nBlocksStudio1.0 Installation

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nBlocksStudio1.0 is using mbed-cli infrastructure including GCC compiler, for the microprocessor code compilation.
The Graphical interface is written in Python and is accessing the n-Blocks.net server when it starts, to get the definition of the Nodes

Install Python

Both mbed-cli and nBlocksStudio are based on Python.

- Download 32 bit windows installer for Python 2.7 (dont use 64bit Python installer, issues with pip)
- **Configure installer for adding Python path to system path** and complete Python 2.7 installation
- Restart Windows (otherwise pip fails)
- Test Python and pip from command line:

```
Python --version
pip --version
```

Both should work from any directory
If pip version is later than 9.0.3 mbed-cli might not work [1], so change to 9.0.3:

```
pip install -U pip==9.0.3
```

Install mbed-cli manually

References: [2] [3] [4]

- Install Git:
  - Download Git [5]
  - Run the .exe (for windows) to install it
- Install Mercurial:
  - Download Mercurial [6]

    - Run the .exe (for windows) to install it
- Install GCC:
    - Download GCC [7)]
    - Run installer
    - **Add Path to environment variable** and complete installation
- Verify Installations:

```
arm-none-eabi-gcc --version
git --version
hg --version
python --version
pip --version
```

- Install mbed cli from command prompt:

```
pip install mbed-cli
```

- Verify mbed installation:

```
mbed --version
```

- 07-March-2020, install Microsoft Visual C++ Compiler for Python 2.7: [8)]

mbed tips

mbed online compiler how to use OS2 or OS5

References: [9)]

```
 To make sure you are using the desired library delete the mbed
library from your project in the online compiler and then
  import either the mbed-dev (if you would like to use mbed OS 2)
or the mbed-os (if you prefer mbed OS 5).
```

How to import an existing program from mbed online compiler to mbed-cli and compile it

- From online compiler right click on the project and publish (or FORK) in to something like this: frequency_counter

    - If the project is copy from somebody else's project, probably have to fork to your own mbed space
- With administrative rights(???):

```
 mbed import
https://developer.mbed.org/users/chalikias/code/frequency_coun
ter/
```

- for a list of supported targets:

```
mbed compile -S
```

- Finnaly:

```
mbed compile -m LPC1768 -t GCC_ARM
```

How to create new mbed-cli project for OS2 or OS5

References: [10)]

- new OS5 project:

```
mbed new project1
```

- new OS2 project:

```
mbed new project2 --mbedlib
```

- new OS5 project at current directory:

```
mbed new .
```

Alternative method to import OS2 program from mbed online compiler

I had issues with the import method described above. This Alternative method works.Tested for Target LPC11U35_401 [20 May 2020]

- From mbed online compiler right-click on a **Program** in the **Program Workspace**: Export Program using

```
Export
```

  Toolchain

```
ZIP archive (with repositories)
```

- Extract the ZIP file to a Temporary folder.
- Create a new folder as new mbed OS2 project. This folder will be the project working folder:

```
mbed new project_name --mbedlib
```

- **From Inside** the Temporary folder copy all files and folders.
- Paste the copied files and folders, to **project_name** folder created from **mbed new project_name –mbedlib**
  - Just overwrite existing files when Windows asks
- From Command line Compile:

```
mbed compile -t GCC_ARM -m LPC11U35_401
```

Update mbed OS to a specific version

- go to mbed-os directory inside the project forlder

```
cd mbed-os
```

- Check the active release:

```
mbed releases
```

- update to the desired release, for example: mbed-os-5.7.7

```
update mbed-os-5.7.7
```

- Check again for the active release:

```
mbed releases
```

Install n-Blocks Studio

- Install all needed Python modules:

```
pip install panda3d
pip install pywin32
pip install pyuserinput
```

- Download the studio from bitbucket, using command line:

```
 hg clone
https://nimbus_it@bitbucket.org/nblocksstudio/prj_nblocksstudi
o
```

- Or update an existing nBlocksStudio directory using command line, but from inside the directory

```
 hg update
```

- Copy **mbed_code** outside the version controlled directory, so it will not be affected by future updates of the studio
- Go to **the new mbed_code** folder with command line
- Create new mbed **OS2** project inside the new folder: (preferable for now, OS5 is not tested well yet with nStudio)

```
 ...\mbed_code> mbed new . --mbedlib
```

- Or a new mbed **OS5** project inside the new folder:

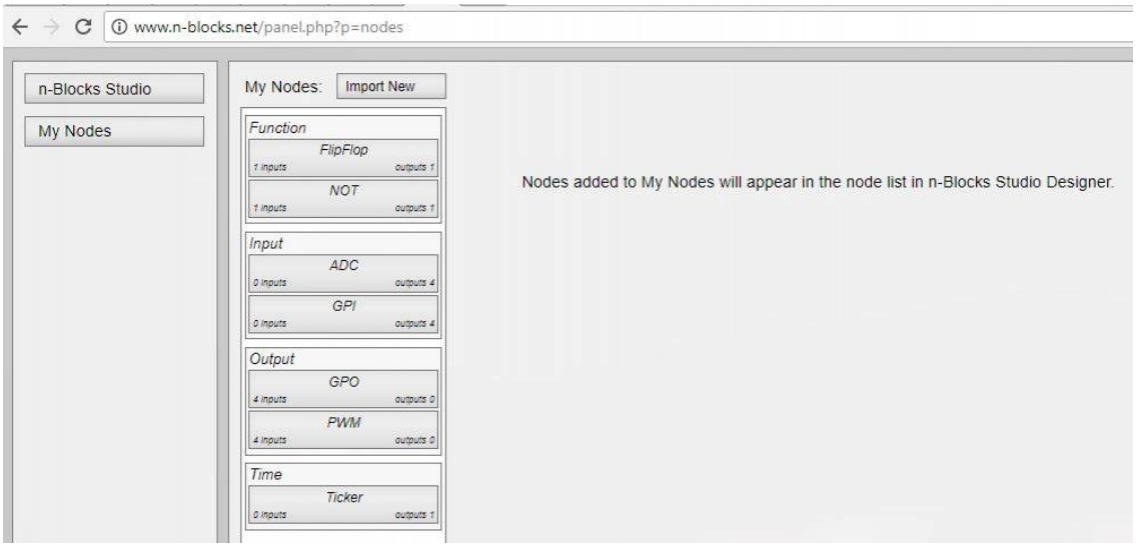
```
 ...\mbed_code> mbed new .
```

- Add any missing libraries:

```
 ...\mbed_code> mbed deploy
```

Use n-Blocks Studio

- Login to your nBlocksStudio [11)] account and add **nodes** to your account



- Start nBlocksStudio, from **Studio** folder with command line:

```
....\Studio\Launch.cmd
```

- On 07.02.2019 I had to edit nworkbench.py, to change[t]kinter to [T]kinter
- On 05.03.2020 this does not seem to be needed any more...

```
 from tkinter import TclError
```

to

```
from Tkinter import TclError
```

- ...and to install missing python modules:

```
 pip install enum
```

```
 pip install pywinusb
```

- ...one more March 2020:

```
 pip install requests
```

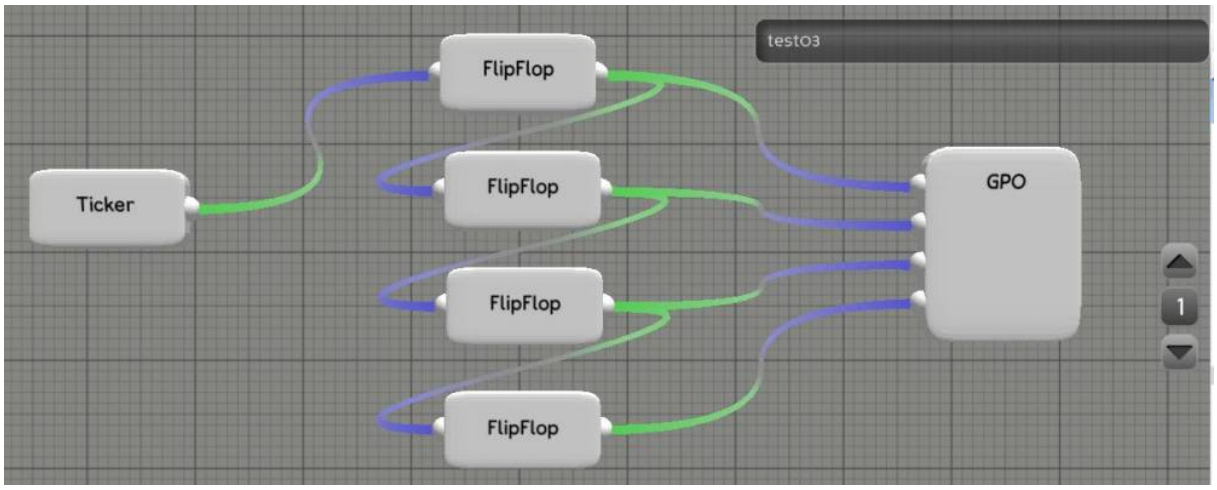
When exporting, save into the file **main.cpp** inside folder **mbed_code**, and build with:

```
C:....\mbed_code> mbed compile -t GCC_ARM -m LPC1768
```

Above creates a [.bin] file. (at ...\mbed_code\BUILD\LPC1768\GCC_ARM)
To automate the build process and use a different target n-Block/processor, call one of the **[tested]** batch files

- LPC1768.cmd (n-Bed)
- LPC11u35.cmd (n-DAP)
- L432KC.cmd (n-LP)
- L152RE.cmd (n-L15, n-CPU48)

4 bit binary counter example with n-Blocks Studio



This example diagram (a 4 bit binary counter) creates the main.cpp below:

```
/* ==================================================================
*
 *       Automatically generated by n-Blocks Studio Designer
*
 *
*
 *                          www.n-blocks.net
*
 * ==================================================================
*/
#include "nblocks.h"


// -*-*- List of node objects -*-*-
nBlock_Ticker                 nb_nBlockNode0_Ticker;
nBlock_FlipFlop               nb_nBlockNode13_FlipFlop;
nBlock_FlipFlop               nb_nBlockNode3_FlipFlop;
nBlock_GPO                    nb_nBlockNode12_GPO;
nBlock_FlipFlop               nb_nBlockNode14_FlipFlop;
```

```
nBlock_FlipFlop                nb_nBlockNode15_FlipFlop;

// -*-*- List of connection objects -*-*-
nBlockConnection          n_conn0(&nb_nBlockNode0_Ticker, 0,
&nb_nBlockNode3_FlipFlop, 0);
nBlockConnection          n_conn1(&nb_nBlockNode3_FlipFlop, 0,
&nb_nBlockNode12_GPO, 0);
nBlockConnection          n_conn2(&nb_nBlockNode3_FlipFlop, 0,
&nb_nBlockNode13_FlipFlop, 0);
nBlockConnection          n_conn3(&nb_nBlockNode13_FlipFlop, 0,
&nb_nBlockNode12_GPO, 1);
nBlockConnection          n_conn4(&nb_nBlockNode13_FlipFlop, 0,
&nb_nBlockNode14_FlipFlop, 0);
nBlockConnection          n_conn5(&nb_nBlockNode14_FlipFlop, 0,
&nb_nBlockNode12_GPO, 2);
nBlockConnection          n_conn6(&nb_nBlockNode14_FlipFlop, 0,
&nb_nBlockNode15_FlipFlop, 0);
nBlockConnection          n_conn7(&nb_nBlockNode15_FlipFlop, 0,
&nb_nBlockNode12_GPO, 3);


// -*-*- Main function -*-*-
int main(void) {
    SetupWorkbench();
    while(1) {
        // Your custom code here!
    }
}
```

References

1)
https://github.com/ARMmbed/mbed-os/issues/6763
2)
mbed 3 minutes quickstart video
3)
mbed os handbook
4)
mbed-cli: How to install manually
5)
download GIT
6)

download Mercurial
7)

download GCC from developer.arm.com
8)

http://aka.ms/vcpython27
9)

configure mbed-online for MBED-OS-2 or MBED-OS-5
10)

mbed-cli: creating and importing programs
11)

nBlocksStudio page

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