

# Becoming mbed Enabled

**ARM**

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ARM mbed Connect / Shenzhen, China  
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# Agenda

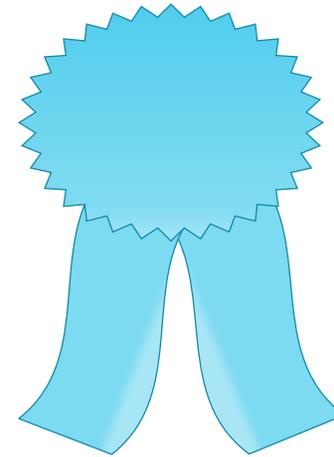
- What is mbed Enabled?
- Categories/Technical requirements
  - Boards
  - Interface
  - Components (coming soon)
- Other requirements
  - On-going support
- Process
  - Timescale



# mbed Enabled



- A mark of quality assurance
  - Interoperability for hardware and tools that can be trusted
- Vendors clearly identify their products as interoperable
- Developers expectations are clearly defined
- <http://mbed.com/mbed-enabled>



# Benefits for Vendors

- Make your product known to the mbed developer community
- Get your product listed on the mbed.com
- Use the 'mbed Enabled' logo
- Participate in mbed marketing activities
- Opportunity to show your product at ARM trade shows
- Be eligible to be featured as an ARM mbed product case study



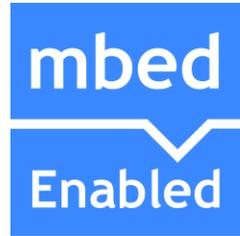
# Benefits for Developers



- Assurance that products comply with best practices for ease of development
- Interoperability with mbed Enabled products



# Versions



Original mbed Enabled program

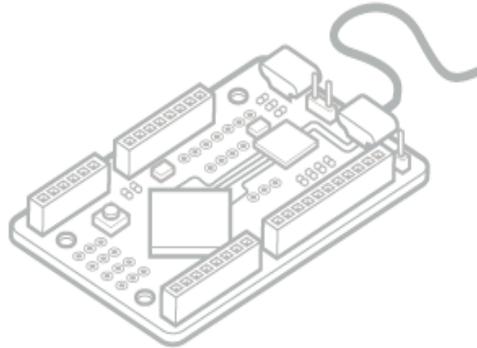
Deprecated



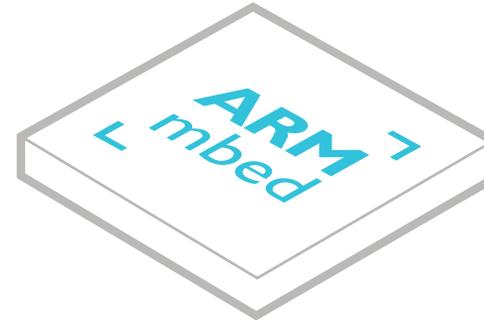
mbed Enabled for mbed OS 2 / 5

Focus of Session

# Categories

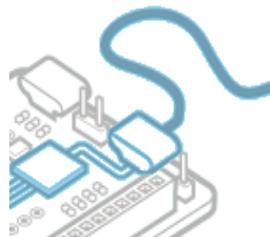


- **Hardware Platforms**  
(MCU Boards)



- **Components** (Coming Soon to mbed OS 5 )  
(Sensors, Radios, Modules, etc.  
on Shields or any form factor)

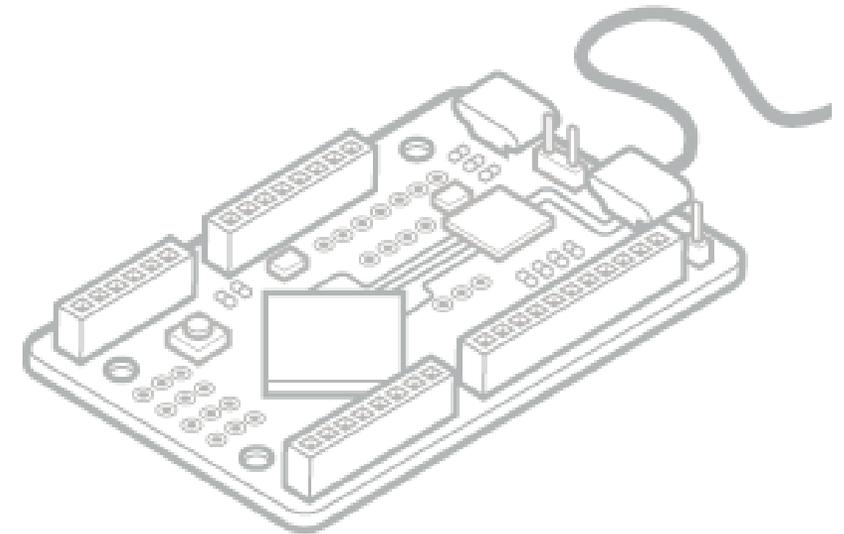
- **Interface**  
(Debug Circuits)



# Technical Requirements Boards



- Target port merged mainline to mbed OS library at [github.com/armmbed/mbed-os](https://github.com/armmbed/mbed-os)
- Target port follows mbed OS 5.0 porting and contribution guidelines
- mbed HAL requirements:
  - Timing resource capable of **1us** interval
  - Low power timing resource capable of **1ms** interval
  - Dynamic GPIO configuration
  - Sleep able to enter WFI
- mbed RTOS requirements:
  - Device has SysTick or RTOS timer
- Passes test suite
  - u-test framework
  - CMSIS-CORE
  - mbed HAL
  - mbed RTOS



# Compliance Criteria

# Boards

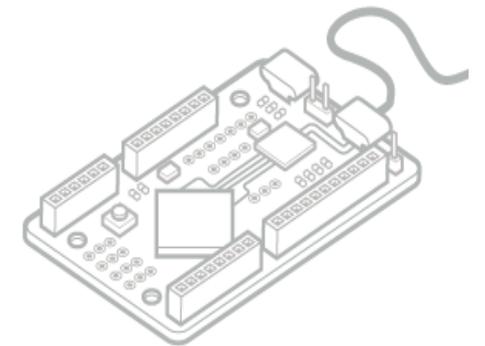


## Hardware & Software Support

- MUST implement CMSIS-CORE, mbed HAL
- MUST implement mbed RTOS APIs (based on CMSIS-RTOS standard)
- MUST support all major compilers for ARM architecture – GCC ARM, ARM Compiler 5 and IAR
- SHOULD implement entropy source support, if provided by the SoC, module or board
- MUST have an mbed Enabled Interface circuit and firmware available
- MUST provide a comprehensive example using all onboard Components
- SHOULD use supported Components

## Testing

- MUST pass all mbed OS validation tests for the current major release
- MUST provide 10x units for validation and regression testing

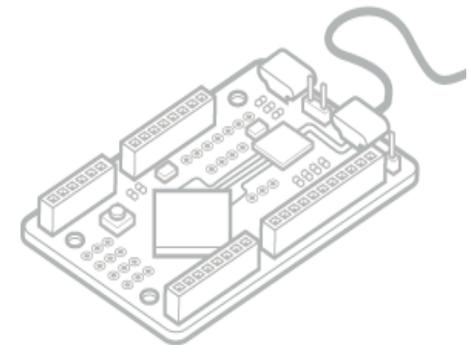


# Compliance Criteria Boards



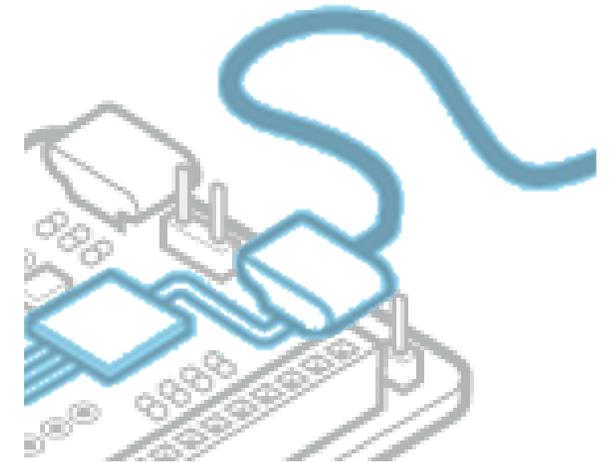
## Marketing, Documentation, Support

- MUST have a pinout diagram based on the mbed pinout template
- MUST provide product photo, description, features and other marketing collateral
- MUST have technical documents available for download from the mbed Developer website
- MUST have EDA consumable files available for download from the mbed Developer website
- MUST have a public issue tracker and feedback mechanism
- MUST have a license identifiable using SPDX
- MUST have an mbed Partner Agreement



# Technical Requirements      Interface

- Compatible with and supported by mbed host test & mbed-ls
- Has product specification & schematic publicly available
- Has a public issue tracker and feedback mechanism
- Compatible with Windows, Mac and Linux (common versions)
- Implements the following USB Composite Device features
  - **USB Filesystem** -- A disk drive with product information. Drag-and-drop action programs the target MCU memory.
  - **USB Serial Port** -- A virtual com port that exposes UART transmit and receive pins. The 'Send Break' command results in a reset sequence.
  - **USB Debug** -- A connection that allows programming and debugging from the host PC.

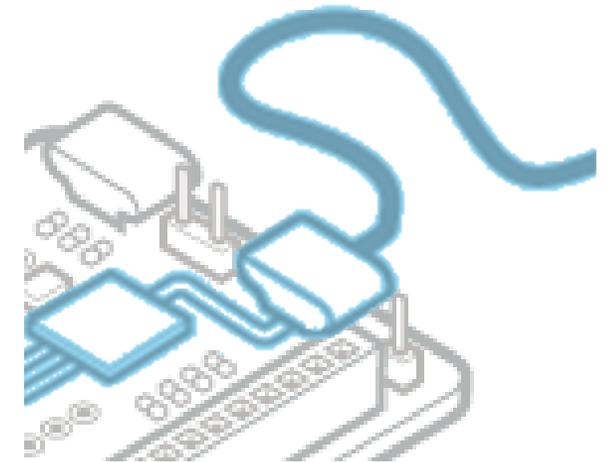


# Compliance Criteria Interface



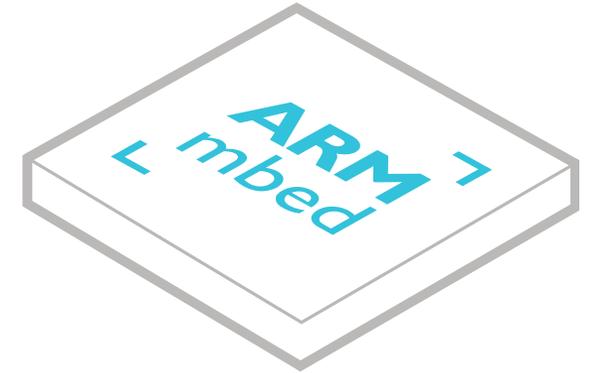
*~20 Specifications, here are the highlights*

- USB MSC -- Mass Storage Device Class
  - MUST support programming hex files
  - MUST contain a read-only HTML-5 compliant htm file
  - MUST have a details file containing board ID and circuit ID
  - SHOULD support programming binary files
  - SHOULD redirect to the mbed.com product specific page
- USB CDC -- Communication Device Class
  - MUST support at all standard baudrates 9600 thru 115200
- USB HID -- Human Interface Device or similar
  - MUST support a channel used for debugging
  - SHOULD be CMSIS-DAP



# Technical Requirements Components

mbed 2 (“Classic”), Coming Soon to mbed OS 5



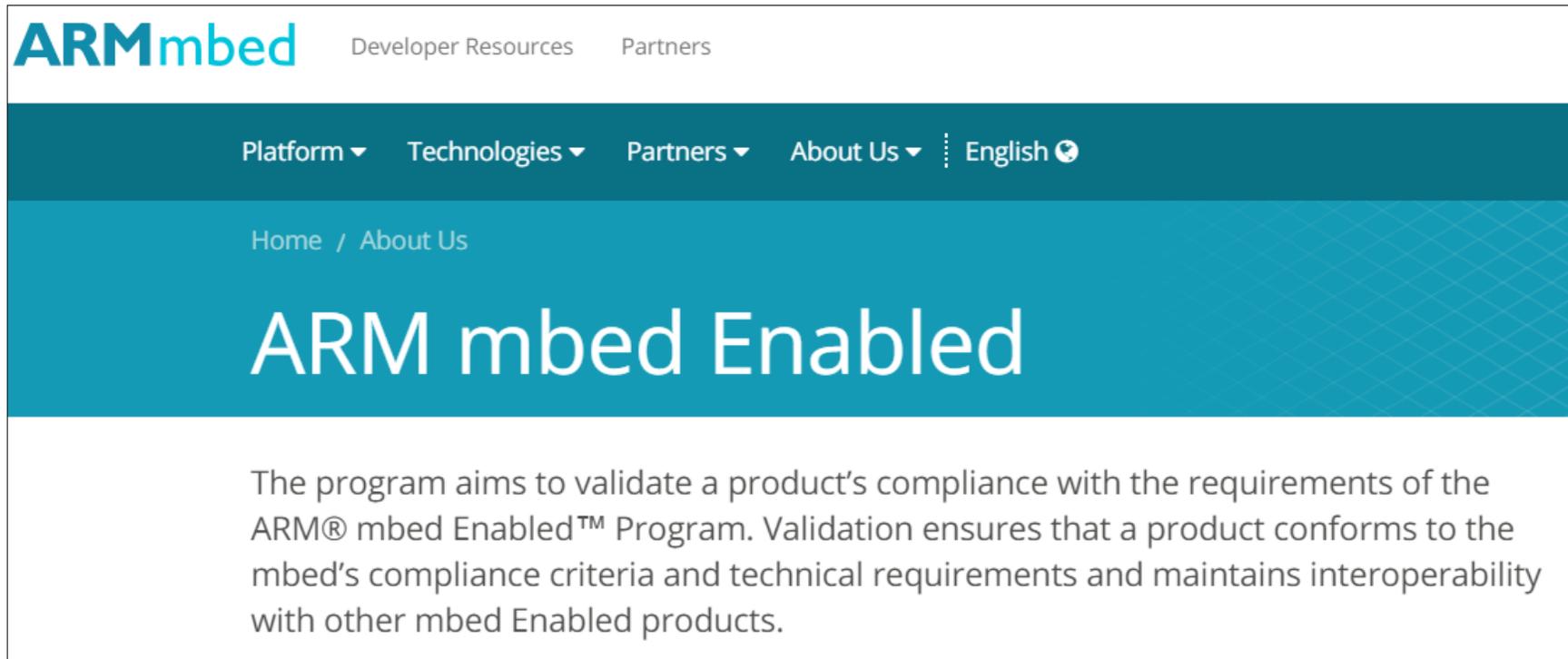
1. Fully functional component library and example(s)
  - Should work on a minimum of 10 Hardware Platforms
2. Developer Documentation
  - Official component page w/ pinout, schematics, and info
  - Official component library
  - Component library implements established C++ APIs and/or [mbed common coding practices](#)
  - Component example(s)
  - Component unit and functional tests
3. Designated F/AE on <http://developer.mbed.org> to monitor community questions/feedback

# On-Going Support Requirements

- **MUST** have a support engineer on the mbed Developer website to monitor community

# Where to find information and application forms?

- <https://www.mbed.com/about-mbed/mbed-enabled>



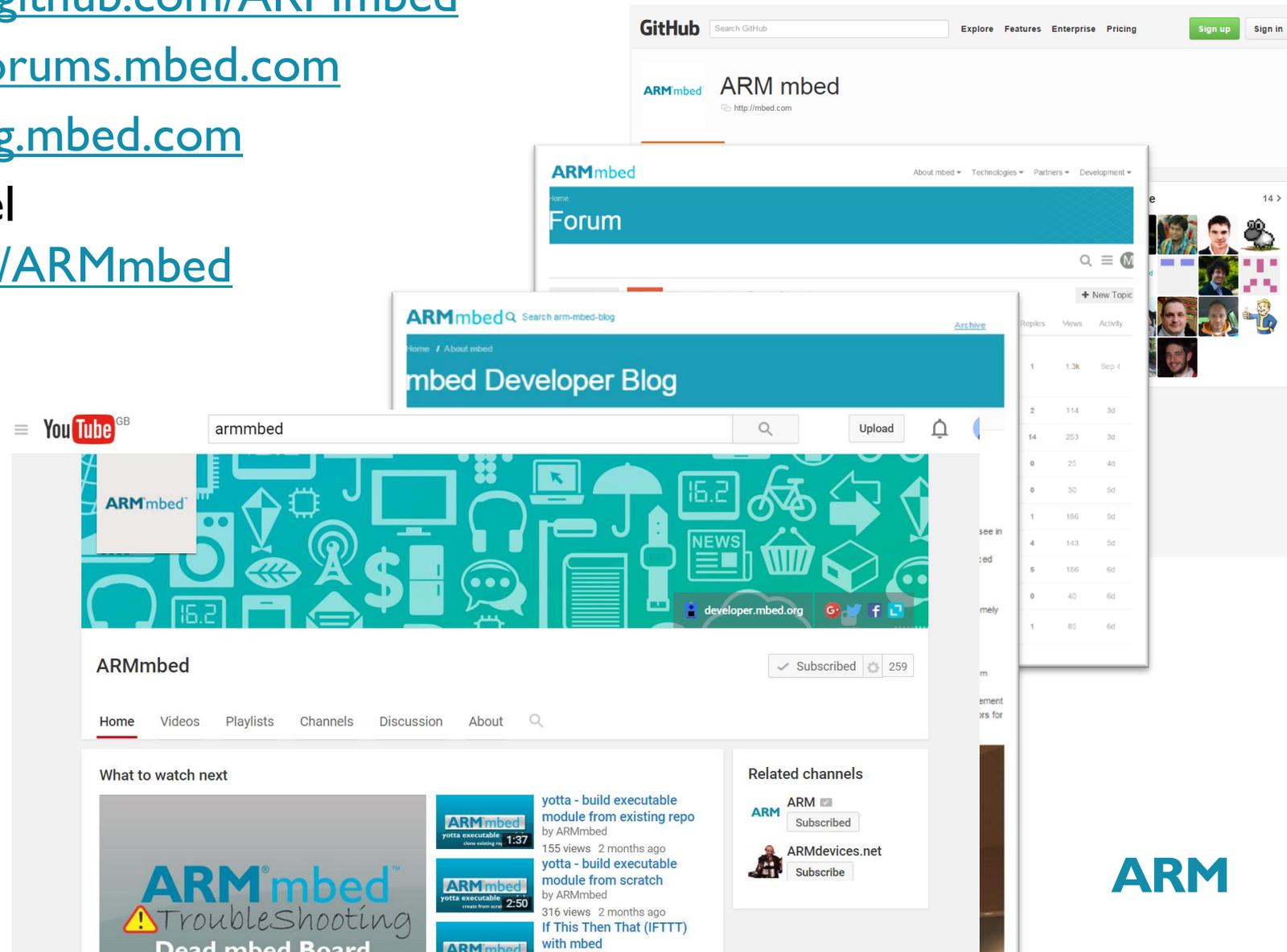
The screenshot shows the ARM mbed website interface. At the top left is the ARM mbed logo. To its right are links for 'Developer Resources' and 'Partners'. Below the logo is a dark teal navigation bar containing 'Platform', 'Technologies', 'Partners', 'About Us', and 'English' with a globe icon. Underneath the navigation bar is a teal banner with the text 'Home / About Us' and a large white heading 'ARM mbed Enabled'. Below the banner is a white section with the following text: 'The program aims to validate a product's compliance with the requirements of the ARM® mbed Enabled™ Program. Validation ensures that a product conforms to the mbed's compliance criteria and technical requirements and maintains interoperability with other mbed Enabled products.'

# Timeline Expectations



# Other useful resources

- ARM mbed GitHub: <https://github.com/ARMmbed>
- ARM mbed forums: <http://forums.mbed.com>
- ARM mbed blogs: <http://blog.mbed.com>
- ARM mbed YouTube channel  
<https://www.youtube.com/c/ARMmbed>



# Questions / Feedback

# ARM

# Thank You!

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