

UEFI & EDK II Training

Platform Build Lab Up Xtreme- Linux

tianocore.org

Copy and Paste see [Lab Guide.md](#)

PLATFORM BUILD LABS

- ★ Download Minplatform Using Git from tianocore.org
- ★ Build a EDK II Platform using Up Xtreme Aaeon board

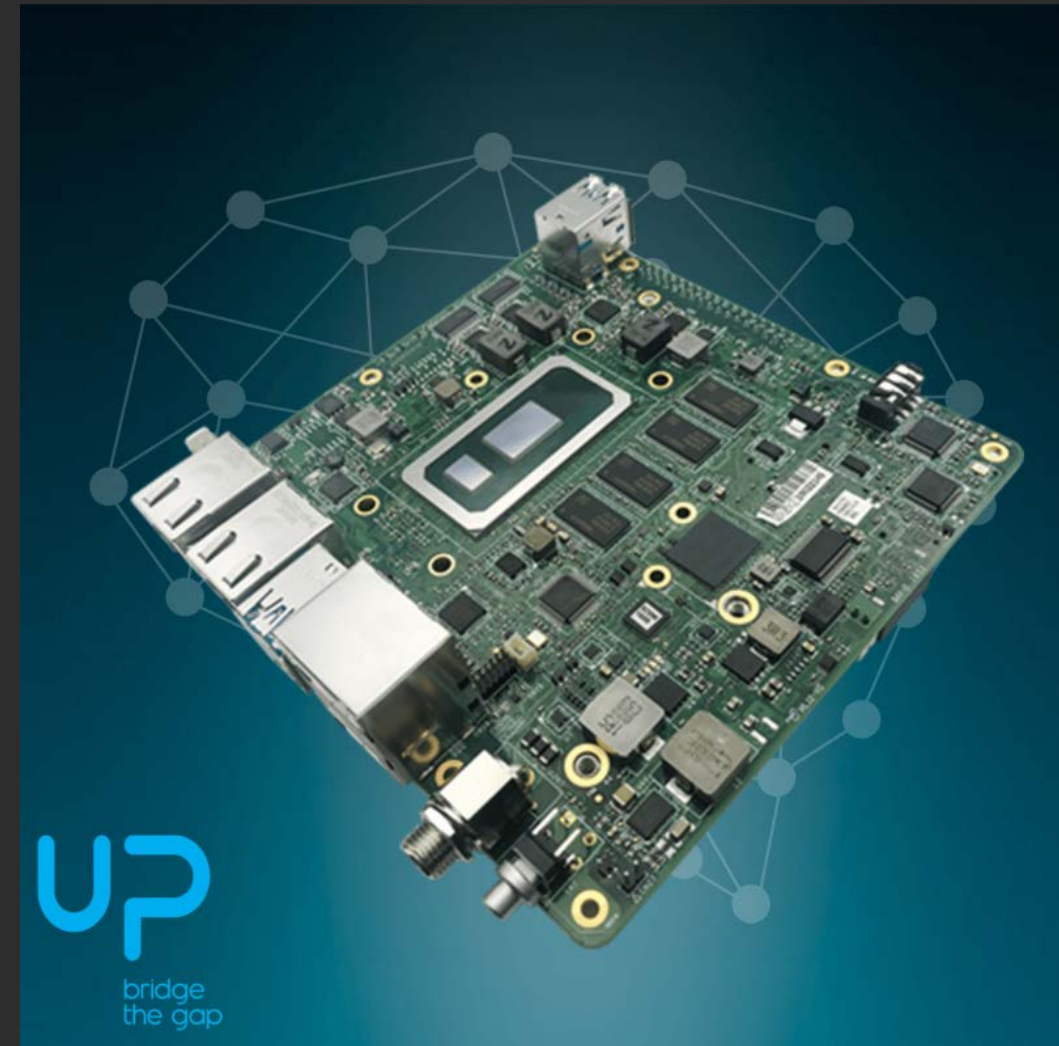
DOWNLOAD MINPLATFORM

Use Git to download EDK II and MinPlatform

EDK II Platform – Up Xtreme by Aaeon



8th Generation Intel® Core™
U-Series processors
(Formerly Whiskey Lake)



UP Board products
Up Shop

Linux setup for Up Xtreme Lab



ubuntu

Lab Setup Requirements – Ubuntu 16.04

```
bash$ sudo apt-get install build-essential uuid-dev iasl git gcc-5 nasm
bash$ sudo apt-get install screen
bash$ sudo apt-get install gcab
```



Lab Setup Requirements – Clear Linux* Project

```
bash$ sudo swupd bundle-add devpkg-util-linux
bash$ sudo swupd bundle-add devpkg-gcab
```

Open Terminal Prompt.

Cd to the Workspace and create the Up Xtreme build directory “UpX”

```
bash$ cd ~/src
bash$ mkdir UpX
bash$ cd UpX
```


Download the source for Edk II, MinPlatform and FSP

From a terminal prompt at ~/src/Upx , do the following:

- Edk2 For SHA to checkout see [Lab Guide.md](#)

```
$ git clone --recursive https://github.com/tianocore/edk2
```

- Edk2-platforms

```
$ git clone https://github.com/tianocore/edk2-platforms.git
```

- Edk2-non-os

```
$ git clone https://github.com/tianocore/edk2-non-os.git
```

- FSP

```
$ git clone https://github.com/IntelFsp/FSP.git
```


Set PROXYS FIRST

```
$ git config --global https.proxy=proxy.hf.intel.com:911  
$ git config --global http.proxy=proxy.hf.intel.com:911
```



Takes
about 6
minutes

Download MinPlatform Lab Material

Download the PlatformBuildLab_MinPlatform_FW.zip from :  [github.com](https://github.com/tianocore-training/PlatformBuildLab2_FW.zip)
[PlatformBuildLab2_FW.zip](https://github.com/tianocore-training/PlatformBuildLab2_FW.zip)

OR

Use `git clone` to download the PlatformBuildLab_MinPlatform_FW

```
C:/> git clone https://github.com/tianocore-training/PlatformBuildLab\_MinPlatform\_FW.git
```

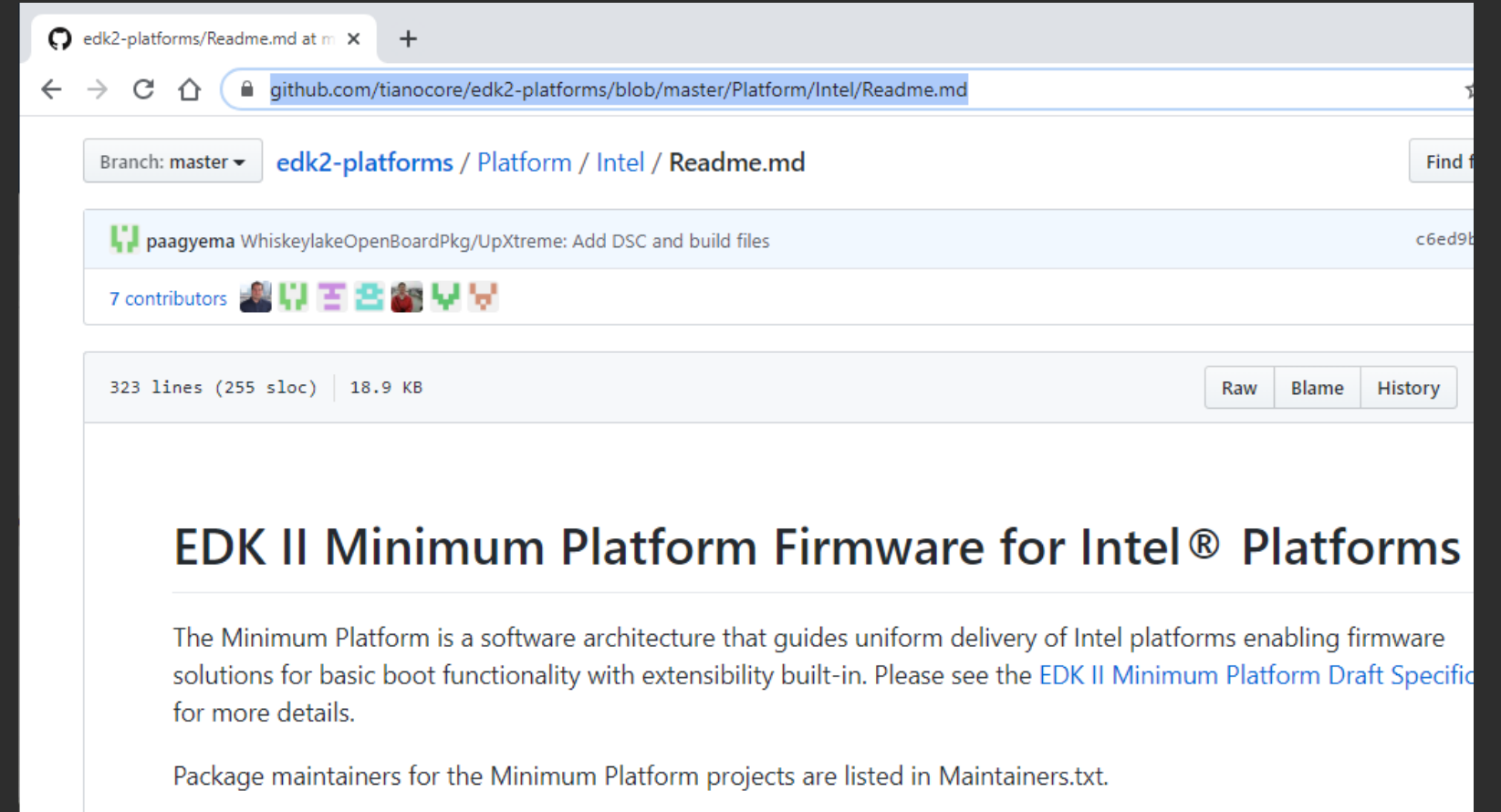
Directory PlatformBuildLab_MinPlatform_FW will be created

```
/FW
/MinPlatformBuild
- UpX_Lab          - Lab Material
. . .
```

BUILD UP XTREME

Where to get Open Source Up Xtreme

How to Download & Build: Open Source MinPlatform [Readme.md](#)



MinPlatform Open Board Tree Structure

edk2/ <https://github.com/tianocore/edk2>

...

edk2-platforms/ <https://github.com/tianocore/edk2-platforms>

Platform/

Intel/

BoardModulePkg

WhiskeylakeOpenBoardPkg

UpXtreme

MinPlatformPkg

Silicon/

Intel/

CoffeelakeSiliconPkg

...

Features/Intel

AdvancedFeaturePkg

edk2-non-os/ <https://github.com/tianocore/edk2-non-os>

Silicon/

Intel/

CoffeelakeSiliconBinPkg

FSP/ <https://github.com/IntelFsp/FSP>

CoffeelakeFspBinPkg

Invoke the build_bios.py from
here

Platform DSC & FDF here

Open a Terminal Command Prompt

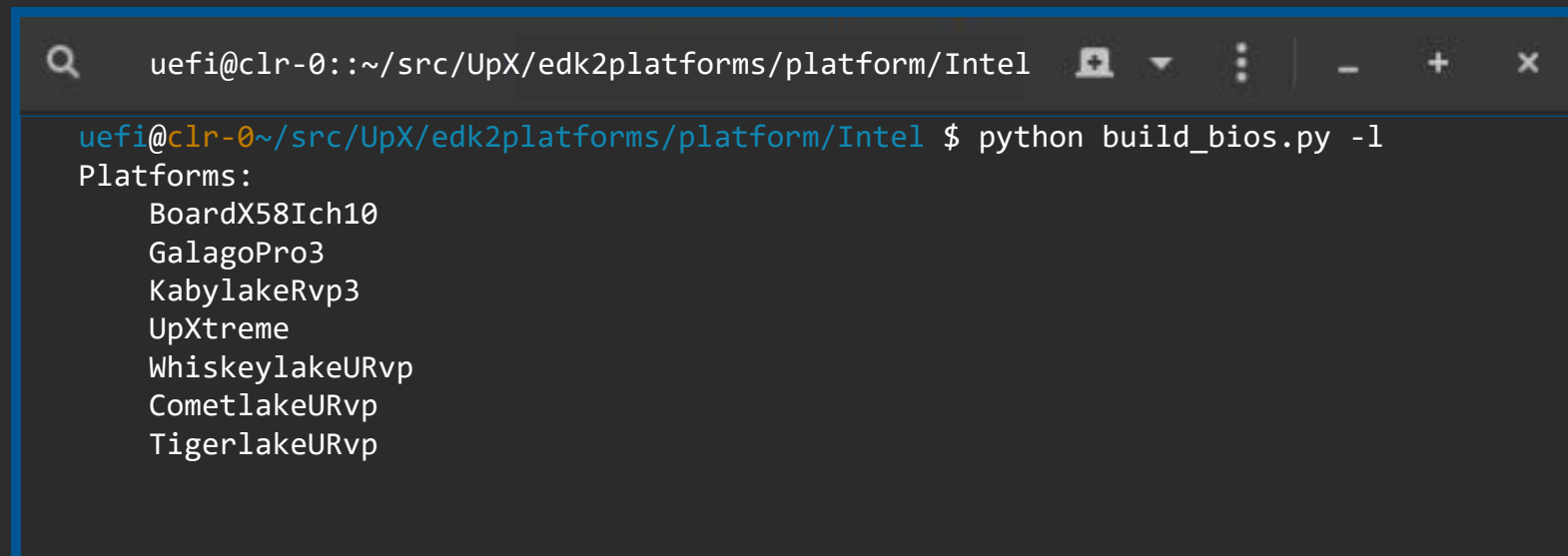
```
bash$ cd ~/src/UpX/edk2
bash$ source edksetup.sh
bash$ cd ..
bash$ cd edk2-platforms/Platform/Intel
```

Check if Python okay (may also need to set PYTHON_HOME)

```
bash$ python --version
Python 3.8.2
```

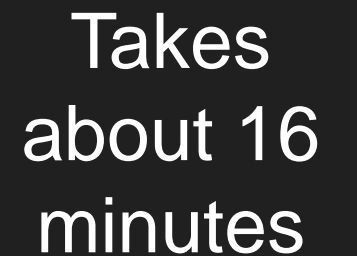
Check for available MinPlatform Boards

```
bash$ python build_bios.py -l
```



```
uefi@clr-0:~/src/UpX/edk2platforms/platform/Intel
uefi@clr-0~/src/UpX/edk2platforms/platform/Intel $ python build_bios.py -l
Platforms:
BoardX58Ich10
GalagoPro3
KabylakeRvp3
UpXtreme
WhiskeylakeURvp
CometlakeURvp
TigerlakeURvp
```

```
$> python build_bios.py -p UpXtreme -t GCC5
```



Note example screen shots are from windows but same information would be on the terminal screen for Linux

Platform Config

Many Platforms have a bash, bat or Python script file to pre or post process the EDK II build process

For MinPlatform platform specific config

Build processing:

Build_config.cfg – Lists directories required for the build and build settings

Link to Up Xtreme [Build_config.cfg](#)

Examine Build Parameters

```
Python build_bios.py -p UpXtreme
```

...

```
Calling build -n 0 --log=Build.log --report-file=BuildReport.log  
and from UpX\conf\target.txt
```

TARGET	= DEBUG
TARGET_ARCH	= IA32 X64
TOOL_CHAIN_TAG	= GCC5
ACTIVE_PLATFORM	= ... /WhiskylakeOpenBoardPkg/ UpXtreme/OpenBoardPkg.dsc
Report file created (via python script)	= BuildReport.log

Build Mode

CPU Architecture

VS Tool Chain

Platform DSC file

PCDs, Libs, etc.

Platform Build and PCD Parameters

Platform Parameters

Many Platform Parameters are defined in a top .DSC file that controls PCD and build switches

For Up Xtreme : edk2-platforms/Platform/Intel/WhiskeylakeOpenBoardPkg/UpXtremeOpenBoardPkgPcd.dsc and OpenBoardPkgBuildOption.dsc

Example:

```
# Define Build Options both for EDK and EDKII drivers.
```

```
DEFINE DSC_S3_BUILD_OPTIONS =  
DEFINE DSC_CSM_BUILD_OPTIONS =
```

```
!if gSiPkgTokenSpaceGuid.PcdAcpiEnable == TRUE  
  DEFINE DSC_ACPI_BUILD_OPTIONS = -DACPI_SUPPORT=1  
!else  
  DEFINE DSC_ACPI_BUILD_OPTIONS =  
!endif
```

```
DEFINE BIOS_GUARD_BUILD_OPTIONS =  
DEFINE OVERCLOCKING_BUILD_OPTION =
```

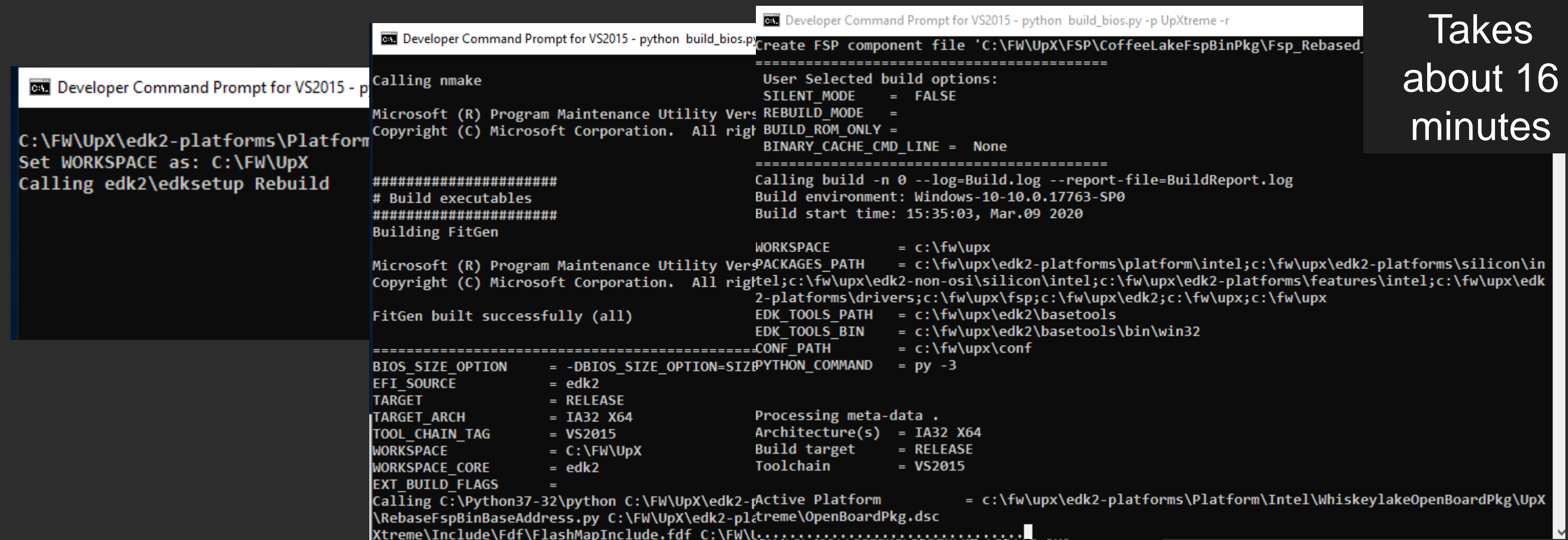
Build Process for RELEASE Target

Invoke the Python Build script for Up Xtreme

```
bash$ python build_bios.py -p UpXtreme -r -t GCC5
```



Takes
about 16
minutes



```

Developer Command Prompt for VS2015 - p
C:\FW\UpX\edk2-platforms\Platform
Set WORKSPACE as: C:\FW\UpX
Calling edk2\edksetup Rebuild

Developer Command Prompt for VS2015 - python build_bios.py
Calling nmake
Microsoft (R) Program Maintenance Utility Vers
Copyright (C) Microsoft Corporation. All right

#####
# Build executables
#####
Building FitGen

Microsoft (R) Program Maintenance Utility Vers
Copyright (C) Microsoft Corporation. All right

FitGen built successfully (all)

=====
BIOS_SIZE_OPTION = -DBIOS_SIZE_OPTION=SIZE
EFI_SOURCE        = edk2
TARGET            = RELEASE
TARGET_ARCH       = IA32 X64
TOOL_CHAIN_TAG    = VS2015
WORKSPACE         = C:\FW\UpX
WORKSPACE_CORE    = edk2
EXT_BUILD_FLAGS  =

Calling C:\Python37-32\python C:\FW\UpX\edk2-p
\RebaseFspBinBaseAddress.py C:\FW\UpX\edk2-plat
Xtreme\Include\Fdf\FlashMapInclude.fdf C:\FW\U

Developer Command Prompt for VS2015 - python build_bios.py -p UpXtreme -r
Create FSP component file 'C:\FW\UpX\FSP\CoffeeLakeFspBinPkg\Fsp_Rebased_
=====
User Selected build options:
SILENT_MODE      = FALSE
REBUILD_MODE     =
BUILD_ROM_ONLY   =
BINARY_CACHE_CMD_LINE = None
=====
Calling build -n 0 --log=Build.log --report-file=BuildReport.log
Build environment: Windows-10-10.0.17763-SP0
Build start time: 15:35:03, Mar.09 2020

=====
WORKSPACE        = c:\fw\upx
PACKAGES_PATH    = c:\fw\upx\edk2-platforms\platform\intel;c:\fw\upx\edk2-platforms\silicon\in
tel;c:\fw\upx\edk2-non-osi\silicon\intel;c:\fw\upx\edk2-platforms\features\intel;c:\fw\upx\edk
2-platforms\drivers;c:\fw\upx\fsp;c:\fw\upx\edk2;c:\fw\upx;c:\fw\upx
EDK_TOOLS_PATH   = c:\fw\upx\edk2\basetools
EDK_TOOLS_BIN    = c:\fw\upx\edk2\basetools\bin\win32
CONF_PATH        = c:\fw\upx\conf
PYTHON_COMMAND   = py -3

Processing meta-data .
Architecture(s)  = IA32 X64
Build target     = RELEASE
Toolchain        = VS2015

Active Platform  = c:\fw\upx\edk2-platforms\Platform\Intel\WhiskeylakeOpenBoardPkg\UpX
=====

```

Note example screen shots are from windows but same information would be on the terminal screen for Linux

DEBUG & RELEASE Differences

Slower boot because the time it takes to display debug info

Larger image because of debug code & embedded info

Uses the serial port for debug string output

Contains detailed debug strings that show the boot process and various ASSERT/TRACE errors

Directory: ~/MinPlatformBuildLab_FW/FW/MinPlatformBuildLab/UpX_Lab

Copy Logo.bmp to ~/src/UpX/edk2/MdeModulePkg/Logo

Or create a .BMP with your favorite Paint application



See . . . WhiskeylakeOpenBoardPkg/UpXtreme/OpenBoardPkg.fdf line 285

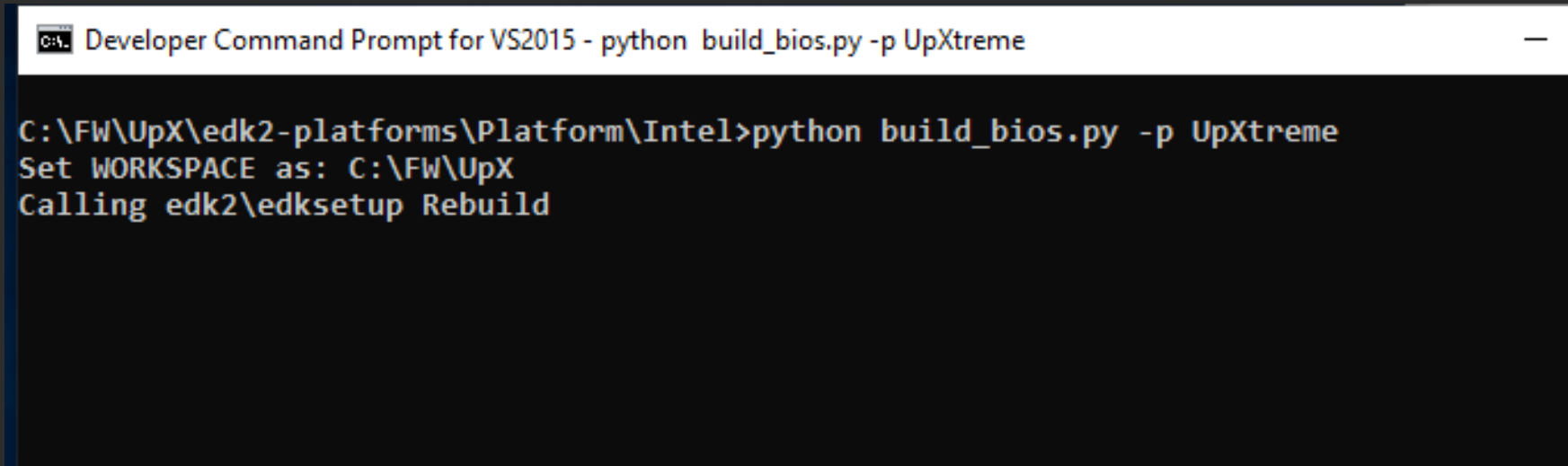
Build with new logo

Invoke the Python Build script for Up Xtreme

```
$> python build_bios.py -p UpXtreme -t GCC5
```



Takes
about 2
minutes



```
Developer Command Prompt for VS2015 - python build_bios.py -p UpXtreme  
C:\FW\UpX\edk2-platforms\Platform\Intel>python build_bios.py -p UpXtreme  
Set WORKSPACE as: C:\FW\UpX  
Calling edk2\edksetup Rebuild
```

Note example screen shots are from windows but same information would be on the terminal screen for Linux

Build Process Completed

Locate the build .fd images

```

uefi@clr-0:~/src/UpX/edk2platforms/platform/Intel

#####
# FIT Table: #
#####
FIT Pointer Offset: 0x40
FIT Table Address: 0xffff6b80
=====
Index:      Address      Size  Version      Type      C_V  Checksum (Index  Data Width Bit  Offset)
=====
00:  2020205f5449465f 000004  0100  00-'_FIT_'  01    e8
01:  00000000ffe50060 000000  0100  01-MICROCODE 00    00
02:  00000000ffe69460 000000  0100  01-MICROCODE 00    00
03:  00000000ffe82860 000000  0100  01-MICROCODE 00    00
=====
Index:      Address      Size  Version      Type      C_V  Checksum (Index  Data Width Bit  Offset)
=====
Done
Fd file can be found at ~/src/UpX/Build/WhiskeylakeOpenBoardPkg/UpXtreme/DEBUG_GCC5/FV/UPXTREME.fd

uefi@clr-0~/src/UpX/edk2platforms/platform/Intel $

```

The script displays the location of the final .fd files

- ✿ Download Minplatform Using Git Bash
- ✿ Build a EDK II Platform using Up Xtreme Aaeon board

Questions?



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ACKNOWLEDGEMENTS

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