ARM mbed with us

Requirements

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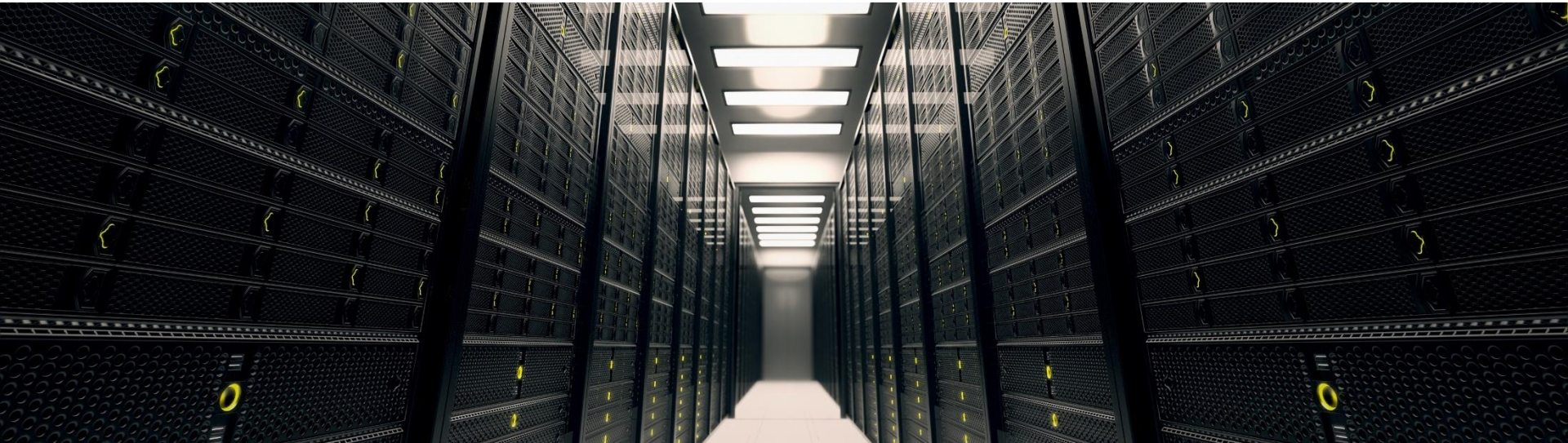
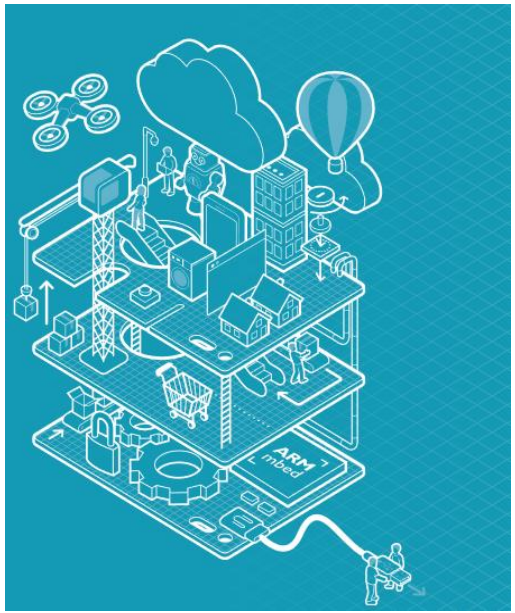


Summary

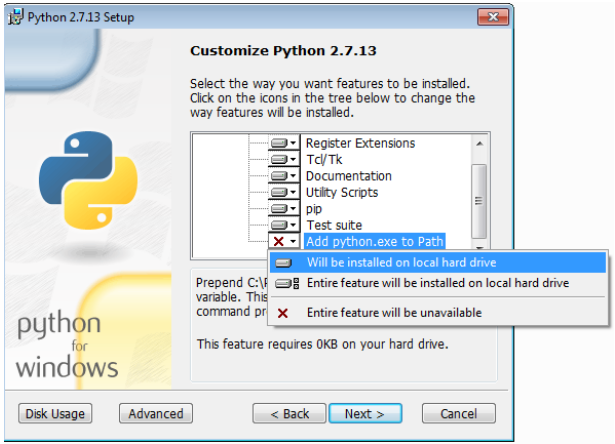
- These slides will explain you how to install all the tools needed to ARM mbed OS 5.
- Prerequisites:
  - Windows 7 or above
  - Internet connection
- You are going to install the following software:
  - Python
  - Git
  - Mercurial
  - GNU ARM Embedded Toolchain
  - mbed CLI
  - uVision 5
  - TeraTerm
  - STlink Utility & Driver
  - ST Virtual Com
- After this guide you will have your project ready for the seminar
- Note: this guide give you download links for x64 system



Python 2.7

- mbed CLI uses python to provide a command line development environment
- Python 3 is not currently supported

1. Download http://www.python.org/downloads website the installation executable python-2.7.13.msi
2. Launch it and select "*Install for all users*"
3. The only option to modify is to check "*add python.exe to Path*"



Git & Mercurial

– Git and Mercurial are version control software. They are used by mbed CLI in order to download projects from the repositories.

❖ Git 2.13:

1. Download https://git-scm.com/download/win from website the installation executable Git-2.13.2-64-bit.exe
2. Launch it and keep all default settings

❖ Mercurial 4.2:

1. Download https://www.mercurial-scm.org from website the installation executable tortoisehg-4.2.1-x64.msi
2. Launch it and keep all default settings

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GNU ARM Embedded Toolchain

– mbed CLI to compile the projects uses the GCC compiler for ARM architecture.

1. Download GNU GCC installation executable from the website:
   https://developer.arm.com/open-source/gnu-toolchain/gnu-rm/downloads

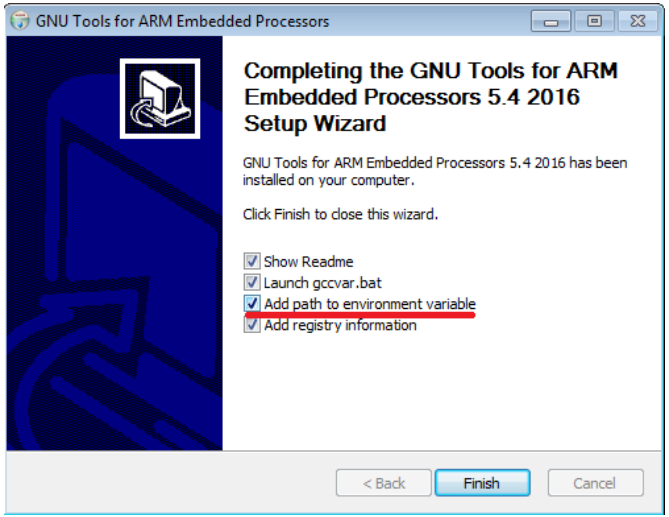
Windows 32-bit

File: gcc-arm-none-eabi-6-2017-q2-update-win32-sha2.exe (82.57 MB)

Download

2. The only one option to modify is to check in the end of the installation the field "*add path to environment variable*"

3. At the end of the installation will be opened a command prompt. Don't close it. It will be used in the next slide…



Verify Installation (1/2)

- It's important to be sure that all the installation software is correctly installed. Using the command prompt launch the following commands and verify the correspondence with the text marked in red.

1. arm-none-eabi-gcc --version (two minus: '- - version')
2. arm-none-eabi-gcc.exe (GNU Tools for ARM Embedded Processors 6-2017-q2-update) 6.3.1 20170620 (release)
3. python --version
   python 2.7.13
4. pip --version
   pip 9.0.1 from c:\python27\lib\site-packages (python 2.7)
5. git --version
   git version 2.13.2.windows.1
6. hg --version
   Mercurial SCM Distributed (version 4.2.1)

❖ Note: Do not close the prompt. It is needed in the next slides…

Verify Installation (2/2)

Screenshot pending to be updated with GNU GCC 6

– The output will be like this one:

```
C:\Users\mbed>arm-none-eabi-gcc --version
arm-none-eabi-gcc (GNU Tools for ARM Embedded Processors 6-2017-q2-update) 6.3.1
Copyright (C) 2016 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.


C:\Users\mbed>python --version
Python 2.7.13

C:\Users\mbed>pip --version
pip 9.0.1 from c:\python27\lib\site-packages (python 2.7)

C:\Users\mbed>git --version
git version 2.13.2.windows.1

C:\Users\mbed>hg --version
Mercurial SCM Distribuito (versione 4.2.1)
(see https://mercurial-scm.org for more information)

Copyright (C) 2005-2017 Matt Mackall and others
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

mbed CLI (1/2)

Screenshots pending to be updated with GNU GCC 6

- Now is time to install the mbed CLI.
- It is required the internet connection.

1. From the command prompt launch the command:
   pip install mbed-cli

```
C:\Program Files (x86)\GNU Tools ARM Embedded\5.4 2016q3>pip install mbed-cli
Collecting mbed-cli
  Downloading mbed-cli-1.1.1.zip (50kB)
    100% |################################| 51kB 328kB/s
Installing collected packages: mbed-cli
  Running setup.py install for mbed-cli ... done
Successfully installed mbed-cli-1.1.1

C:\Program Files (x86)\GNU Tools ARM Embedded\5.4 2016q3>_
```

2. You have to be sure that it is successfully installed using the command
   mbed --version

```
C:\Program Files (x86)\GNU Tools ARM Embedded\5.4 2016q3>mbed --version
1.1.1
```

mbed CLI (2/2)

3. mbed CLI requires other python modules, you can install most of them with the command:
- *pip install IntelHex jinja2 bs4 fuzzywuzzy prettytable colorama pyserial junit_xml pyyaml requests mbed_ls setuptools_scm*

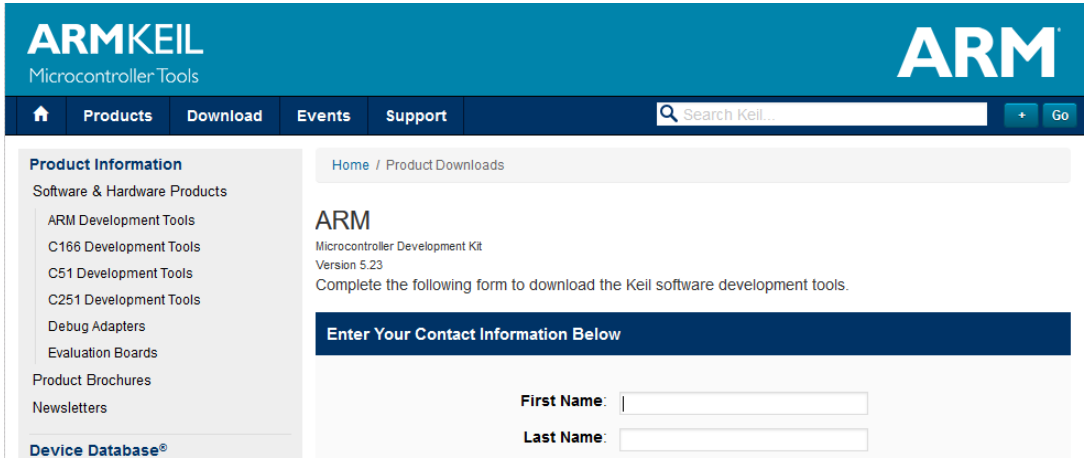
4. After that install also these modules:
- *pip install mbed-host-tests mbed-greentea*

uVision 5 (1/4)

– mbed CLI is a development tool to be used in the console. It has a feature to export the project for uVision MDK-ARM. In our hands on we will use it as GUI environment

❖ Installation:

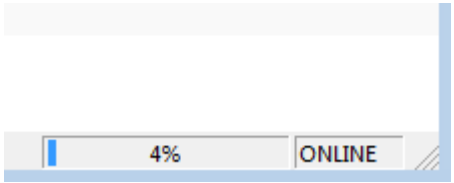
1. To download the uVision you have to register an account to the page https://www.keil.com/demo/eval/arm.htm



KEIL™ Tools by ARM

uVision 5 (2/4)

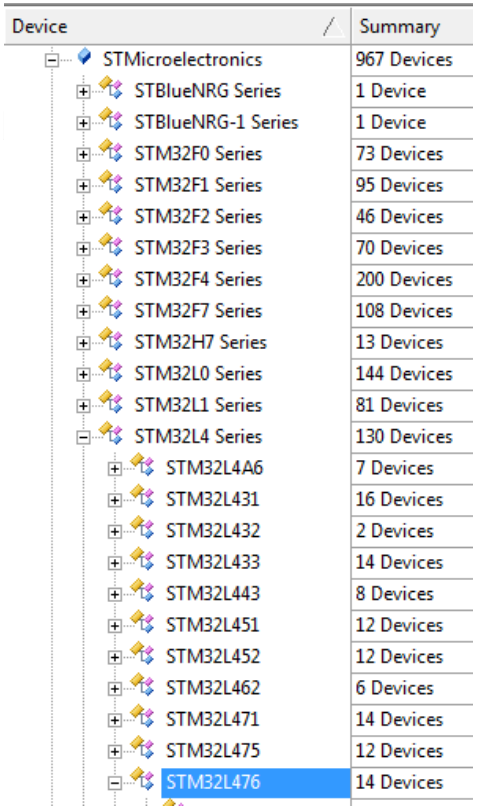
2. Download and install it leaving all the default options of installation
3. After the installation will popup the Pack Installer. It will start to update itself. Wait it finish. You can see the downloading progression bottom right corner



❖ Package needed:

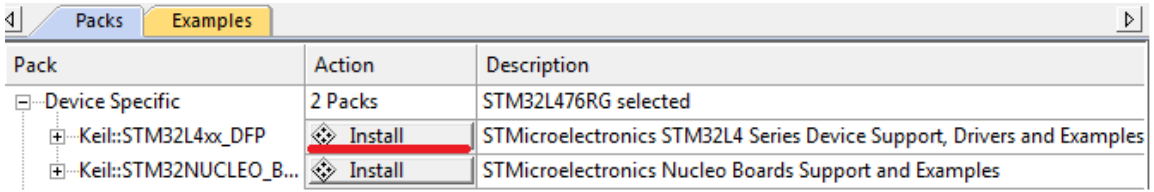
4. In order to install the package needed by our project select the STM32L476 device from the left:

STMicroelectronics → STM32L4 → STM32L476



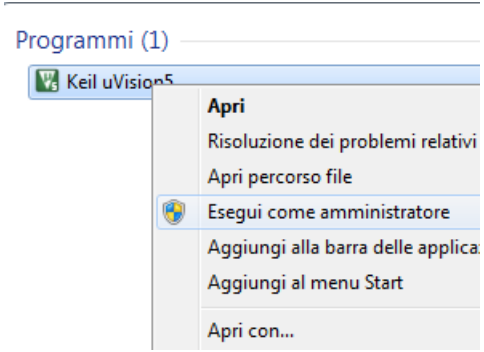
uVision 5 (3/4)

5. Now from the right area there is a list of packages installable for the STM32L476, click on the button marked in red.



❖ ARM KEIL offers a free professional license for **7 days**. Install this license in order to have it active for the day of the seminar.

1. Close the Pack Installer and launch uVision 5 as administrator:



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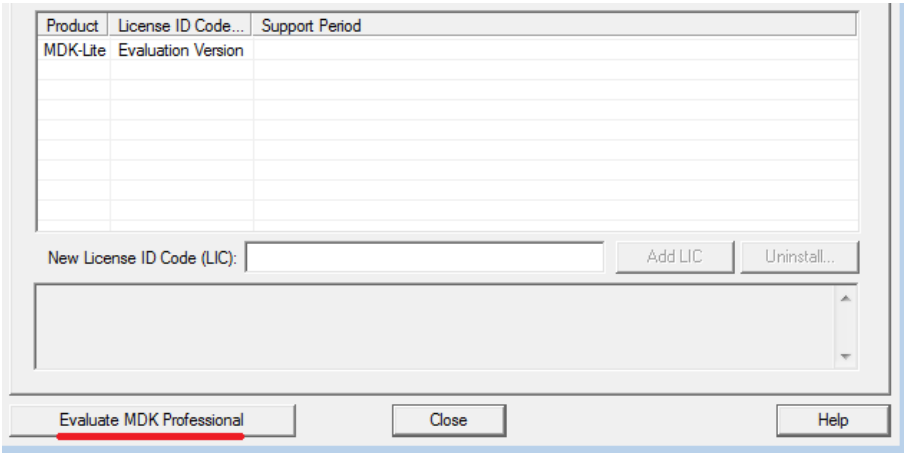
uVision 5 (4/4)

2. From the menu go to “*File → License Management...*”
3. Will popup the License Management window, click on “*Evaluate MDK Professional*” button

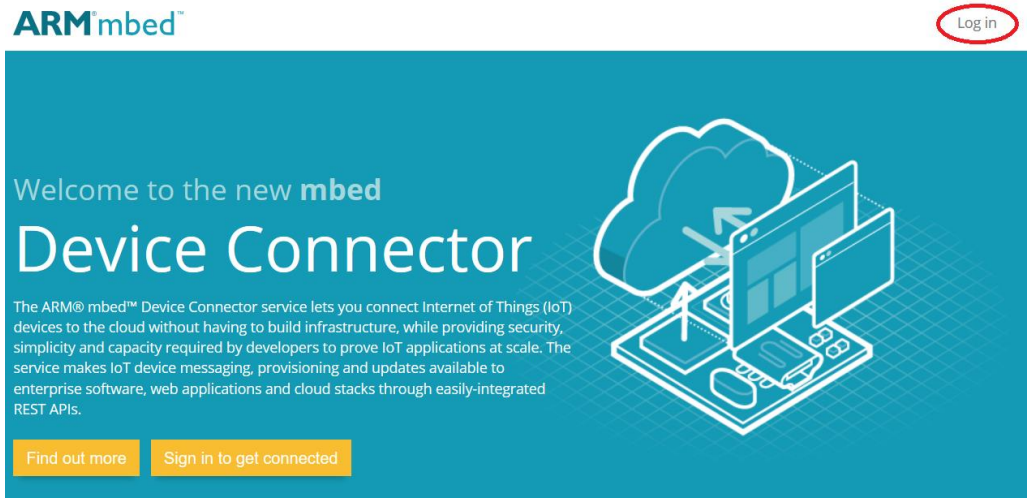


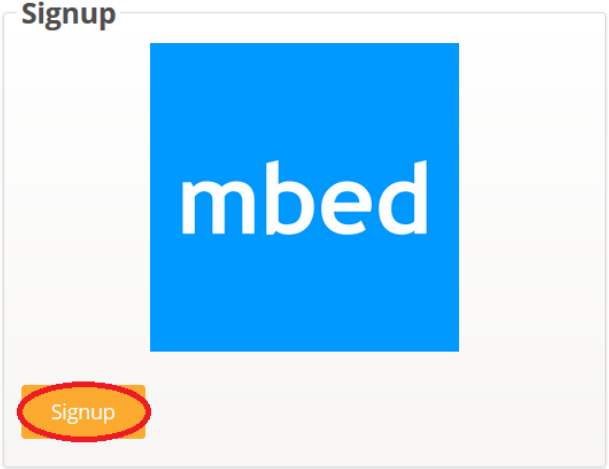
4. Click on the button to start the temporary license. Now you have uVision ready for the hands-on.

KEIL™ Tools by ARM

Create a developer mbed account

- The demo of the sensor node will send data to the cloud named Device Connector. It is required to register to https://connector.mbed.com/ page





- Click on *Log in* and then in *Signup*
- Save *login* and *password* for next use

Virtual Com Port & ST-Link v2 driver

– At the seminar you will connect the board to your PC. It will be necessary to install the drivers. Please download them from the ST webpage http://www.st.com/en/embedded-software/stsw-link009.html

GET SOFTWARE

Part Number	Software Version	Marketing Status	Supplier	Order from ST
STSW-LINK009	1.02	Active	ST	Get Software

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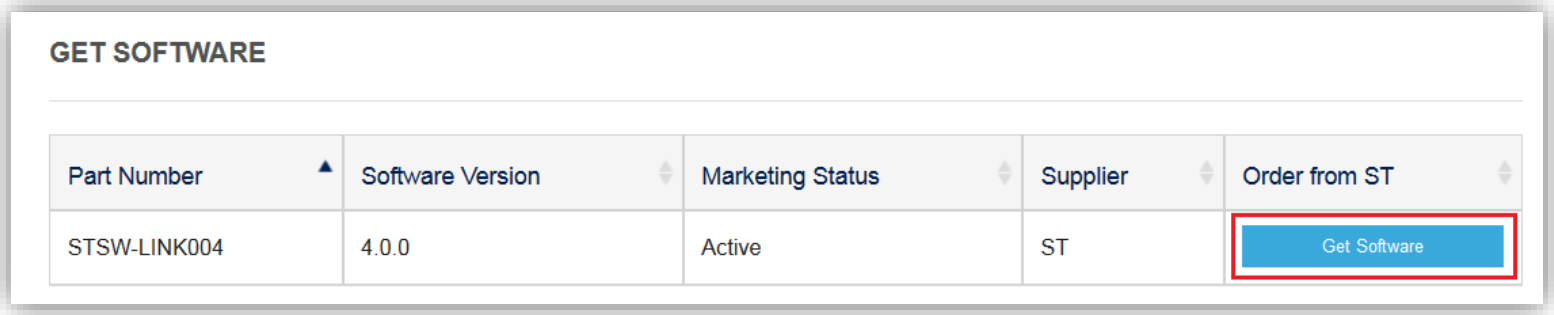
STLink-Utility (STSW-LINK004)

– At the seminar you will connect the board to your PC.
Please download and install STLink-Utility from the ST webpage:
http://www.st.com/content/st_com/en/products/embedded-software/development-tool-software/stsw-link004.html



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TeraTerm

– At the seminar you will connect the board to your PC.
Please download and install TeraTerm (default installation):
https://ttssh2.osdn.jp/index.html.en

Thank you!