Intel

Software

IMPLEMENTING MICROPYTHON AS AN UNIFIED EXTENSIBLE FIRMWARE INTERFACE (UEFI) TEST FRAMEWORK

Brian Richardson & Stephano Cetola – Intel Corporation

OSFC 2018 – osfc.io

Implementing MicroPython in UEFI

MicroPython is a Python* 3 variant with memory & size optimizations for microcontrollers

This session describes the implementation of a test framework based on a port of MicroPython for UEFI

This Photo by Unknown Author is licensed under CC BY-SA

intel
Software

Why go Micro(Python)?

CPython* has been ported to UEFI, but not widely used…

- Poor performance & large footprint

- No direct access to firmware/hardware resources

- Limited usage with UEFI Shell dependencies

MicroPython is a lean and efficient implementation of Python 3 for constrained environments

Features of MicroPython on UEFI

Provides scripts with access to resources:

- UEFI & EFI Development Kit II (EDK II) interfaces

- Hardware-level access

- Interpreter and Native Interface

- Automates human interaction (shell & setup menu)

Note: There are small differences between MicroPython and Python 3 language behavior (documented on website)

Use Cases for MicroPython in UEFI

Replacing DOS/Legacy Applications

Diagnostics & Manufacturing Testing

Rapid Development of UEFI Applications

Support for UEFI CPython scripts after conversion to 3.x
(Python 2.7 expected to EOL in 2020)

MicroPython Test Framework for UEFI

Released to edk2-staging branch in August 2018

https://github.com/tianocore/edk2-staging/tree/MicroPythonTestFramework

- **MicroPythonPkg** - MicroPython Interpreter for UEFI

- **MpyTestFrameworkPkg** - MicroPython Test Framework for UEFI

- **MpyTestCasePkg** - Repo for test cases (placeholder)

```
$ git clone https://github.com/tianocore/edk2-staging
$ cd edk2-staging
$ git checkout MicroPythonTestFramework
$ git submodule update --init –recursive
```

Current Status & Future Work

Code is in staging branch for community evaluation

Next Steps:

- Create Branches for MicroPython Engine and Framework
  - Engine will keep MIT License, contribute back to micropython.org
  - Test Framework will move to master branch (BSD license)

- Optimize and Extend MicroPython Engine
  - Increase the number of default libraries and reference scripts
  - Remove dependency on StdLib (reduce size)

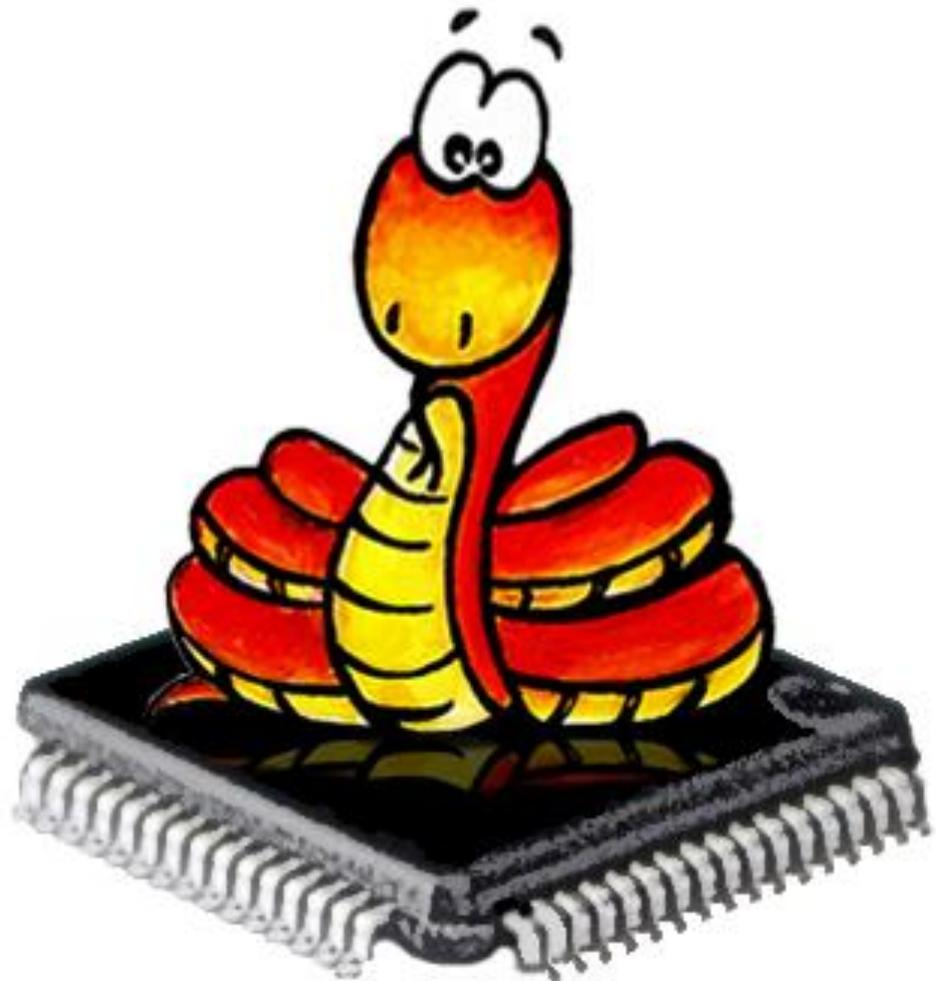# We Need Your Input!

Check out our demos

Please evaluate `MicroPythonPkg` & `MpyTestFrameworkPkg`

Provide feedback on the code under `edk2-staging`

- Quality issues?

- Feature requests?

More Info: [TianoCore Wiki](https://github.com/tianocore/tianocore.github.io/wiki/MicroPython-Test-Framework-for-UEFI)
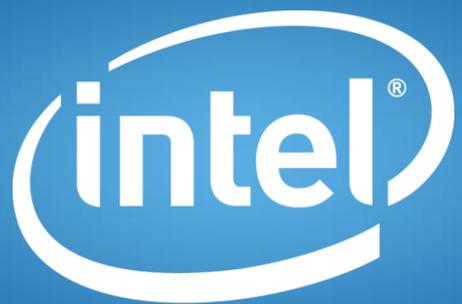https://github.com/tianocore/tianocore.github.io/wiki/MicroPython-Test-Framework-for-UEFI

Legal Notice

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

Intel, the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others

© Intel Corporation.