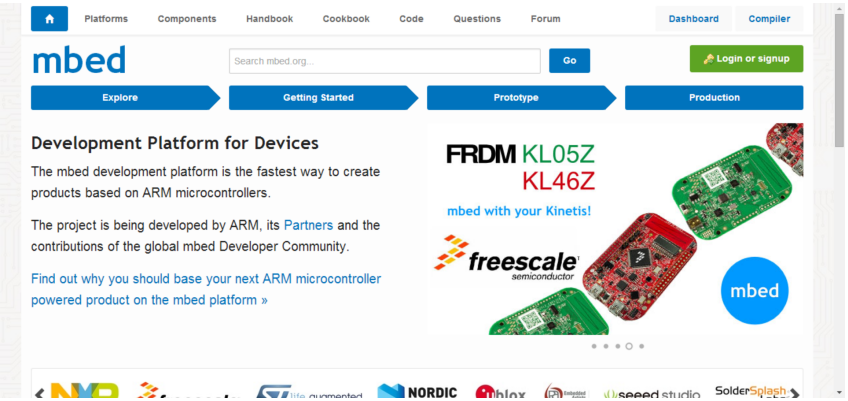
What is mbed?

The mbed platform is a collection of open source hardware and software to allow rapid ARM based prototyping

- Professional online compiler lets you work from any computer
- Integrated version control system lets you easily find and use libraries
- CMSIS based APIs let you work high level or bare metal
- Hardware abstraction layer insulates your application from hardware changes

Essentially a high performance Arduino with highly integrated tools to save you time!

Register on mbed



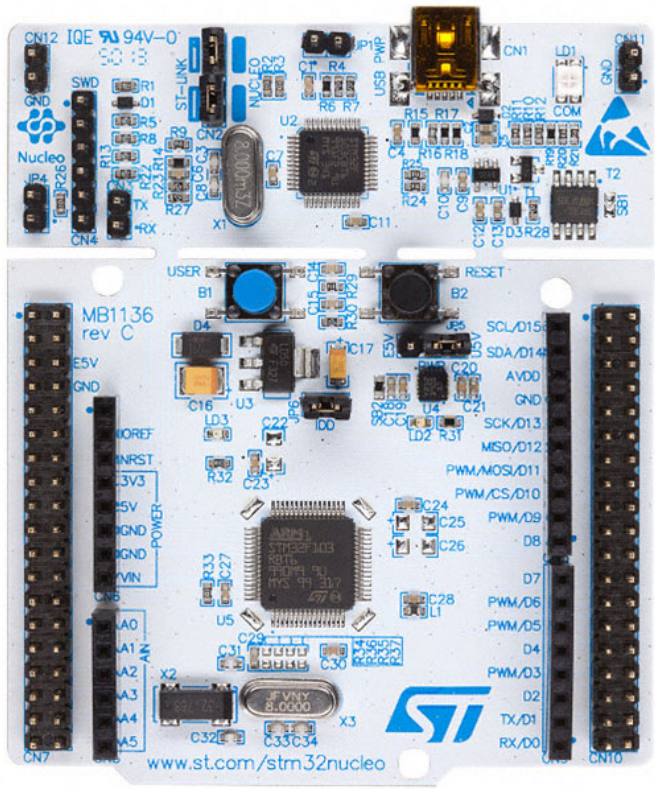
1. Navigate to `http://www.mbed.org`
2. Click the green "Login or signup" button
3. Click the "Signup" button
4. Follow the prompts
5. Confirm your e-mail address

Everyone should have an mbed account. You can create a team to share code between members of your organization.

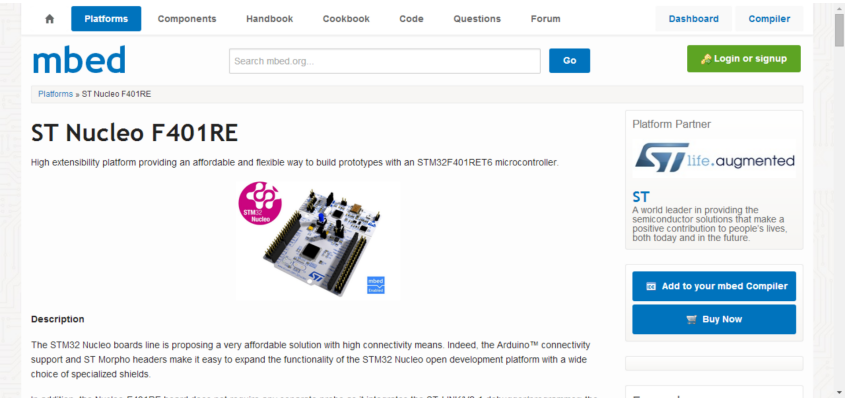
Nucleo Development Board

The Nucleo development board combines a USB programmer with a powerful STM32 processor and Arduino compatible headers

- ARM Cortex-M4 with FPU at 84 MHz
- 512 KBytes of flash memory
- 12 bit ADC at 2.4 Msps with up to 10 channels
- Up 3xUART, 3xI2C, 4xSPI interfaces



Add Nucleo to Your Account



1. Connect your Nucleo to your computer
2. Open the external drive the connects
3. Double click the mbed.htm file
4. Click "Add to your mbed Compiler"

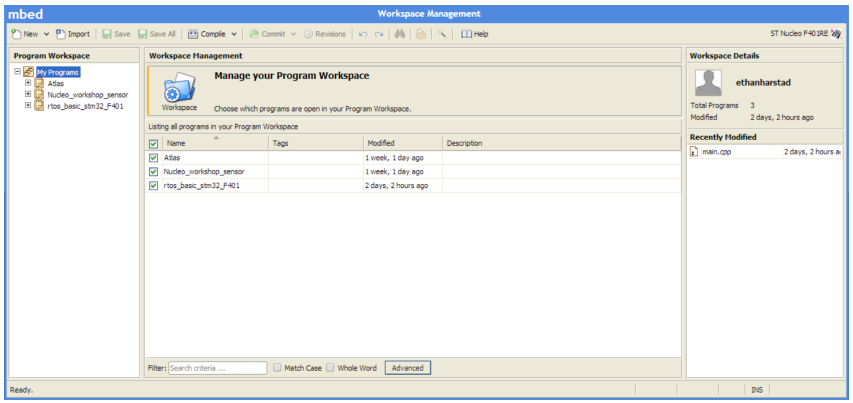
Note

You only need to do this once per account!

Install Drivers

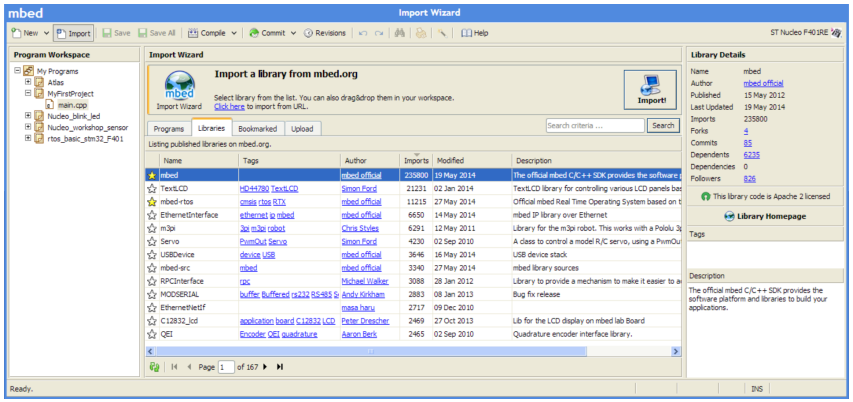
Outline

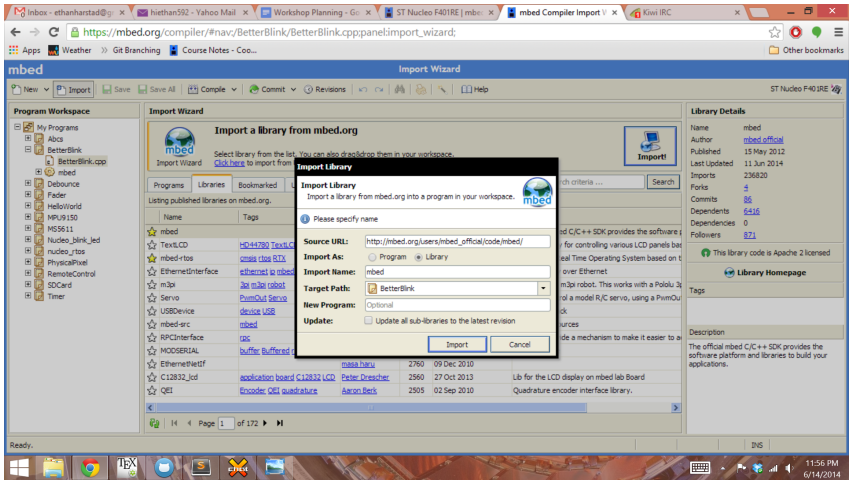
Creating a Program



1. Navigate to the mbed homepage and click the "Compiler" button
2. Click the "New" button and select "New Program"
3. Change the Template field to "Empty Program"
4. Give your program a name and click "OK"

Importing a Library





1. Click the "Import" button
2. Search for the "mbed" library
3. Select the library
4. Click the "Import!" button
5. Make sure the Target Path is your project root
6. Click "Import" one last time

Creating a New File

1. Click the root directory of your project to select it
2. Click the arrow next to "New" and select "New File"
3. Name the file "main.cpp" and click "OK"

Warning

Be sure to select the folder you want your file in before creating it!

You can name this file anything but it must have the .cpp extension. It is suggested that the main file be named "main" or the same as your project name (important later on).

Program Structure

```
1  /* Includes */
2  #include "mbed.h"
3
4  /* Global Variable
5     Declarations     */
6
7
8  /* Main Function */
9  int main() {
10   // Program code
11 }
```

Listing 1: main.cpp

- Line 2 includes the mbed library, **every** mbed program needs this.
- Line 8 is the main function, this is the entry point into your program. **Every** program needs a main function.
- Line 10 is a comment, everything after // is ignored. Everything between /* */ is also ignored.

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