

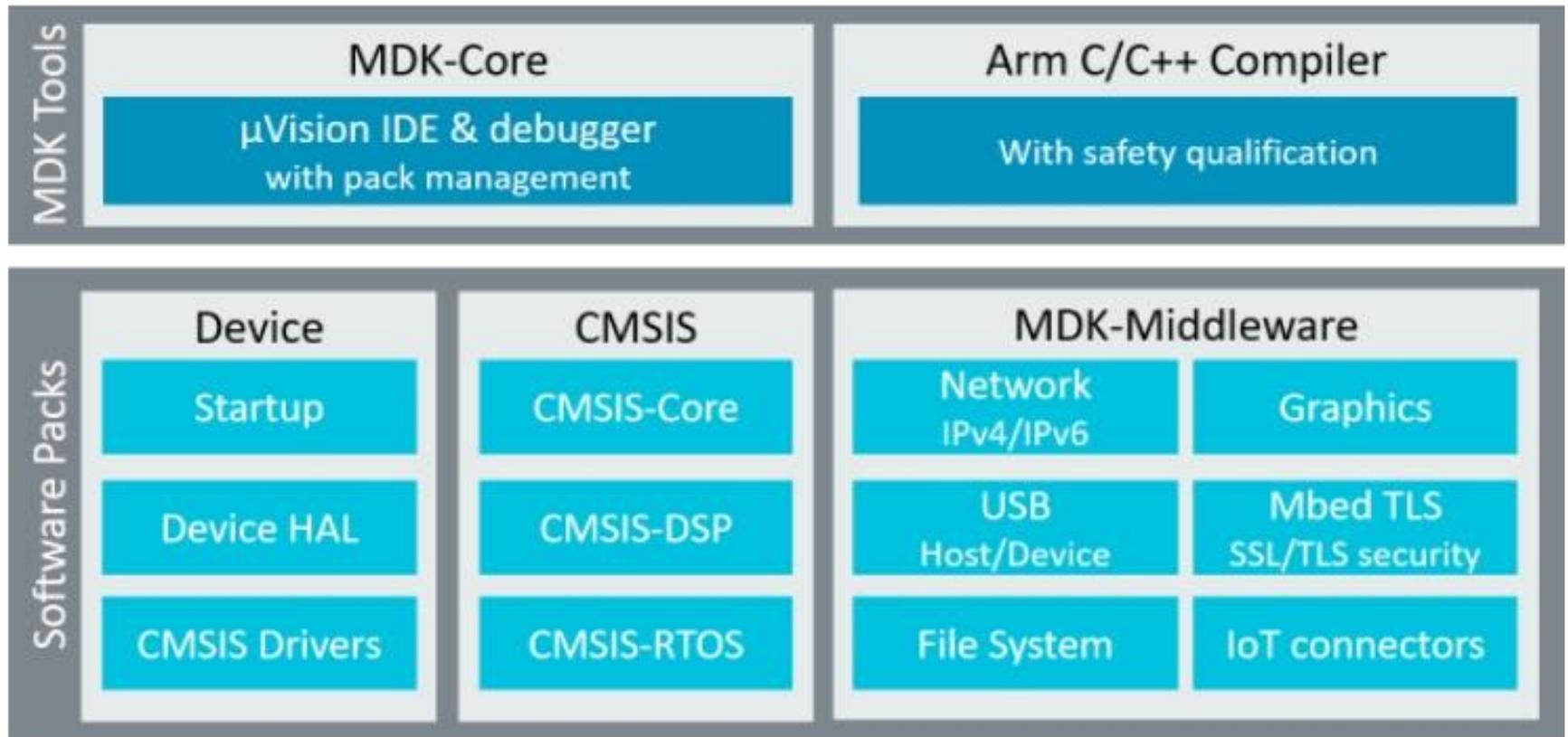


# Keil MDK uVision

# Overview

- Keil® MDK is the most comprehensive software development solution for Arm®-based microcontrollers and includes all components that you need to create, build, and debug embedded applications
- MDK includes two **Arm C/C++ Compilers** with assembler, linker, and highly optimize run-time libraries that are tailored for optimum code size and performance.

# Product components



## Download and install Keil MDK (lite)

Connect to

<https://www.keil.com/download/product/>

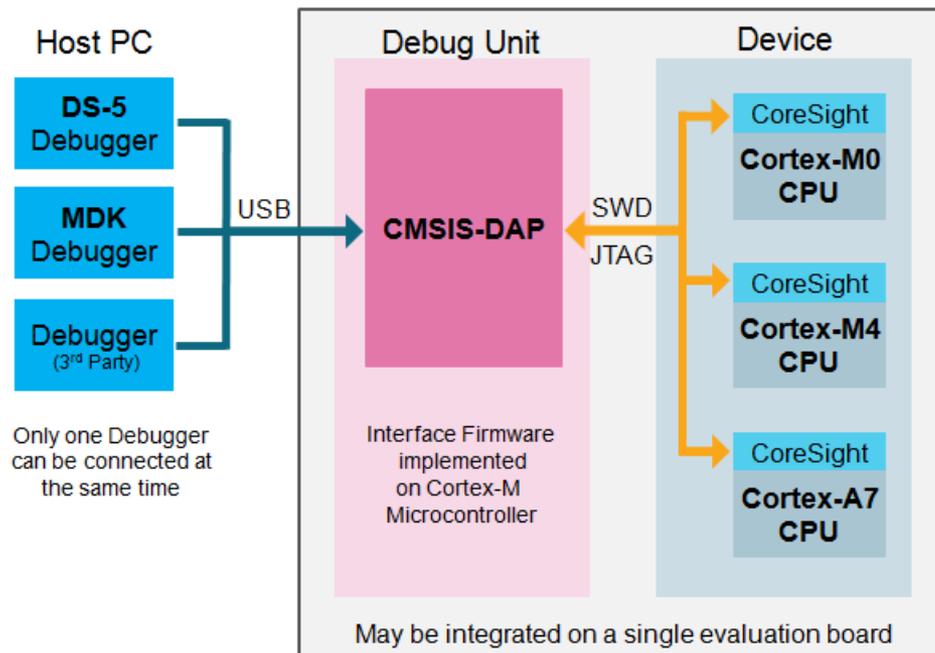
- provide requested information and download
- launch
- In (Project... Manage...) Pack installer:
- *device...* NXP... MKL25Z128xxx4... 16KbRAM, 128KbROM
- alternatively, *boards...* FRDM-KL25Z
  - click on the link... device family pack... download (maybe useless, see next step)
- *packs...* device specifics... *Keil::Kinetis\_KLxx\_DFP...* install
- *examples: CMSIS-RTOS Blinky FRDM-KL25Z...* copy... ok

# Keil MDK

- Project... open project... Blinky... *Blinky.uvprojx*
  - MDK projects have *.uvprojx* extension
- project... options for target... debug... *use CMSIS-DAP Debugger*
- project... build target
- flash... download
- the *s/w may not* start automatically
  - press the reset button
- the executable is the *.axf* file in...*<project\_name>\Flash*
  - executable true size may be seen (in Windows) by removing “debug info” and “browse info” in “options for target”... “output”

# CMSIS-DAP debugger

- CMSIS-DAP is the interface firmware for a Debug Unit that connects the Debug Port to USB.
- <http://www.keil.com/support/man/docs/dapdebug/>



## Keil MDK: debugging

- Project... build target
- Debug... start debug session (loads the executable)
- Debug... run (F5)
- You can insert/remove breakpoints (F9), step (F11), step over (F10), step out (ctrlF11)...
- To restart: the only way is to stop/start debug execution?
- You have to stop debug session before rebuilding

## Keil MDK: in order to use the full version

- ... you need to exploit the license kindly provided by ARM
- server side: the license server has already been installed on a computer of the Dept
  - client side: in Keil (**run as Administrator**):
    - File... license management... FlexLM License
    - edit
    - [8224@SRV7.di3.units.it](mailto:8224@SRV7.di3.units.it)
    - Use FlexLM / FlexNet
  - in Windows: in Network settings... Wireless Network Connection... TCP/IPv4... properties, “Obtain DNS server address automatically” must be set
  - when working outside campus, **connection to the license server has to be via VPN**
    - instructions for VPN installation are on <https://vpn-client.units.it/>

# Manuals

- Online manuals:

<http://www2.keil.com/mdk5/docs>

- A very good tutorial: *apnt\_257.pdf*

# NXP SDK for Keil

- Connect to <https://www.nxp.com/mcuxpresso/sdk>
- download the user guide
- create and download the SDK
  - login...
  - download... select development board... board... Kinetis... FRDM-KL25Z
  - name... SDK\_2.2.0\_FRDM-KL25Z\_for\_Keil
  - build MCUXpresso SDK
  - toolchain/IDE: Keil MDK
  - sw components: CMSIS DSP library, USB, FreeRTOS
  - save the link to the SDK API reference manual
  - download SDK
- put in a folder and extract

## NXP examples

Many examples are available in the NXP SDK for Keil

- Project... open... *<projectname>.uvprojx*
  - Note: in the left window, Keil only shows the active project
- For example: *boards... demo apps... hello world*
  - Programs... options... debug... use *CMSIS-DAP Debugger*
  - Hello\_world needs *teraterm* at 115200 Baud
  - board reset may be needed
- executables (.bin files) can be directly loaded on the board by dragging them onto the D:\DAPLINK drive
- a simple command line shell is available in *shell* (*teraterm* is needed of course)
- in *usb\_examples/usb\_device\_audio\_generator\_lite* the other USB connector is used