



UEFI & EDK II Training

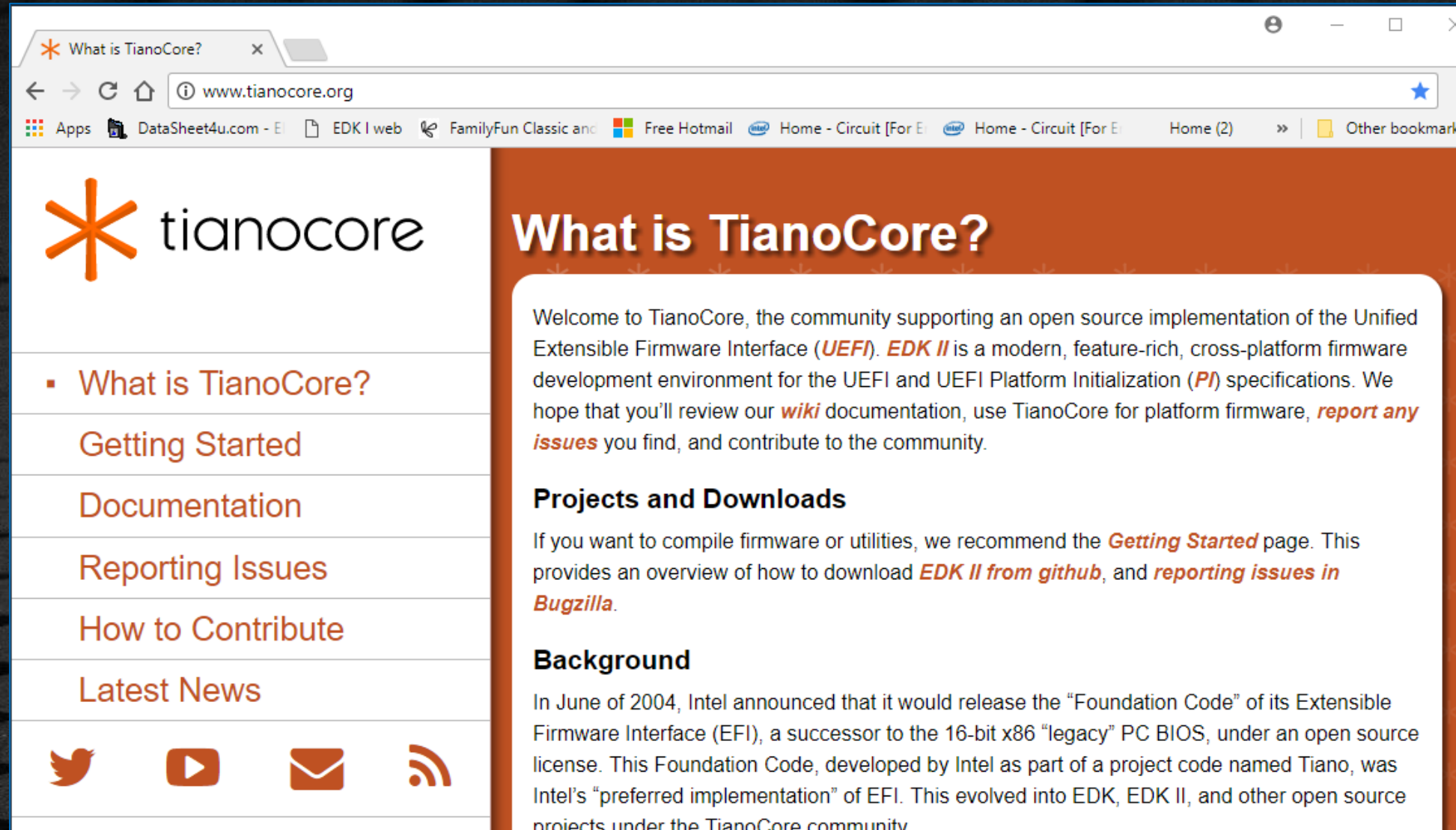
Open Source UEFI Platforms

tianocore.org

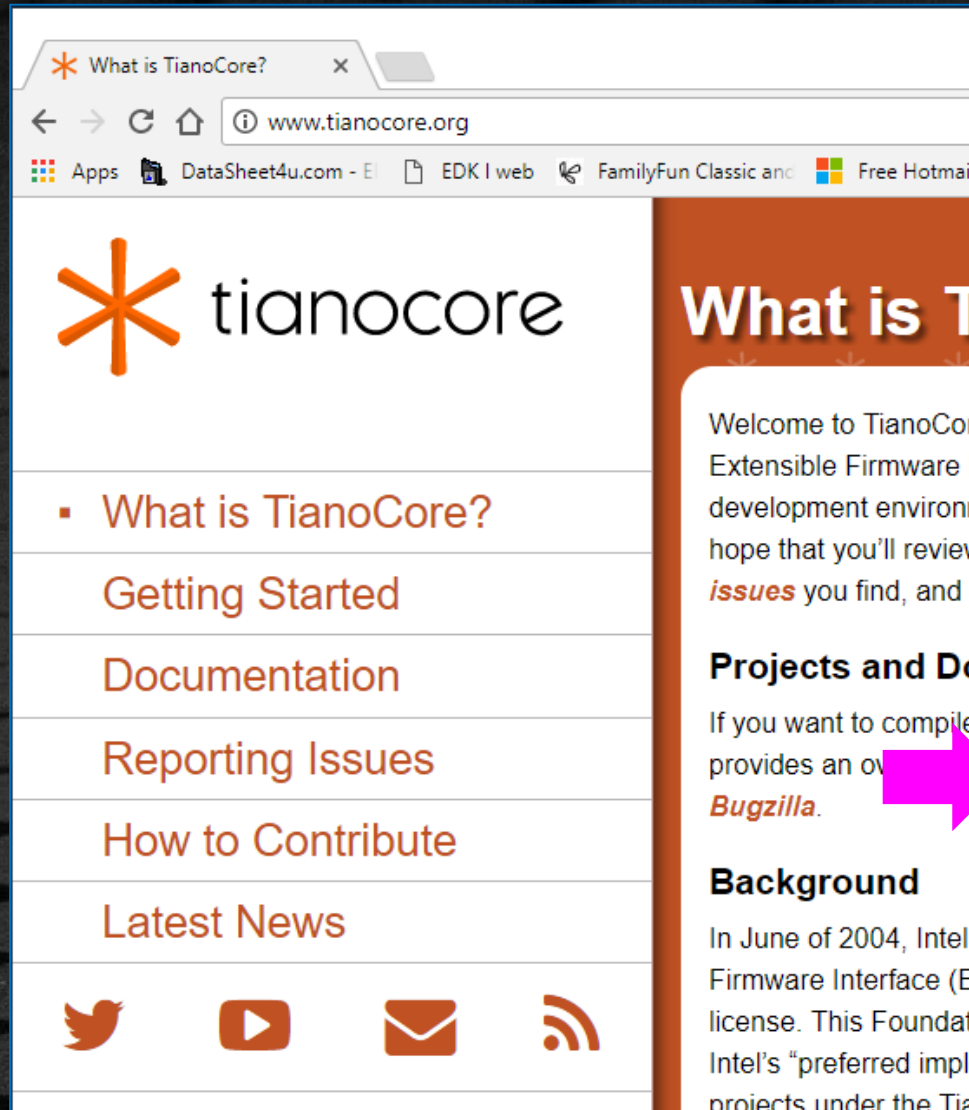


LESSON OBJECTIVE

-  Chart the organization of the Tianocore.org repositories
-  Recognize the various Open Source UEFI Platforms



Platforms [NT32](#), [OVMF](#), [ArmVirt](#), [MdePkg](#) **Hardware platforms:** [MinnowBoard Max/Turbot](#), [MinnowBoard 3](#), and [Intel® Galileo Gen 2](#).



What is TianoCore?

Getting Started

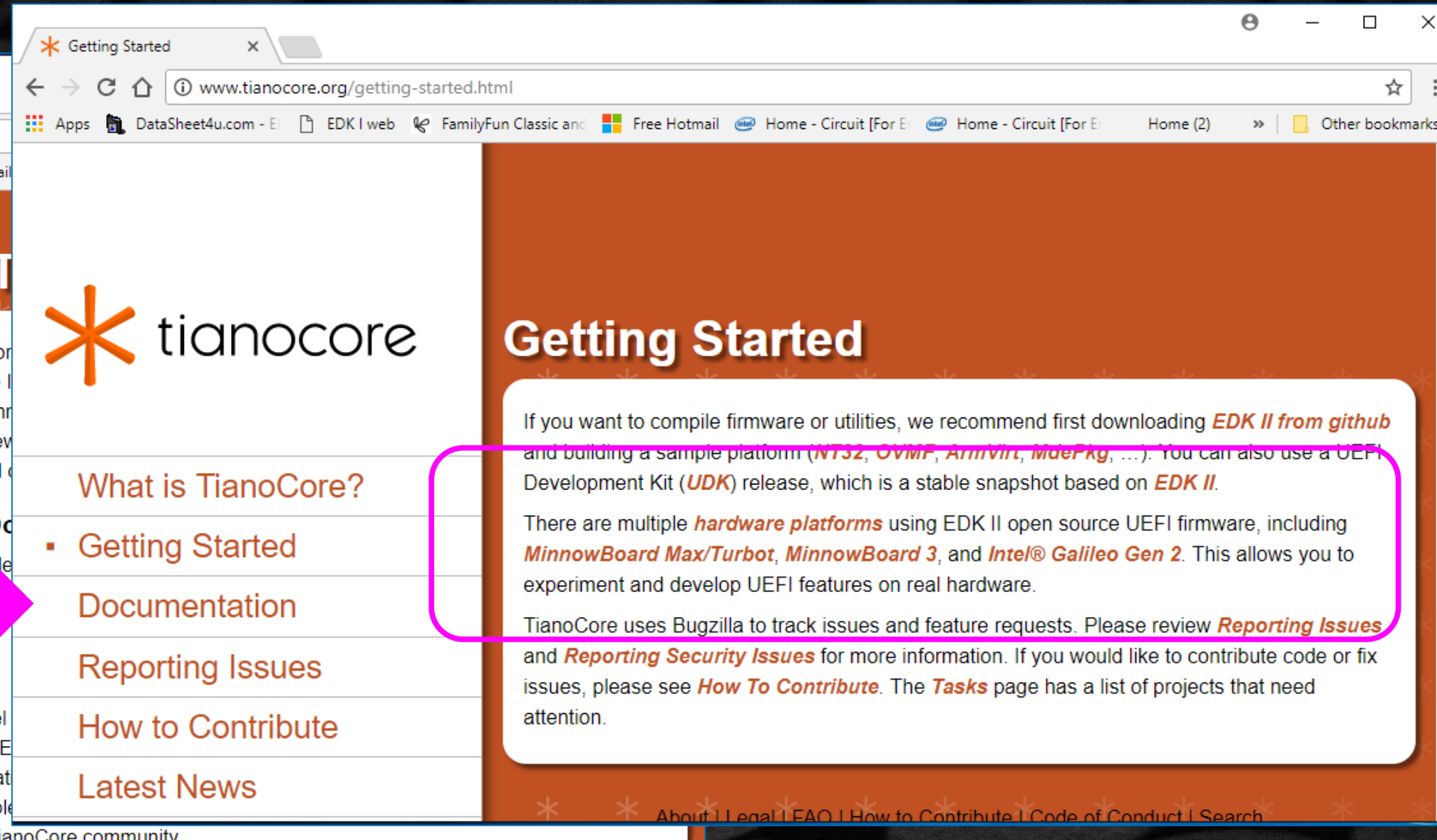
Documentation

Reporting Issues

How to Contribute

Latest News

Twitter YouTube Email RSS



Getting Started

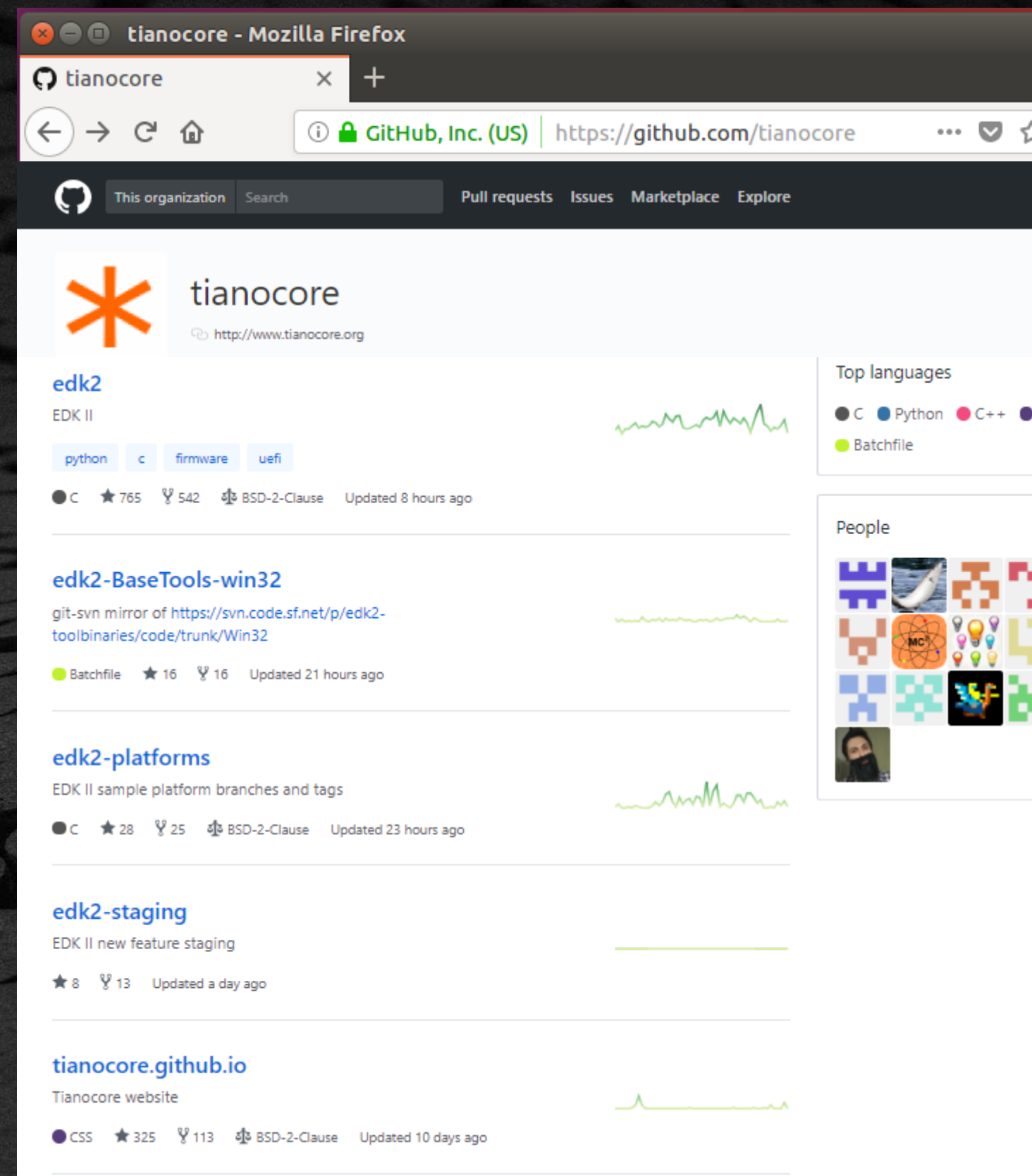
If you want to compile firmware or utilities, we recommend first downloading **EDK II from github** and building a sample platform (**NT32, OVMF, ArmVirt, MdePkg, ...**). You can also use a UEFI Development Kit (**UDK**) release, which is a stable snapshot based on **EDK II**.

There are multiple **hardware platforms** using EDK II open source UEFI firmware, including **MinnowBoard Max/Turbot, MinnowBoard 3, and Intel® Galileo Gen 2**. This allows you to experiment and develop UEFI features on real hardware.

TianoCore uses Bugzilla to track issues and feature requests. Please review **Reporting Issues** and **Reporting Security Issues** for more information. If you would like to contribute code or fix issues, please see **How To Contribute**. The **Tasks** page has a list of projects that need attention.

Platforms [NT32](#), [OVMF](#), [ArmVirt](#), [MdePkg](#) [Hardware platforms](#): [MinnowBoard Max/Turbot](#), [MinnowBoard 3](#), and [Intel® Galileo Gen 2](#).

Concept of Repositories



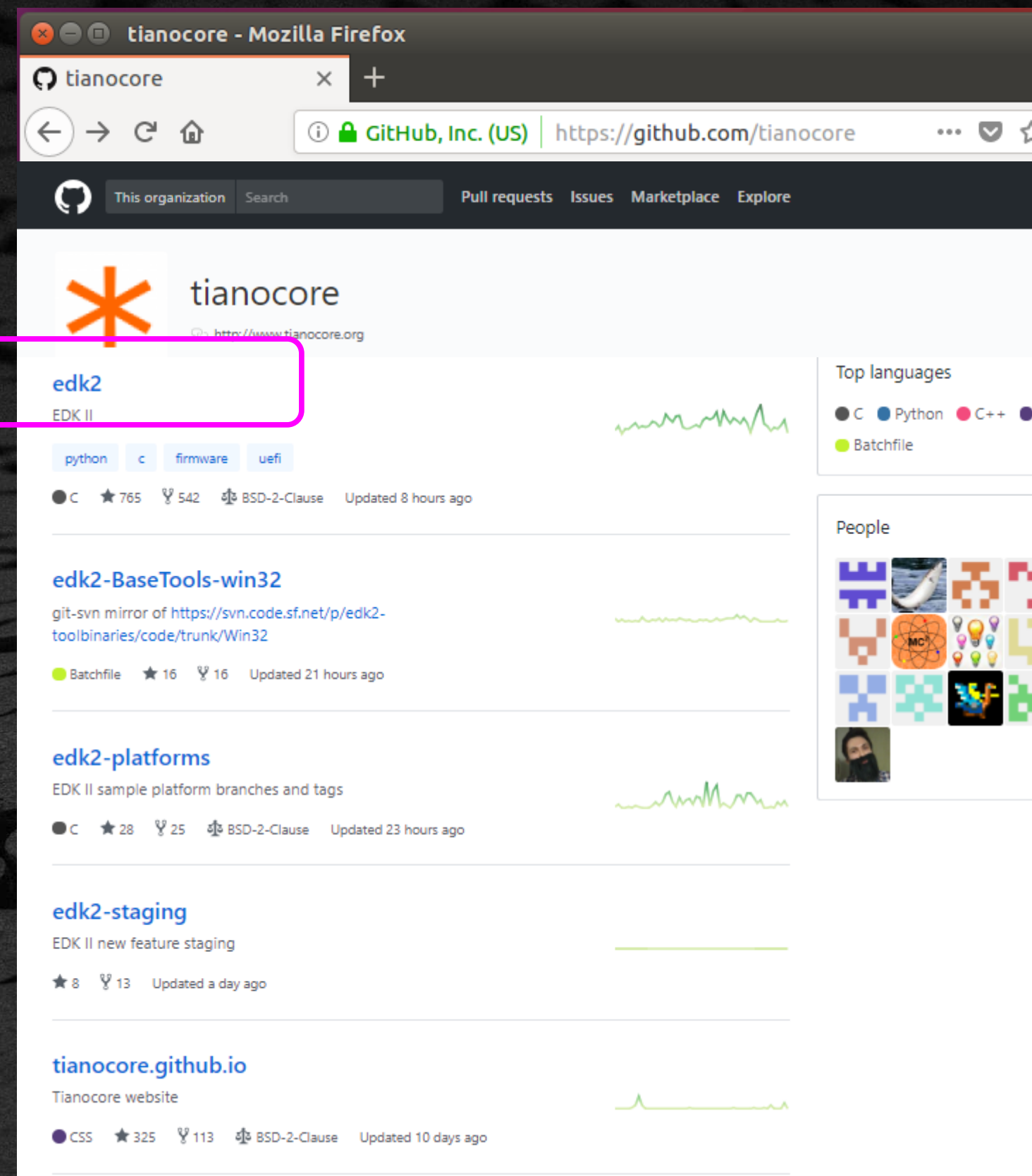
The screenshot shows the GitHub organization page for tianocore. The browser window is titled "tianocore - Mozilla Firefox" and the address bar shows "https://github.com/tianocore". The organization's profile includes the tianocore logo and website URL "http://www.tianocore.org". The main content area lists several repositories:

- edk2**: EDK II. Languages: python, c, firmware, uefi. 765 stars, 542 forks, BSD-2-Clause license. Updated 8 hours ago.
- edk2-BaseTools-win32**: git-svn mirror of https://svn.code.sf.net/p/edk2-toolbinaries/code/trunk/Win32. Language: Batchfile. 16 stars, 16 forks. Updated 21 hours ago.
- edk2-platforms**: EDK II sample platform branches and tags. 28 stars, 25 forks, BSD-2-Clause license. Updated 23 hours ago.
- edk2-staging**: EDK II new feature staging. 8 stars, 13 forks. Updated a day ago.
- tianocore.github.io**: Tianocore website. Language: CSS. 325 stars, 113 forks, BSD-2-Clause license. Updated 10 days ago.

On the right side, there are sections for "Top languages" (C, Python, C++, Batchfile) and "People" (a grid of user avatars).

Concept of Repositories

- Main development - **edk2**




The screenshot shows the GitHub organization page for tianocore. The organization's name and logo are at the top. Below, a list of repositories is displayed. The repository 'edk2' is highlighted with a pink box. It is described as 'EDK II' and has tabs for 'python', 'c', 'firmware', and 'uefi'. Other repositories listed include 'edk2-BaseTools-win32', 'edk2-platforms', 'edk2-staging', and 'tianocore.github.io'. The right sidebar shows 'Top languages' (C, Python, C++, Batchfile) and 'People'.

tianocore - Mozilla Firefox

tianocore

GitHub, Inc. (US) | https://github.com/tianocore

This organization Search Pull requests Issues Marketplace Explore

 tianocore
http://www.tianocore.org

edk2
EDK II

python c firmware uefi

C ★ 765 🍴 542 📄 BSD-2-Clause Updated 8 hours ago

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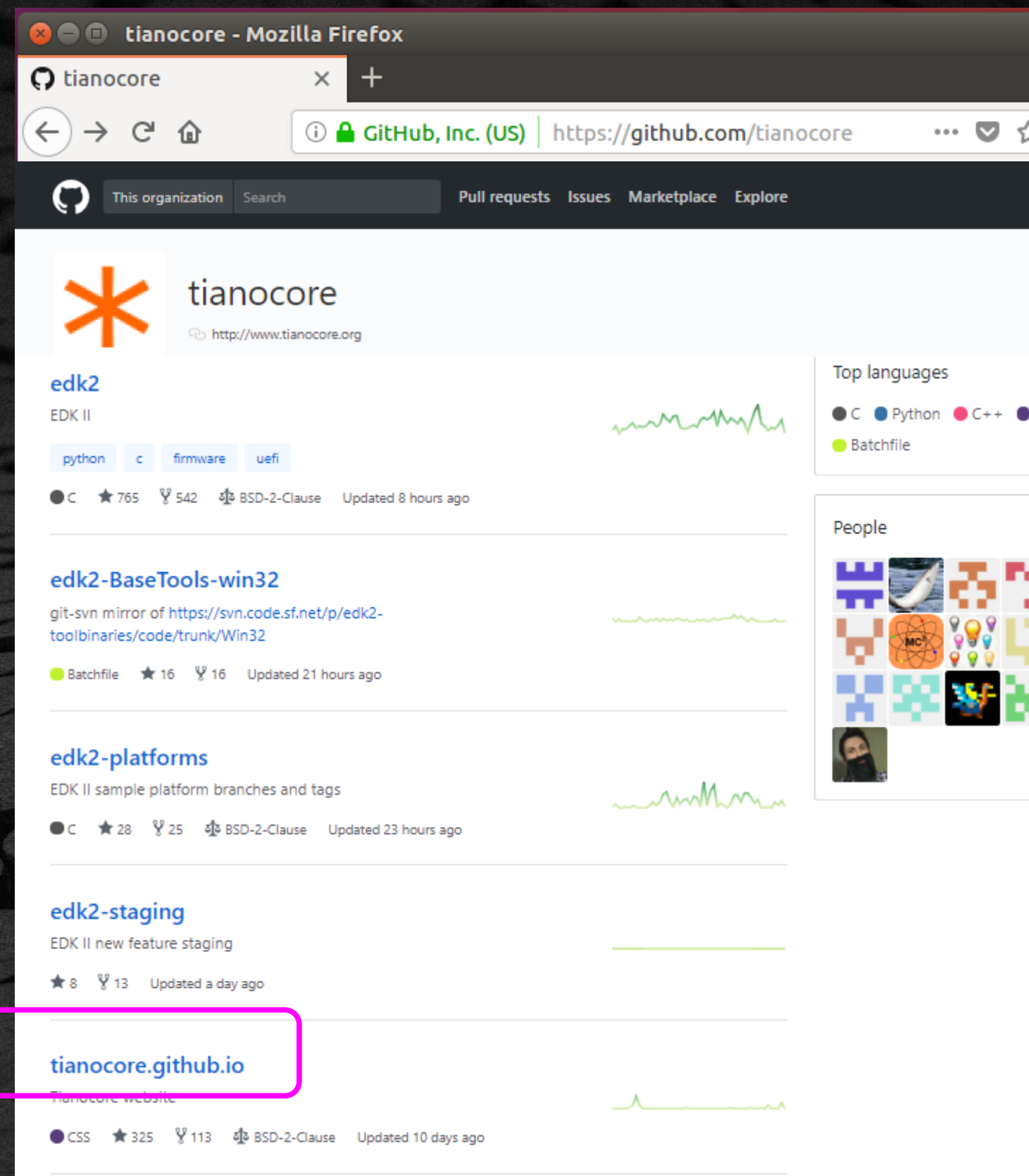
Top languages

C Python C++ Batchfile

People

Concept of Repositories

- Main development - **edk2**
- Online Info and Help (Wiki pages) - **tianocore.github.io**




tianocore - Mozilla Firefox

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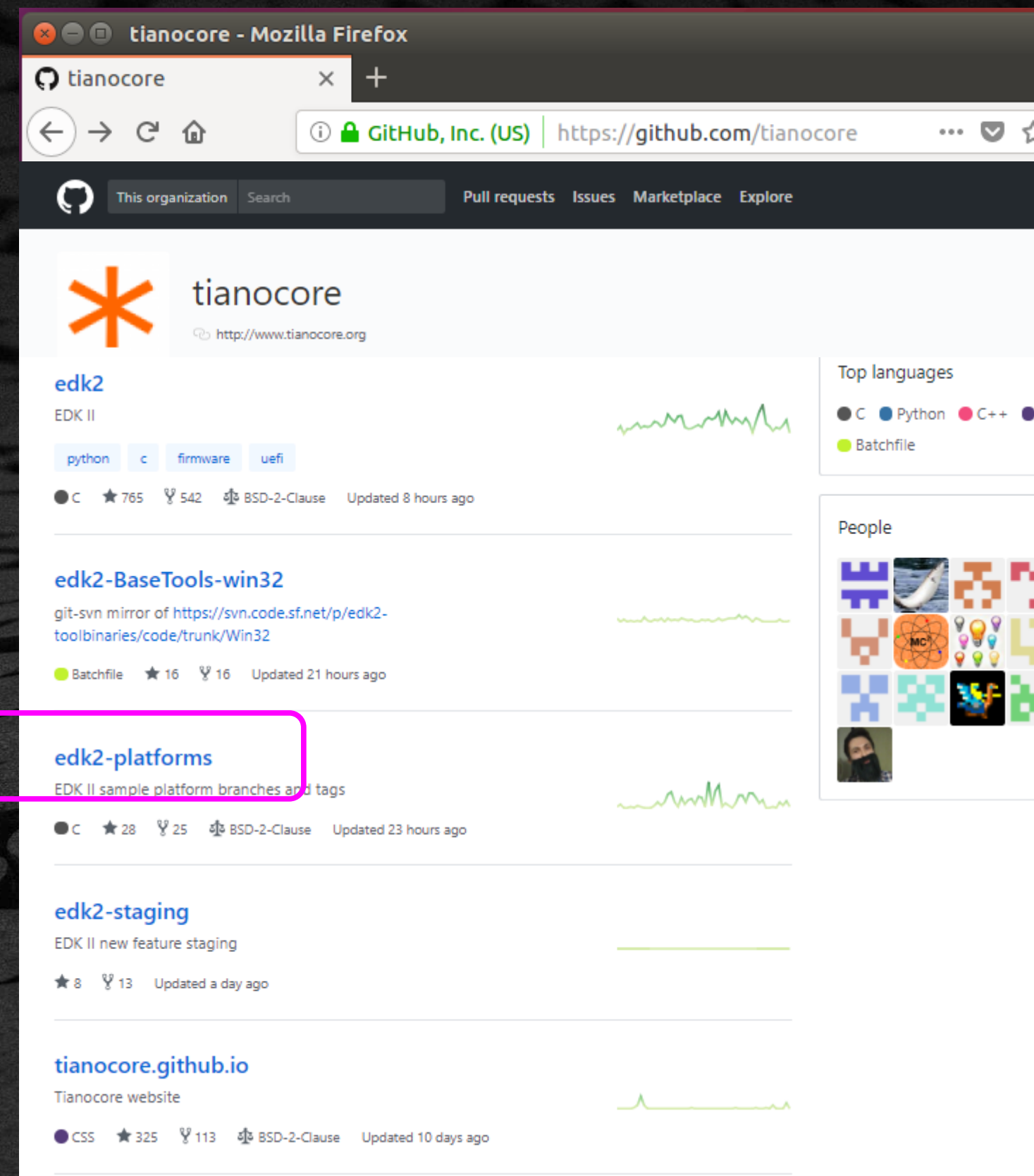
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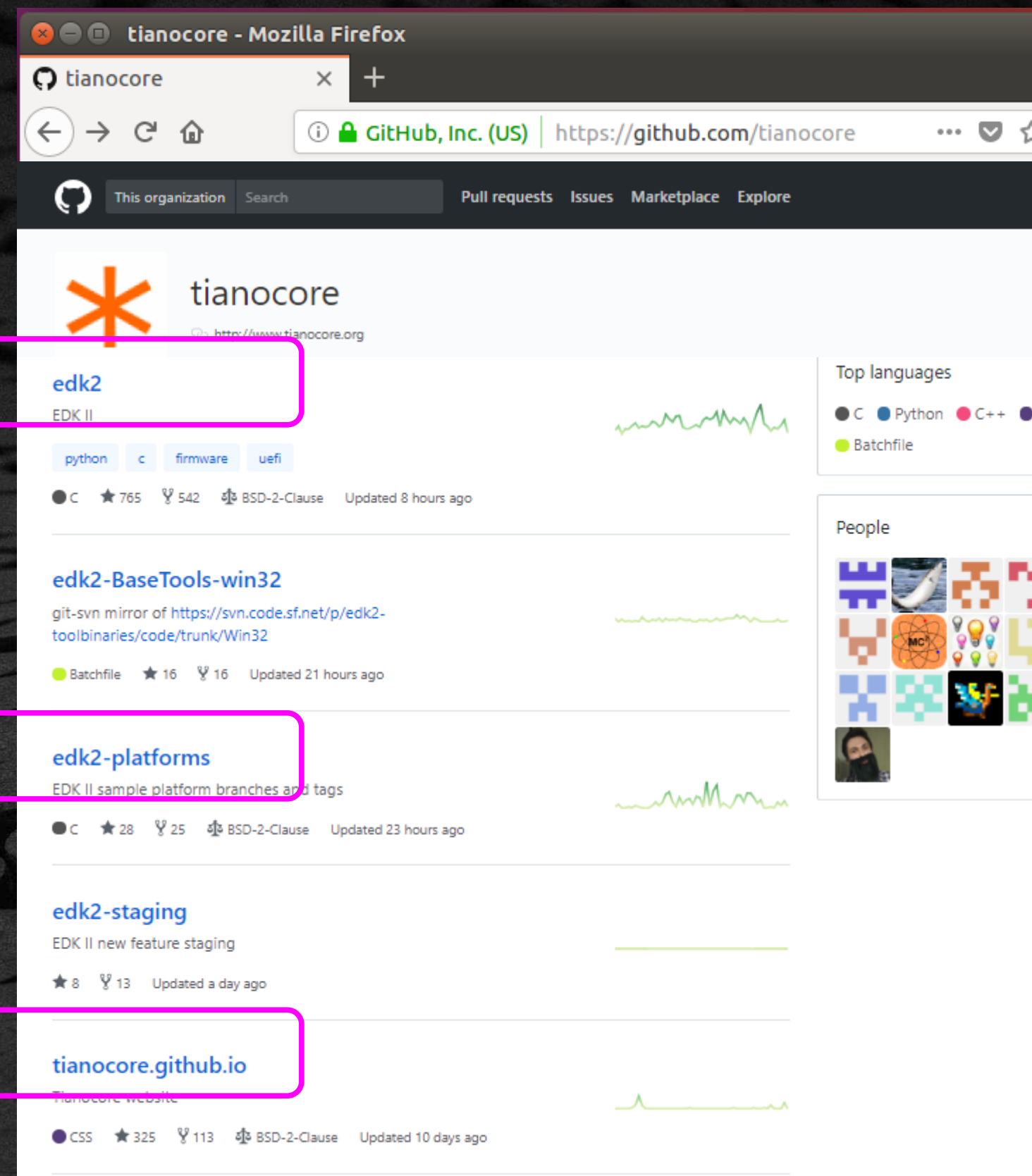
Concept of Repositories

- Main development - **edk2**
- Online Info and Help (Wiki pages) - **tianocore.github.io**
- Other platforms - **edk2-platforms**



Concept of Repositories

- Main development - **edk2**
- Online Info and Help (Wiki pages) - **tianocore.github.io**
- Other platforms - **edk2-platforms**
- To download use “**git clone**” then “**git checkout**”



GitHub Tianocore.org

edk2 – Platforms on edk2- “CORE”

BeagleBoardPkg

Coreboot...Pkg

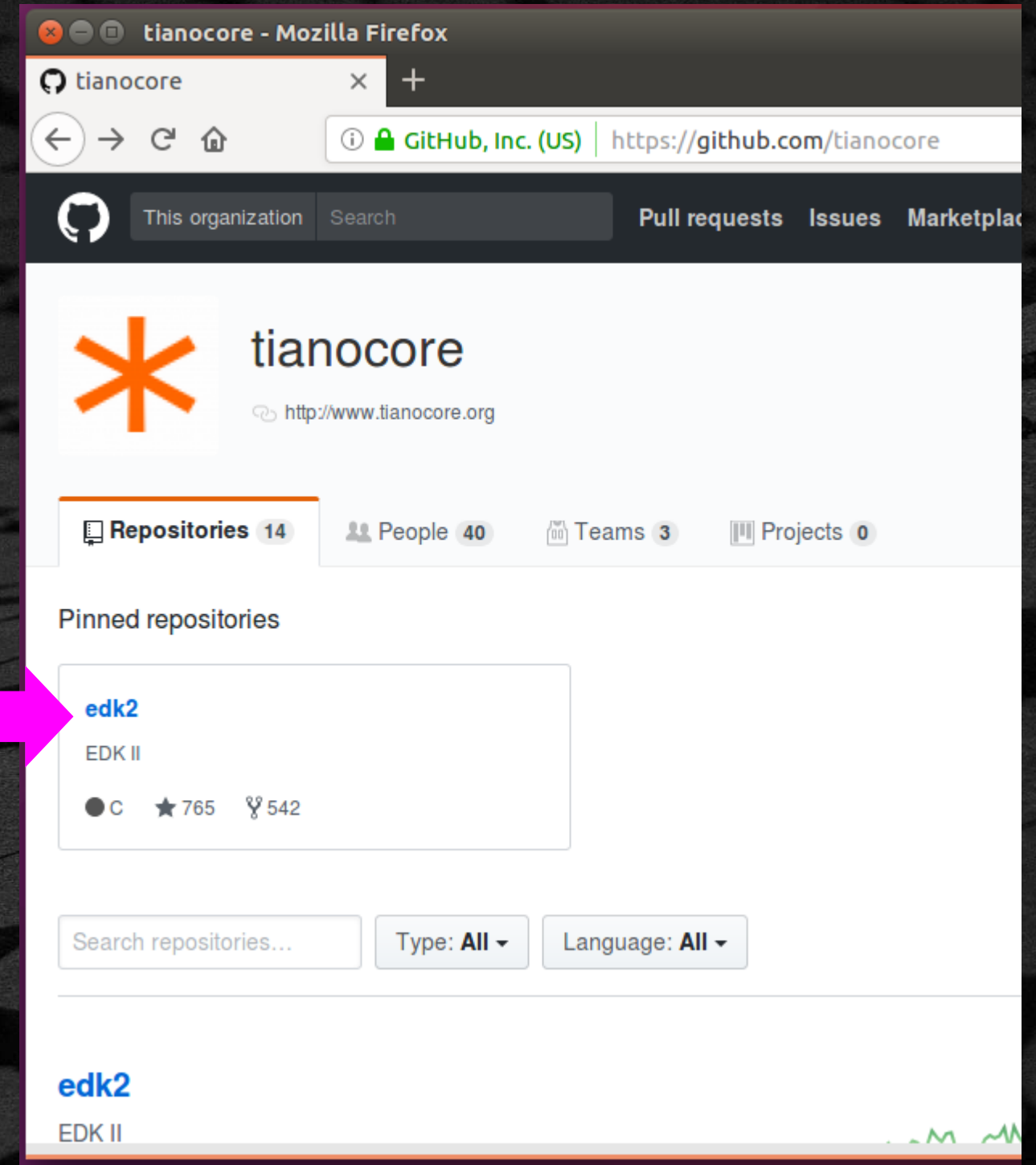
DuetPkg

Nt32Pkg

OvmfPkg

QuarkPlatformPkg

See *Readme.md* files



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edk2 – Platforms on edk2- “CORE”

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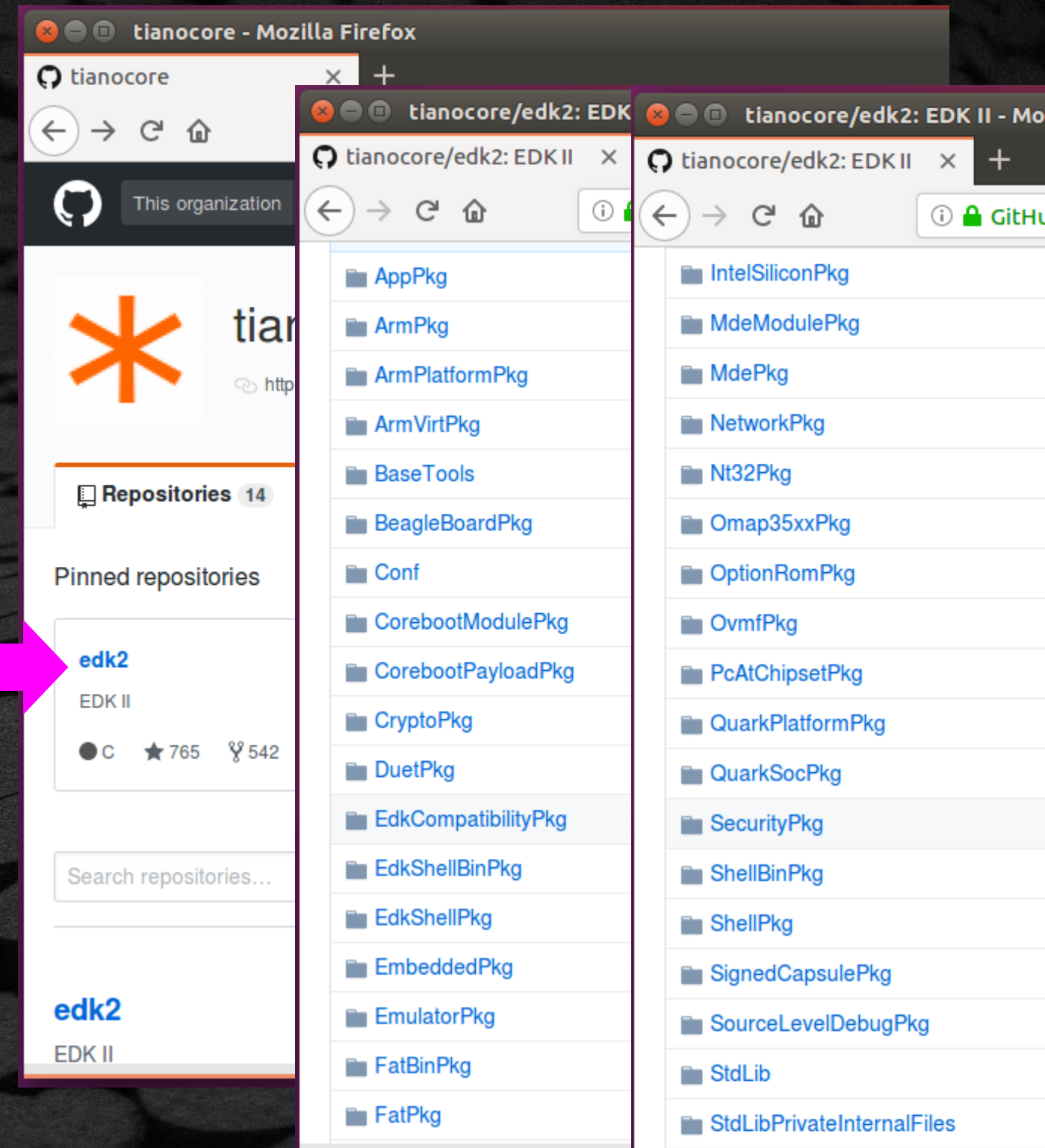
DuetPkg

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edk2 – Platforms on edk2- “CORE”

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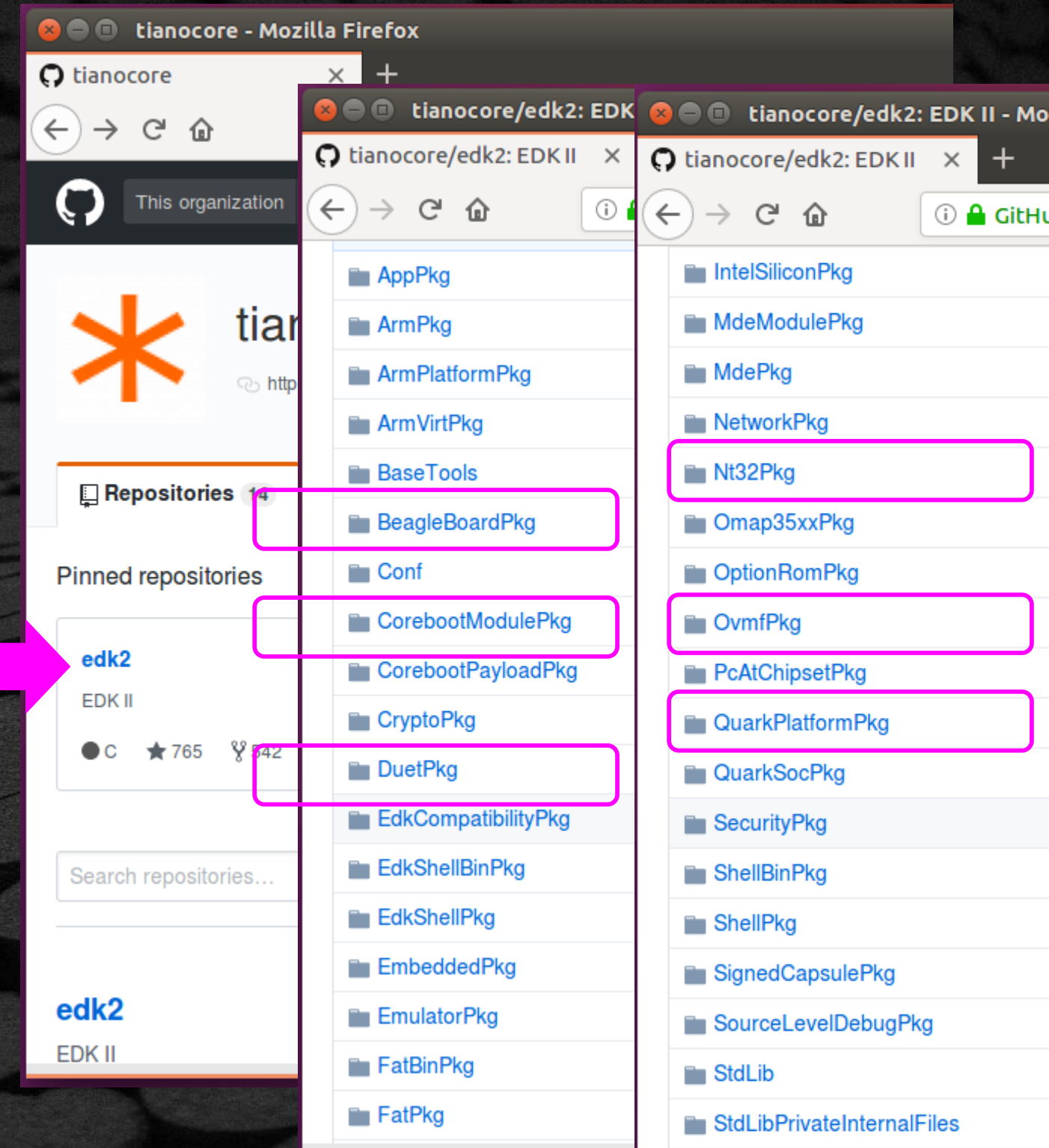
DuetPkg

Nt32Pkg

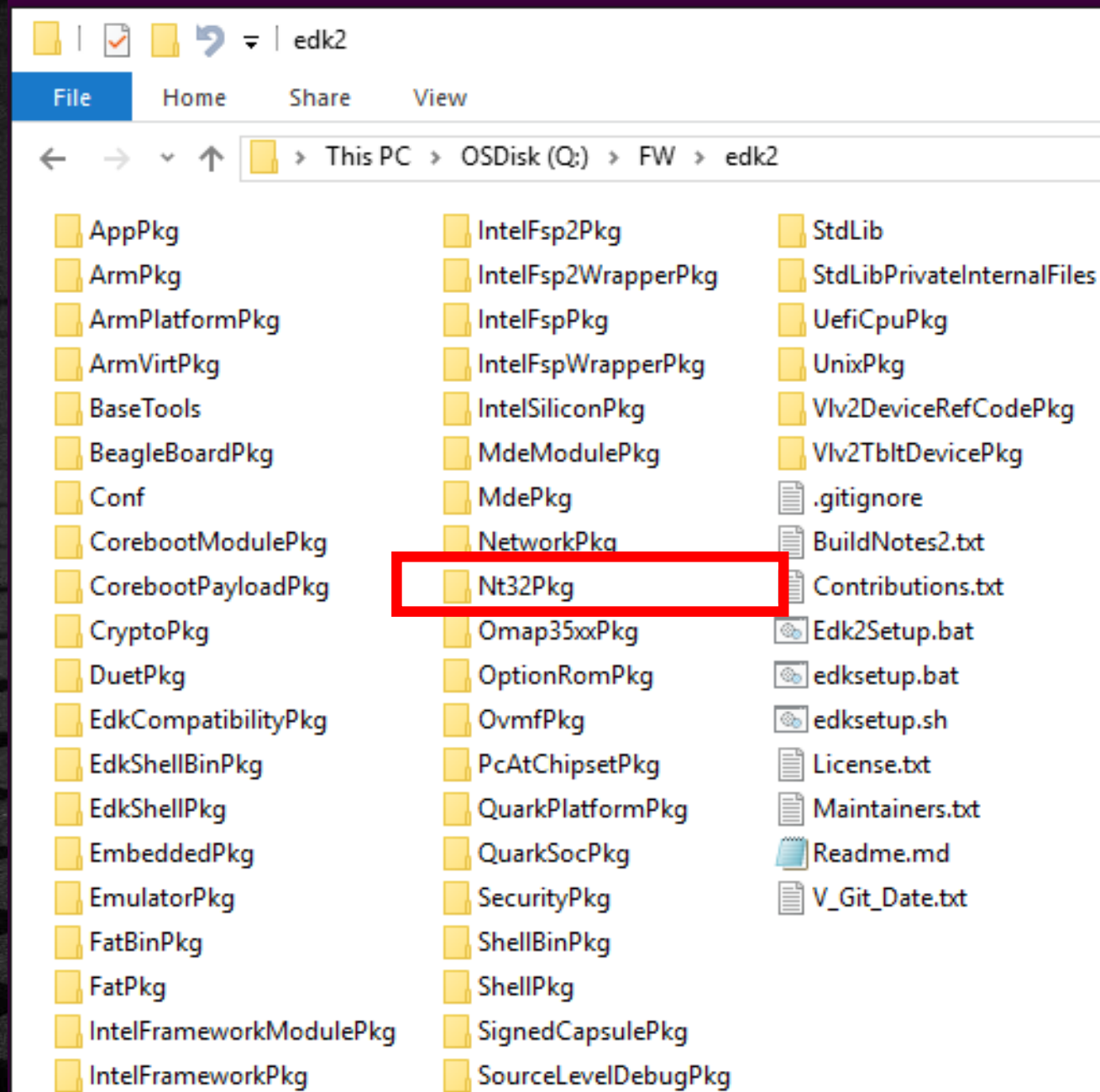
OvmfPkg

QuarkPlatformPkg

See *Readme.md* files



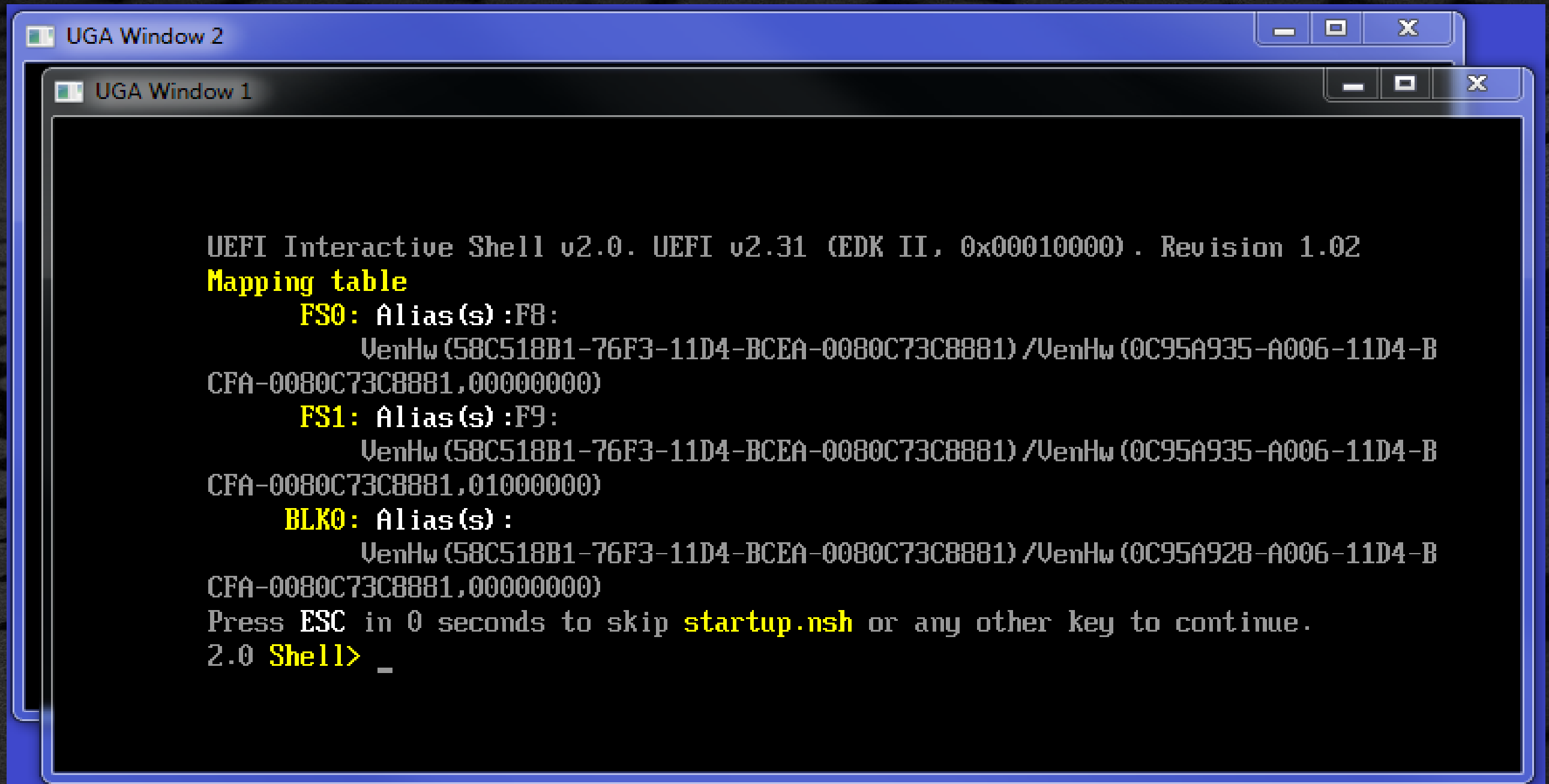
NT32 EMULATION DIRECTORY STRUCTURE



Nt32Pkg files

- ✓ Nt32Pkg.dsc
- ✓ Nt32Pkg.dec
- ✓ Nt32Pkg.fdf

Running NT32 Emulation with Windows

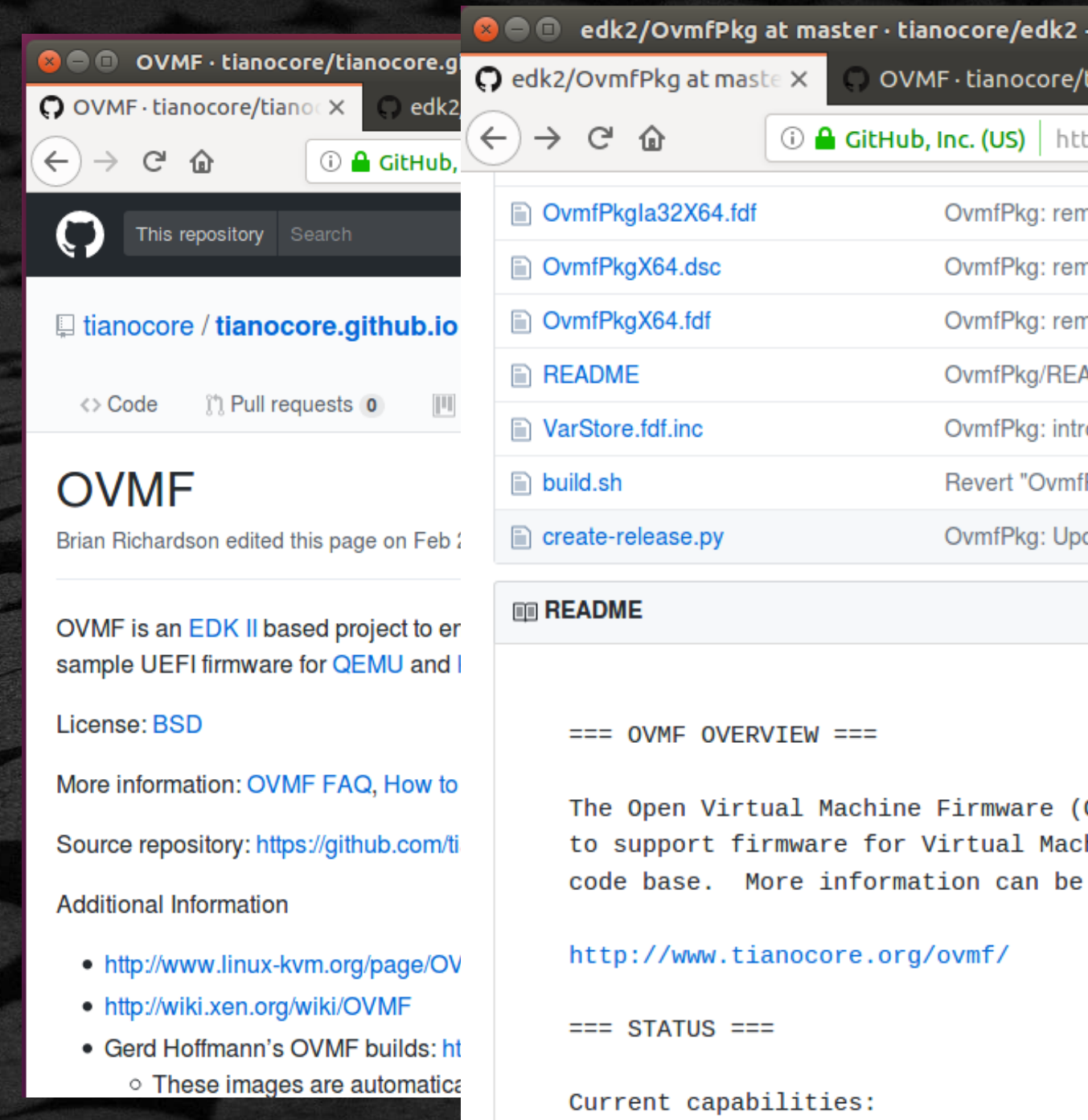


The screenshot shows a UEFI Interactive Shell v2.0 window titled "UGA Window 2". Inside, there is a sub-window titled "UGA Window 1" which displays the following text:

```
UEFI Interactive Shell v2.0. UEFI v2.31 (EDK II, 0x00010000) . Revision 1.02
Mapping table
  FS0: Alias(s):F8:
        VenHw (58C518B1-76F3-11D4-BCEA-0080C73C8881)/VenHw (0C95A935-A006-11D4-B
CFA-0080C73C8881,00000000)
  FS1: Alias(s):F9:
        VenHw (58C518B1-76F3-11D4-BCEA-0080C73C8881)/VenHw (0C95A935-A006-11D4-B
CFA-0080C73C8881,01000000)
  BLK0: Alias(s):
        VenHw (58C518B1-76F3-11D4-BCEA-0080C73C8881)/VenHw (0C95A928-A006-11D4-B
CFA-0080C73C8881,00000000)
Press ESC in 0 seconds to skip startup.nsh or any other key to continue.
2.0 Shell> _
```

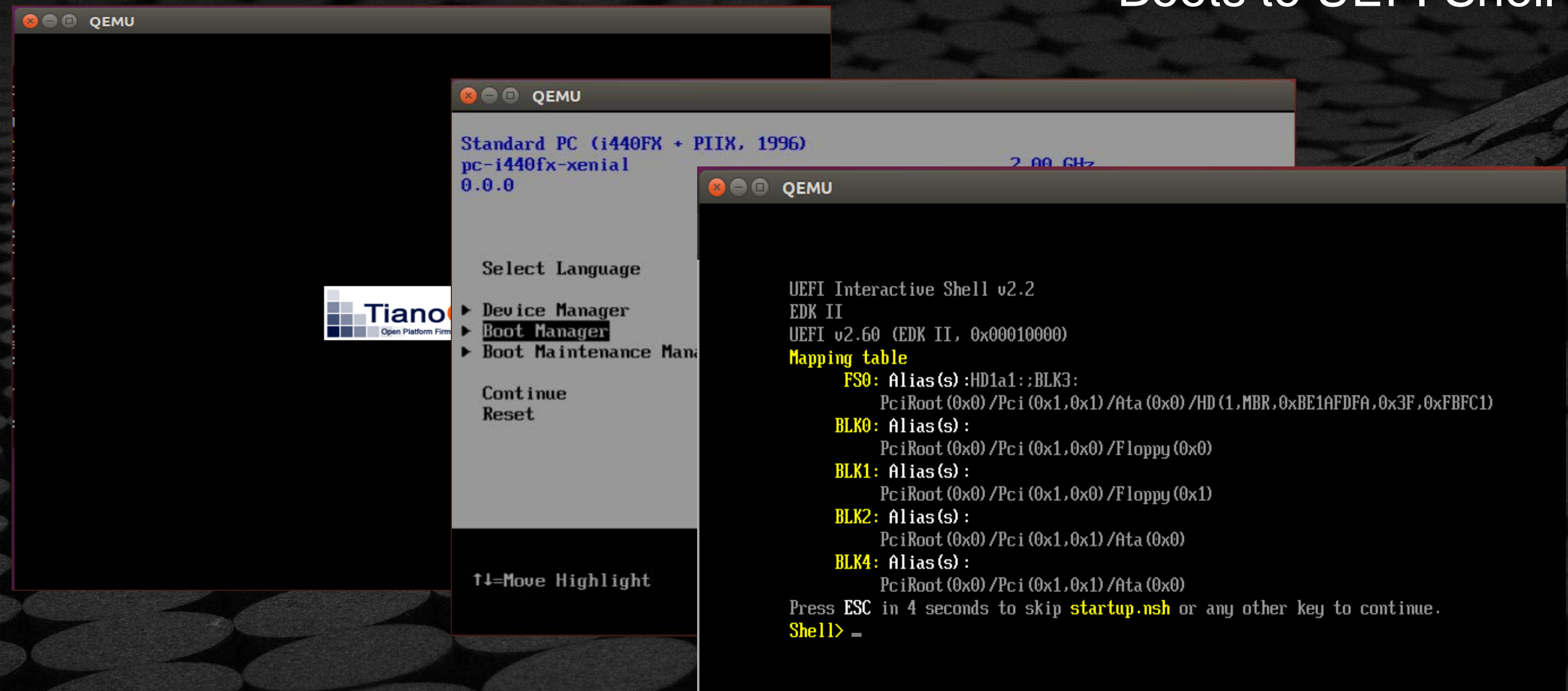

Open Virtual Machine Firmware (OVMF)

- Uses EDK II to support firmware in the OvmfPkg platform package
- Supports UEFI: Helps develop/debug drivers & applications
- QEMU VM; emulates IA32 (x86)/X64 (x86-64) based system
- Exit condition → UEFI Shell
- Tool Chain/OS Support
- Information [Ovmff wiki](https://www.tianocore.org/ovmf/), Tianocore.org



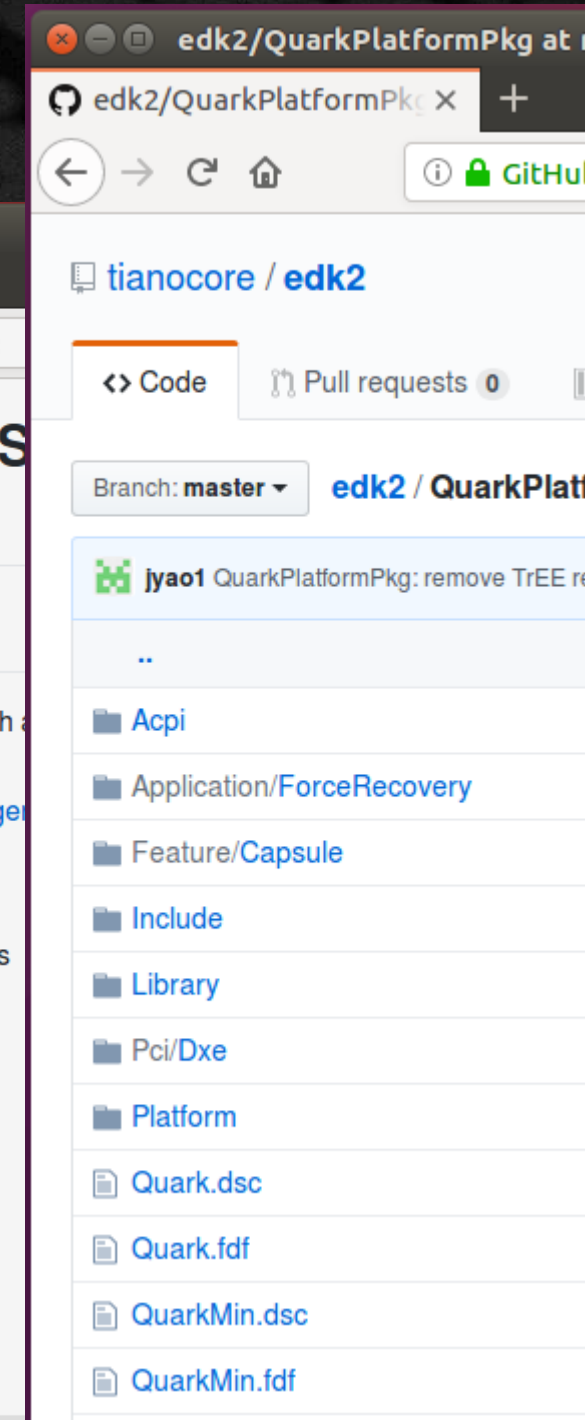
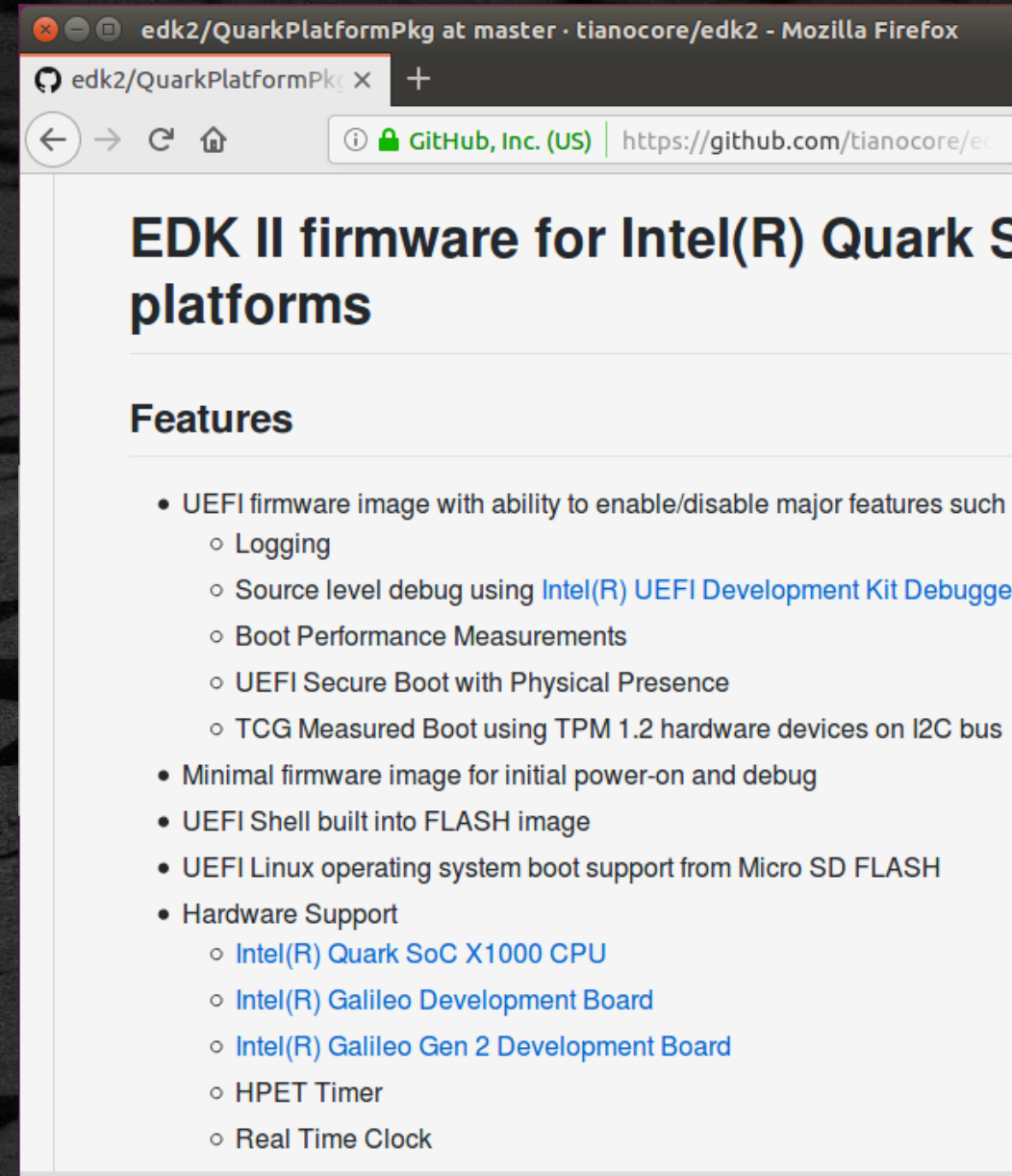
OVMF BIOS w/ QEMU

Boots to UEFI Shell



Intel® Quark SoC X1000 Platform Project EDK II

- Uses EDK II to support firmware
- QuarkPlatformPkg
-Intel® Galileo Gen2
- How to Build: [Quark Readme.md](#)



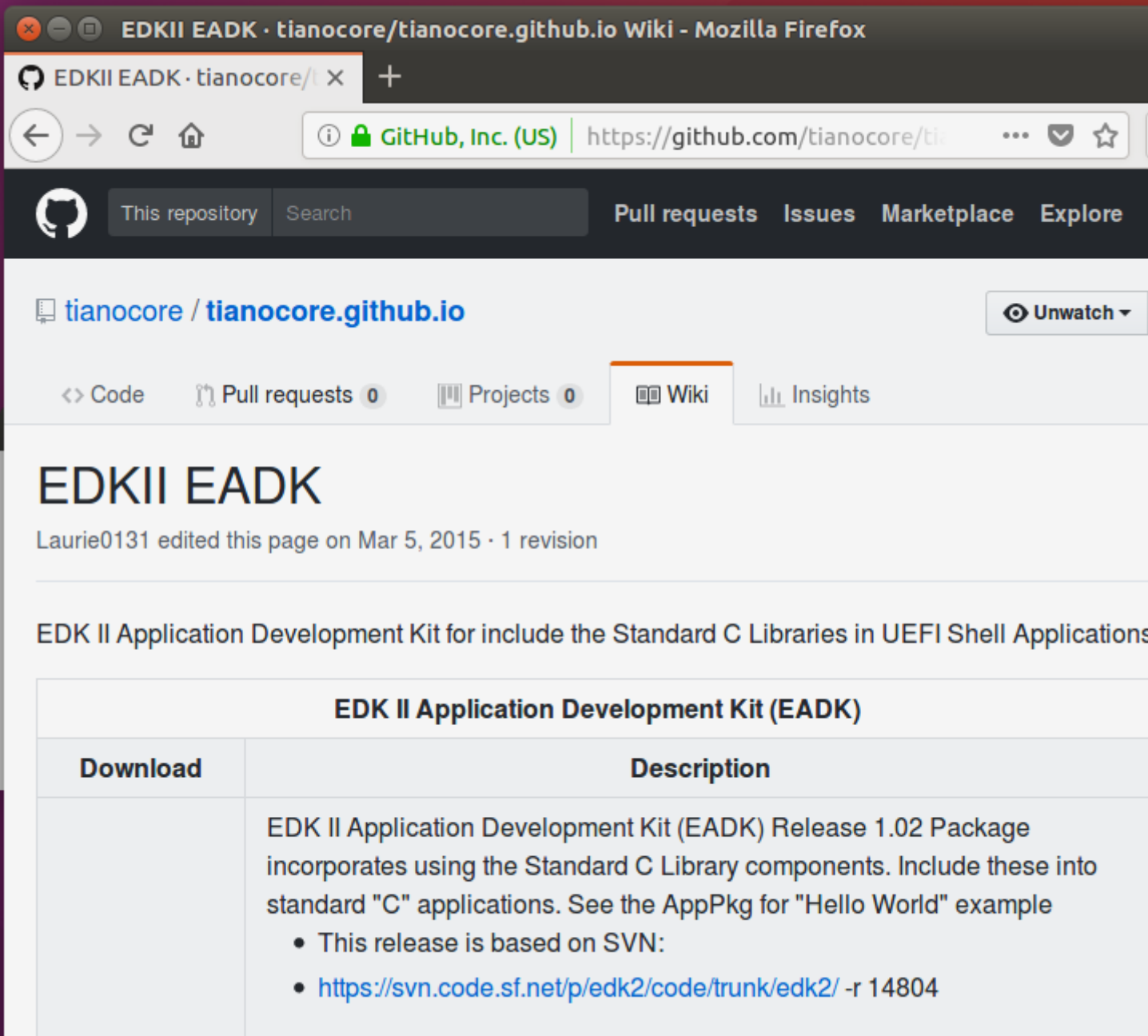
EDK II EADK

EDK II Application Development Kit includes the Standard “C” Libraries in UEFI Shell Applications

Link: [wiki EADK](#)

Github: [edk2/AppPkg](#)

Github: [edk2/StdLib](#)



The screenshot shows a Mozilla Firefox browser window displaying the GitHub Wiki page for 'EDKII EADK' by 'tianocore/tianocore.github.io'. The page title is 'EDKII EADK' and it notes that Laurie0131 edited this page on Mar 5, 2015, with 1 revision. The main content describes the 'EDK II Application Development Kit (EADK)' and includes a table with download links and descriptions.

EDK II Application Development Kit (EADK)	
Download	Description
	<p>EDK II Application Development Kit (EADK) Release 1.02 Package incorporates using the Standard C Library components. Include these into standard "C" applications. See the AppPkg for "Hello World" example</p> <ul style="list-style-type: none">• This release is based on SVN:• https://svn.code.sf.net/p/edk2/code/trunk/edk2/ -r 14804

EDK II EADK COMPONENTS

EDK II Application Development Kit includes the Standard C Libraries in UEFI Shell Applications

EDK II EADK COMPONENTS

EDK II Application Development Kit includes the Standard C Libraries in UEFI Shell Applications

Components

Utilities (Python 2.7.2, & 2.7.10 etc.)

C Library

BSD Socket Library

Network Socket Library – Ipv4 / Ipv6

EDK II EADK COMPONENTS

EDK II Application Development Kit includes the Standard C Libraries in UEFI Shell Applications

Components

Utilities (Python 2.7.2, & 2.7.10 etc.)

C Library

BSD Socket Library

Network Socket Library – Ipv4 / Ipv6

 Packages /**AppPkg**
/StdLib

EDK II EADK – STANDARD ANSI C LIBRARY

FreeBSD Port

ANSI/POSIX compliant

System I/O - open(), read(), write(), close(), stat()

Standard I/O - fopen(), printf(), gets(), ...

String/Char - strcmp(), isascii(), atoi(), ...

Memory - malloc(), free(), realloc(), ...

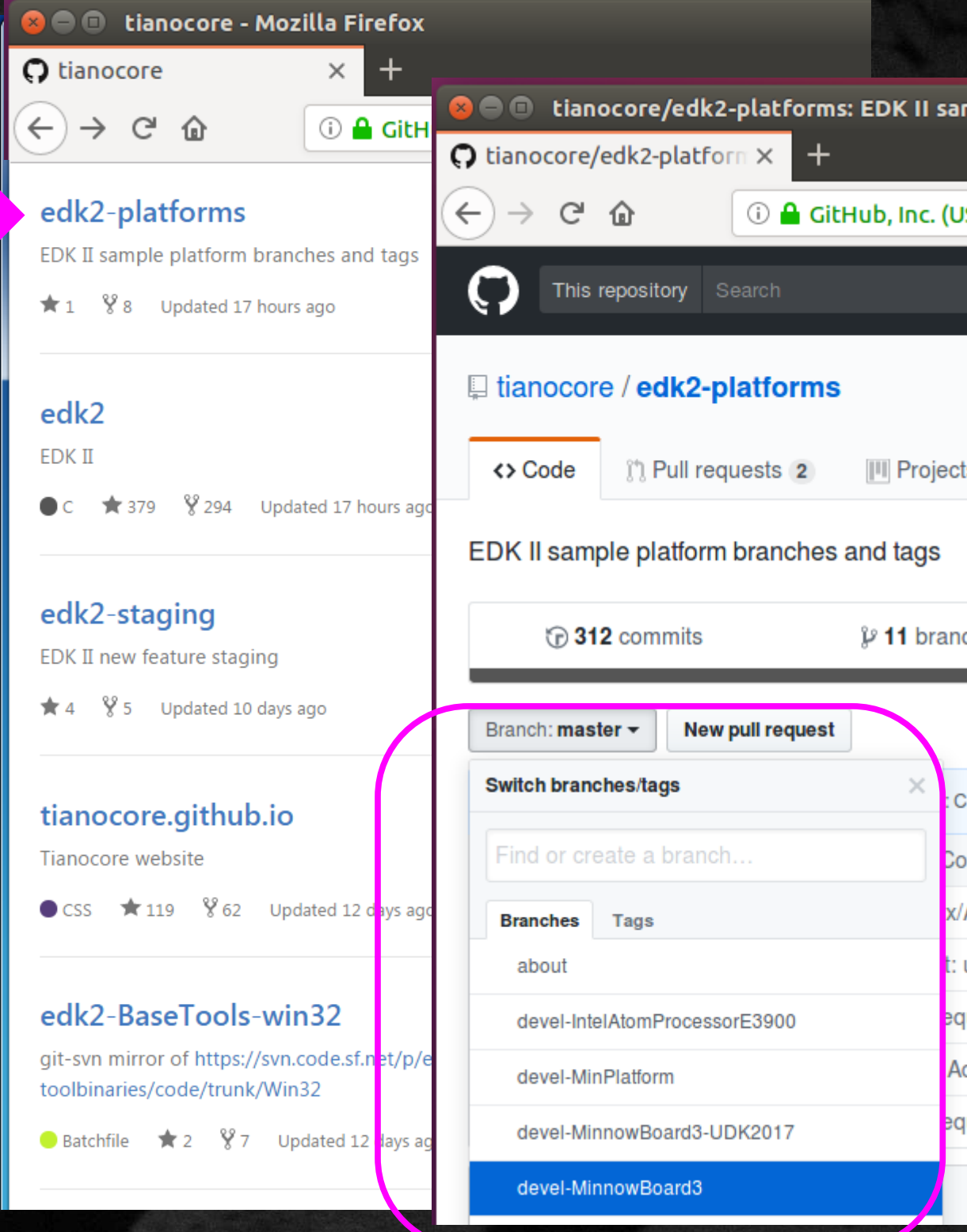
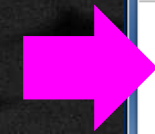
Time/Date - time(), asctime(), ctime(), ...

Math - sqrt(), pow(), sin(), log(), ...

PLATFORMS TIANOCORE.ORG

edk2-platforms – Platforms on branches

- devel-MinnowBoard3
– Leaf Hill (Broxton)
- devel-MinnowBoardMax-UDK2017
– BayTrail-I
- pentium-celeron-n-udk2015
- Cherry Hill (Braswell)
- How to build
See *Readme.md* files



The screenshot shows the GitHub repository page for `edk2-platforms` under the `tianocore` organization. The page displays the repository name, description, and a list of branches. A pink circle highlights the 'Switch branches/tags' dropdown menu, which is open, showing a list of branches including `devel-MinnowBoard3`.

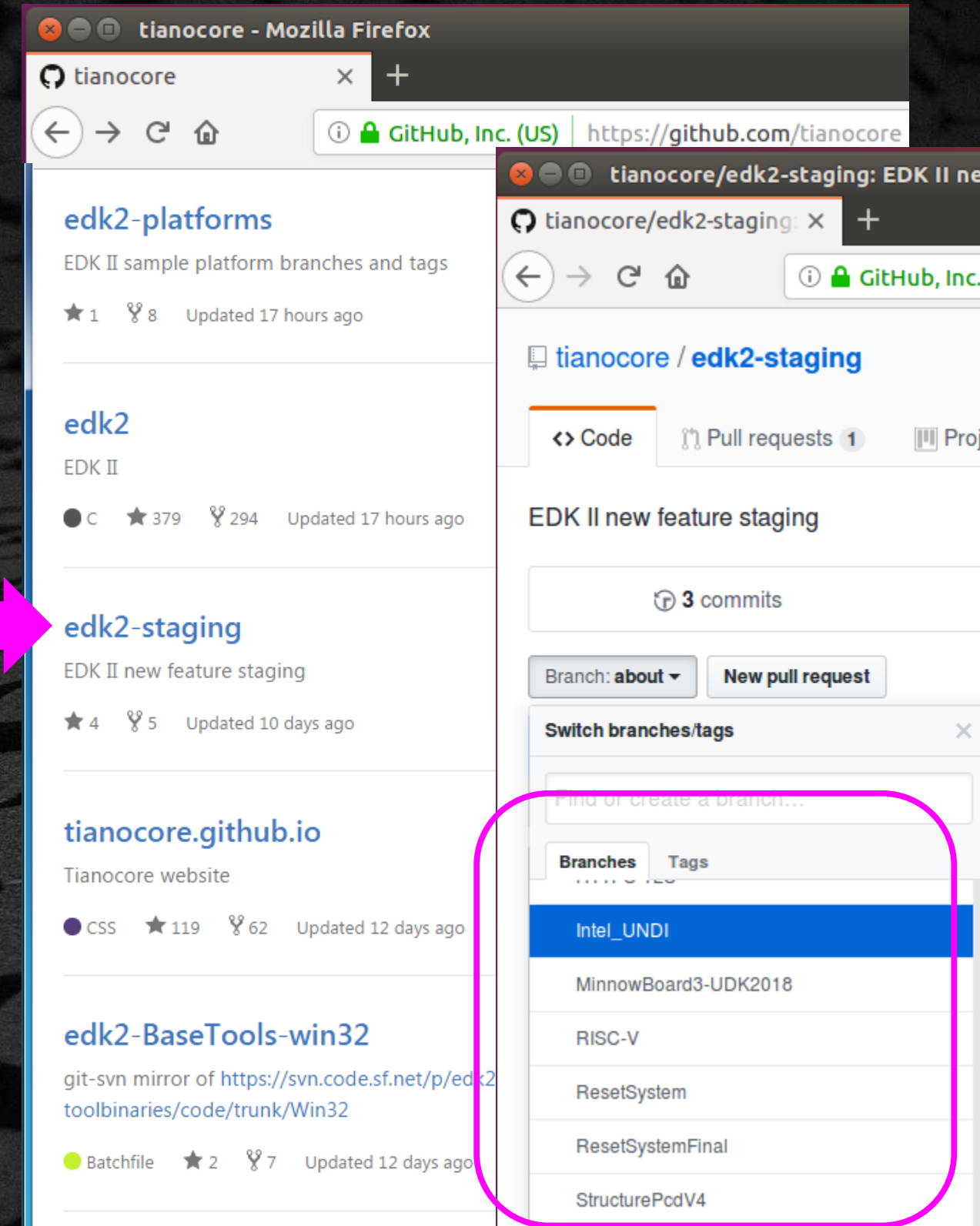
STAGING TIANOCORE.ORG

Implementations not yet Ready for
EDK II Main edk2-staging



Projects on branches

- AArch64StandaloneMN (ARM)
- Customized-Secure-Boot
- HTTPS-TLS
- RICS-V

- See *Readme.md* files



SUMMARY

-  Chart the organization of the Tianocore.org repositories
-  Recognize the various Open Source UEFI Platforms

Questions?



