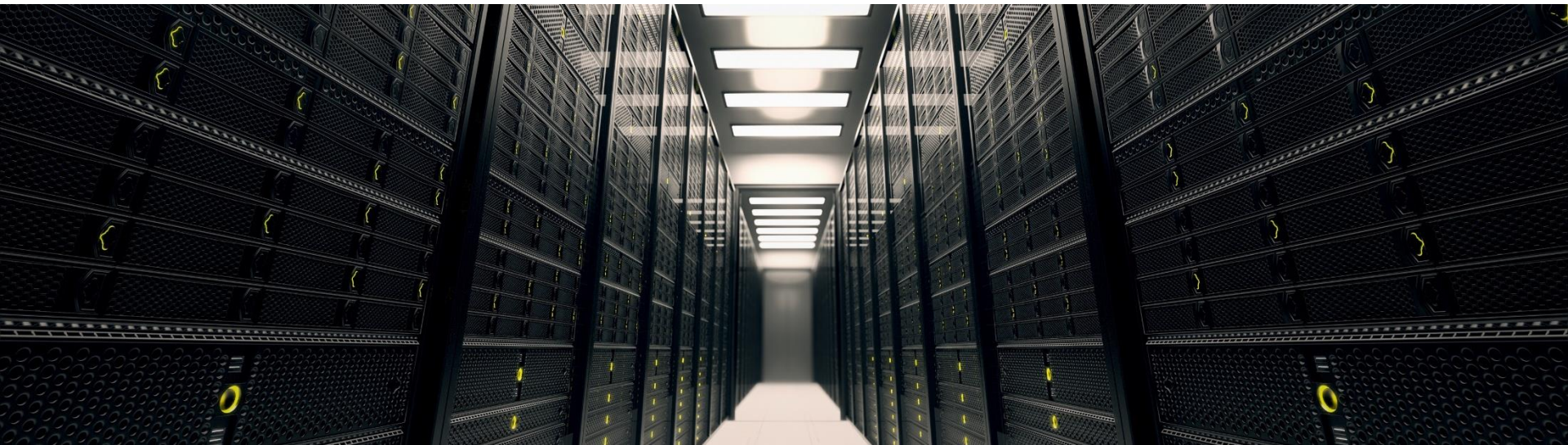


# ARM mbed with us

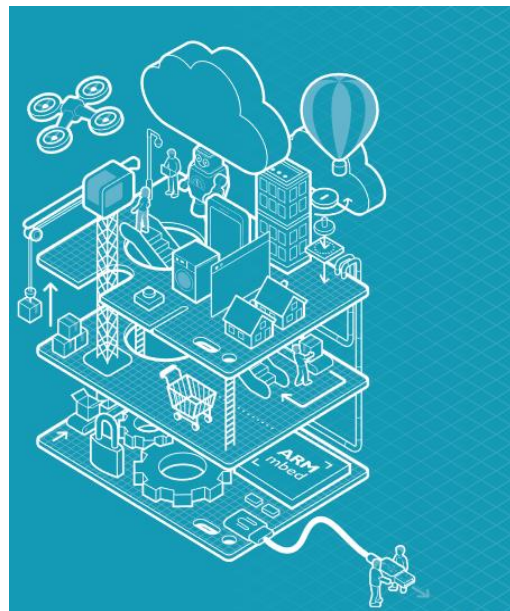
## Requirements

AVNET<sup>®</sup> SILICA



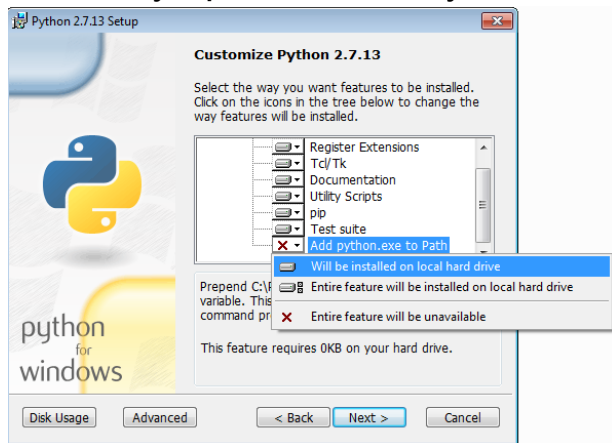
# Summary

- 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



# GNU ARM Embedded Toolchain



ARM®

- 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>

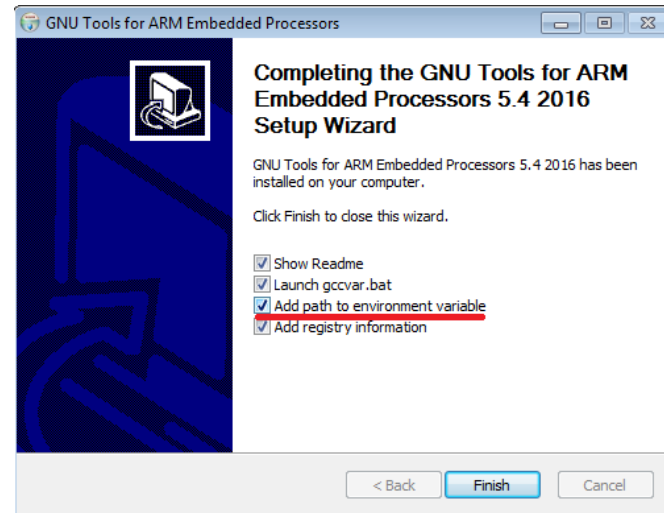
## Windows 32-bit

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)

- The output will be like this one:

Screenshot pending to  
be updated with GNU  
GCC 6

```
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*

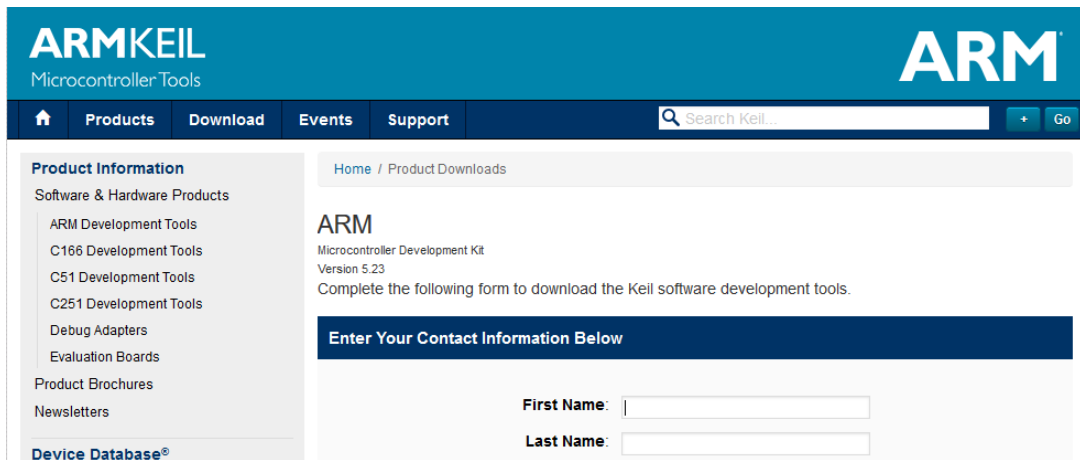


## uVision 5 (1/4)

- 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>



The screenshot shows the ARMKEIL website interface. The top header is blue with 'ARMKEIL' and 'Microcontroller Tools' on the left, and the 'ARM' logo on the right. Below the header is a navigation bar with links: Home, Products, Download, Events, and Support. A search bar is also present. The main content area is divided into two columns. The left column contains a 'Product Information' sidebar with links to various software and hardware products. The right column displays the 'ARM Microcontroller Development Kit Version 5.23' and a form titled 'Enter Your Contact Information Below' with fields for 'First Name' and 'Last Name'.

**ARMKEIL**  
Microcontroller Tools

**ARM**

Home Products Download Events Support Search Keil... + Go

**Product Information**

Software & Hardware Products

- ARM Development Tools
- C166 Development Tools
- C51 Development Tools
- C251 Development Tools
- Debug Adapters
- Evaluation Boards
- Product Brochures
- Newsletters

**Device Database®**

Home / Product Downloads

**ARM**  
Microcontroller Development Kit  
Version 5.23  
Complete the following form to download the Keil software development tools.

**Enter Your Contact Information Below**

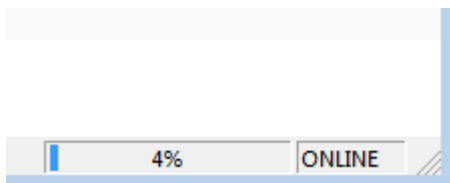
First Name:

Last Name:



## 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:

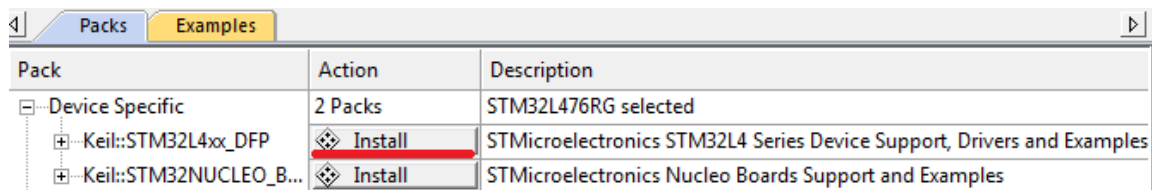
4. In order to install the package needed by our project select the STM32L476 device from the left:

*STMicroelectronics* → *STM32L4* → *STM32L476*

Device	Summary
STMicroelectronics	967 Devices
STBlueNRG Series	1 Device
STBlueNRG-1 Series	1 Device
STM32F0 Series	73 Devices
STM32F1 Series	95 Devices
STM32F2 Series	46 Devices
STM32F3 Series	70 Devices
STM32F4 Series	200 Devices
STM32F7 Series	108 Devices
STM32H7 Series	13 Devices
STM32L0 Series	144 Devices
STM32L1 Series	81 Devices
STM32L4 Series	130 Devices
STM32L4A6	7 Devices
STM32L431	16 Devices
STM32L432	2 Devices
STM32L433	14 Devices
STM32L443	8 Devices
STM32L451	12 Devices
STM32L452	12 Devices
STM32L462	6 Devices
STM32L471	14 Devices
STM32L475	12 Devices
STM32L476	14 Devices

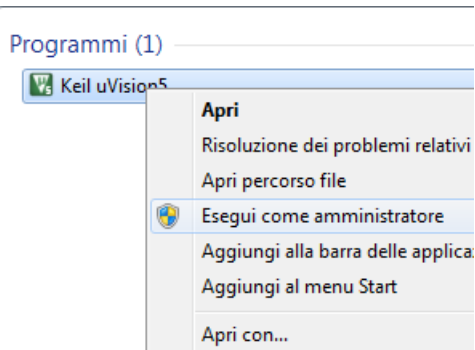
## uVision 5 (3/4)

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



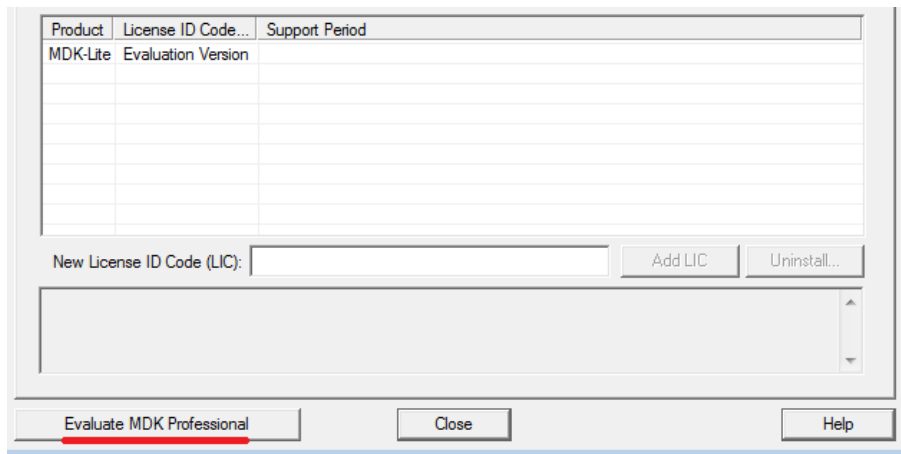
- ❖ ARM KEIL offers a free professional license for **7 days**. Install this license in order to have it active for the day of the seminar.

- Close the Pack Installer and launch uVision 5 as administrator:



## 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.

# 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

ARM mbed™

Log in

Welcome to the new mbed

## Device Connector

The ARM® mbed™ Device Connector service lets you connect Internet of Things (IoT) devices to the cloud without having to build infrastructure, while providing security, simplicity and capacity required by developers to prove IoT applications at scale. The service makes IoT device messaging, provisioning and updates available to enterprise software, web applications and cloud stacks through easily-integrated REST APIs.

Find out more

Sign in to get connected



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

Signup

mbed

Signup

# 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	<a href="#">Get Software</a>



## 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](http://www.st.com/content/st_com/en/products/embedded-software/development-tool-software/stsw-link004.html)

GET SOFTWARE				
Part Number ▲	Software Version ▼	Marketing Status ▼	Supplier ▼	Order from ST ▼
STSW-LINK004	4.0.0	Active	ST	<a href="#">Get Software</a>





# 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!