

UEFI & EDK II Training

UEFI Driver Wizard Lab - Windows

tianocore.org

LESSON OBJECTIVE

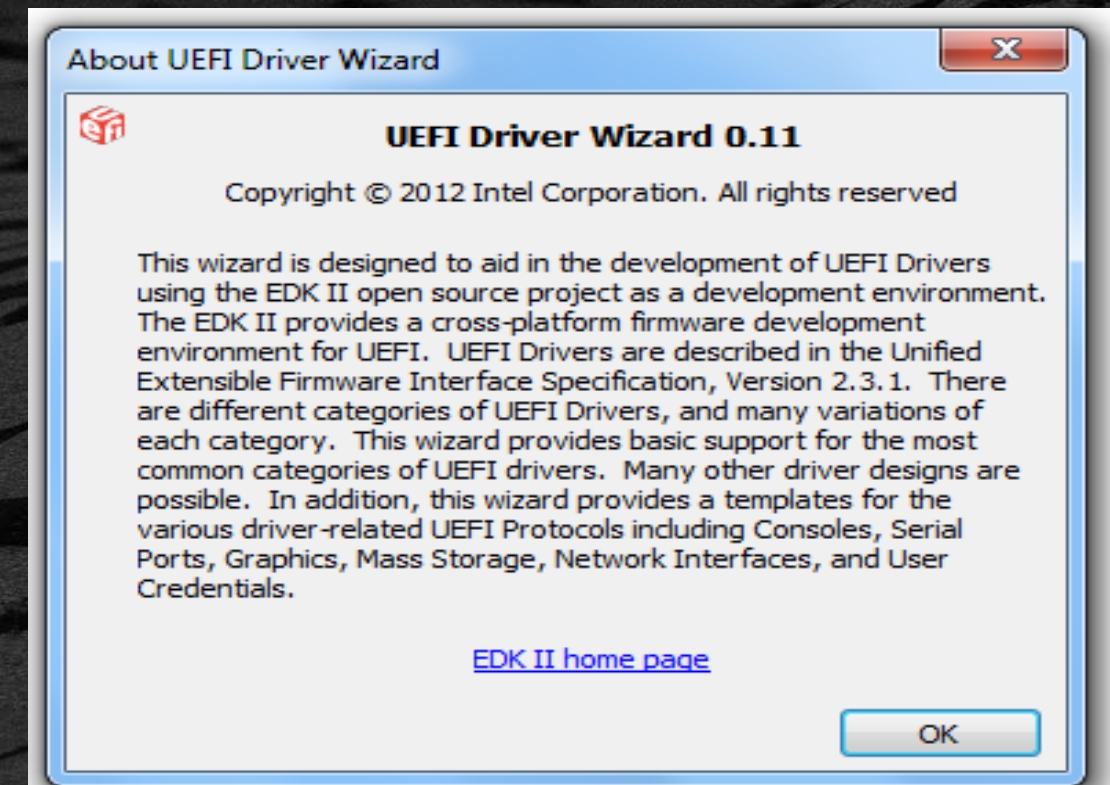
- ✱ Setup the UEFI Driver Wizard
- ✱ Create a UEFI Driver Template

UEFI DRIVER WIZARD

Creating a Template UEFI Driver with the UEFI Driver Wizard

UEFI Driver Wizard Overview

- ✓ Open source tool
- ✓ Based on *Driver Writer's Guide for UEFI 2.3.1* content
- ✓ Intel SSG engineers contributed
- ✓ Located on www.TianoCore.org



Installing UEFI Driver Wizard

Requirements and Options

- Work space must contain BaseTools, MdePkg & MdeModulePkg Packages from [UDK2018](#) for Driver development on Tianocore.org
- Uses previous lab's setup w/ Windows C:\FW\edk2
- Python* scripts from [Github Link](#) then use instructions from README for Python and wxPython versions to install then run

```
bash$ python launch.py
```


Requirements for Your Driver



Using UEFI Driver Wizard

- UEFI Device Driver
- UEFI Version 2.7 (0x00020046)

```
#define EFI_2_70_SYSTEM_TABLE_REVISION ((2<<16) | (70DEC))
```

- Unloadable driver
- Support IA32 & x64 CPUs
- Returns component name information
- Test console device
- Option to produce strings & forms for setup

Template File Contents

Proper UEFI driver entry point

Template File Contents

Proper UEFI driver entry point

Basic driver libraries/headers

Template File Contents

Proper UEFI driver entry point

Basic driver libraries/headers

Skeletons for common driver functions

Template File Contents

Proper UEFI driver entry point

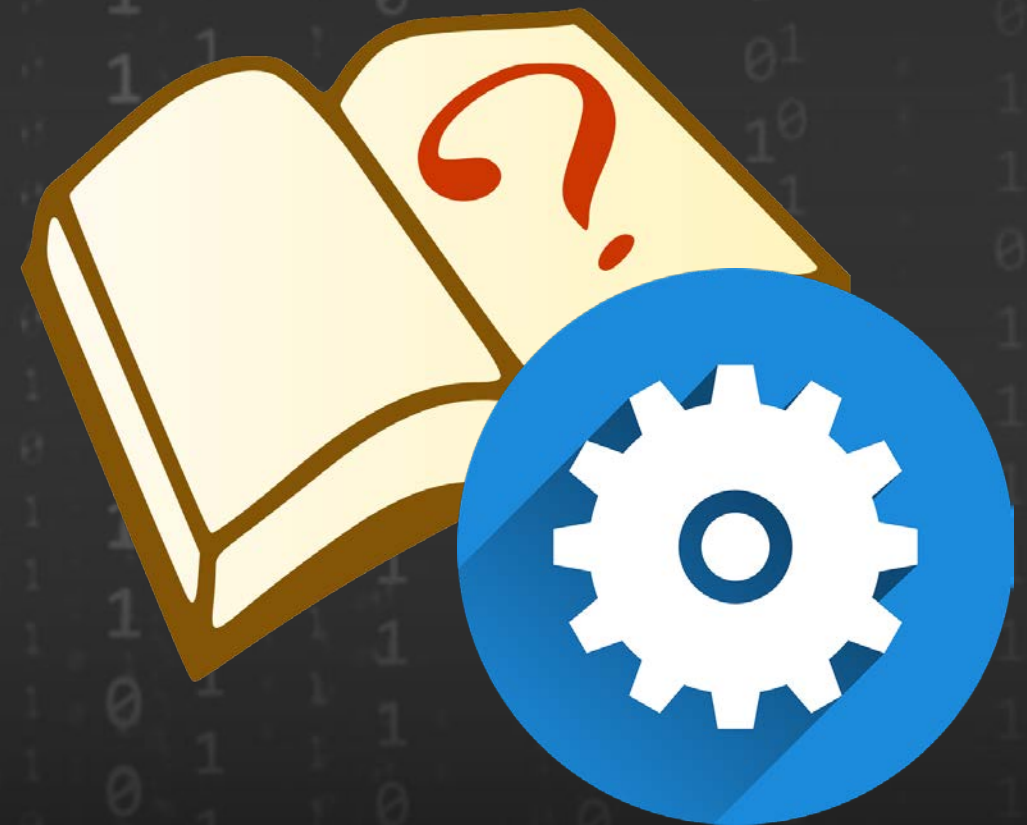
Basic driver libraries/headers

Skeletons for common driver functions

Error values until ported
EFI_UNSUPPORTED, EFI_DEVICE_ERROR

Lab 1: Create a UEFI Driver with the UEFI Driver Wizard

- In this lab, you'll create a new UEFI driver using the UEFI Driver Wizard.
- This will create a set of "c" code files to be used as a template UEFI Driver used in the subsequent driver labs



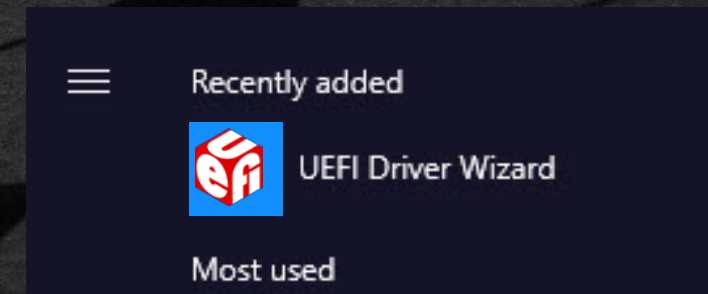
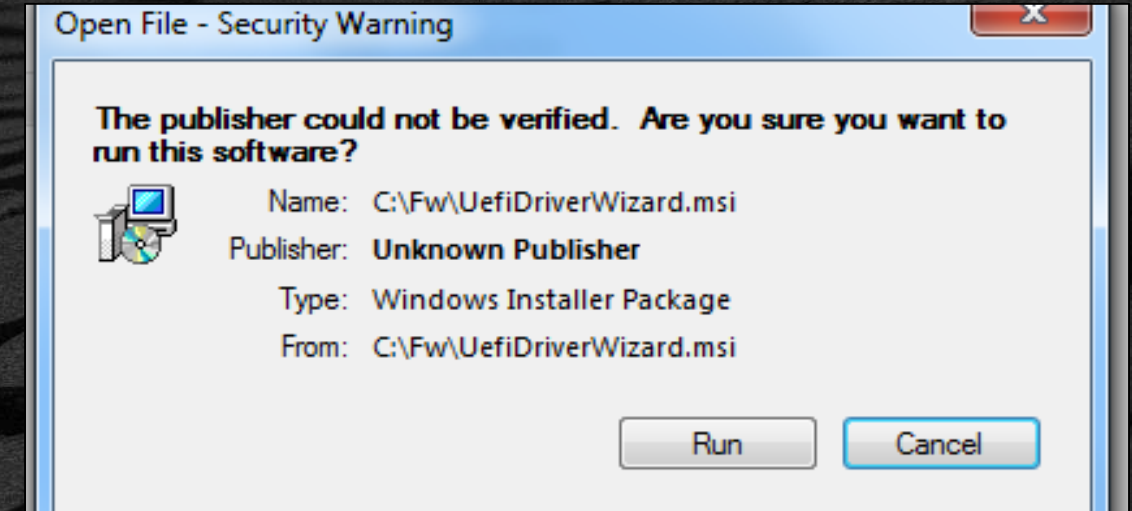
Lab 1: Install UEFI Driver Wizard

First setup for Building EDK II for Nt32, See [Lab Setup](#)

Install UEFI Driver Wizard

1. **Open and Run**
/FW/DriverWizard/UefiDriverWizard.msi
2. **Click** through “Next” until install finishes

Open the UEFI Driver Wizard

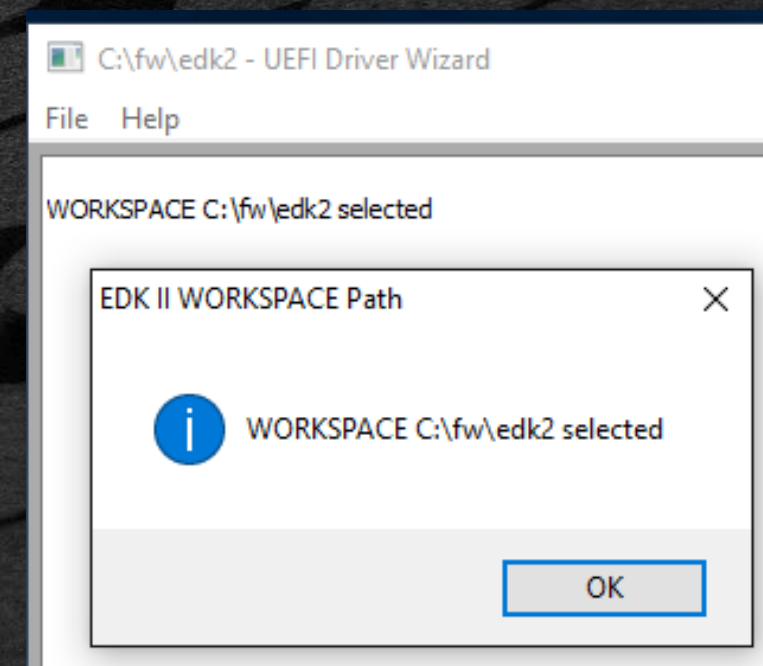
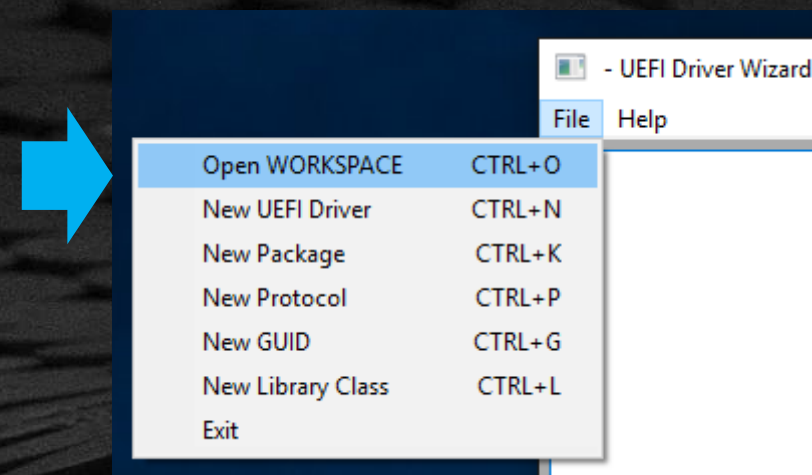


Lab 1: UefiDriverWizard -Select Work Space

Click on File and Select
“Open WORKSPACE”
Or
Control+O

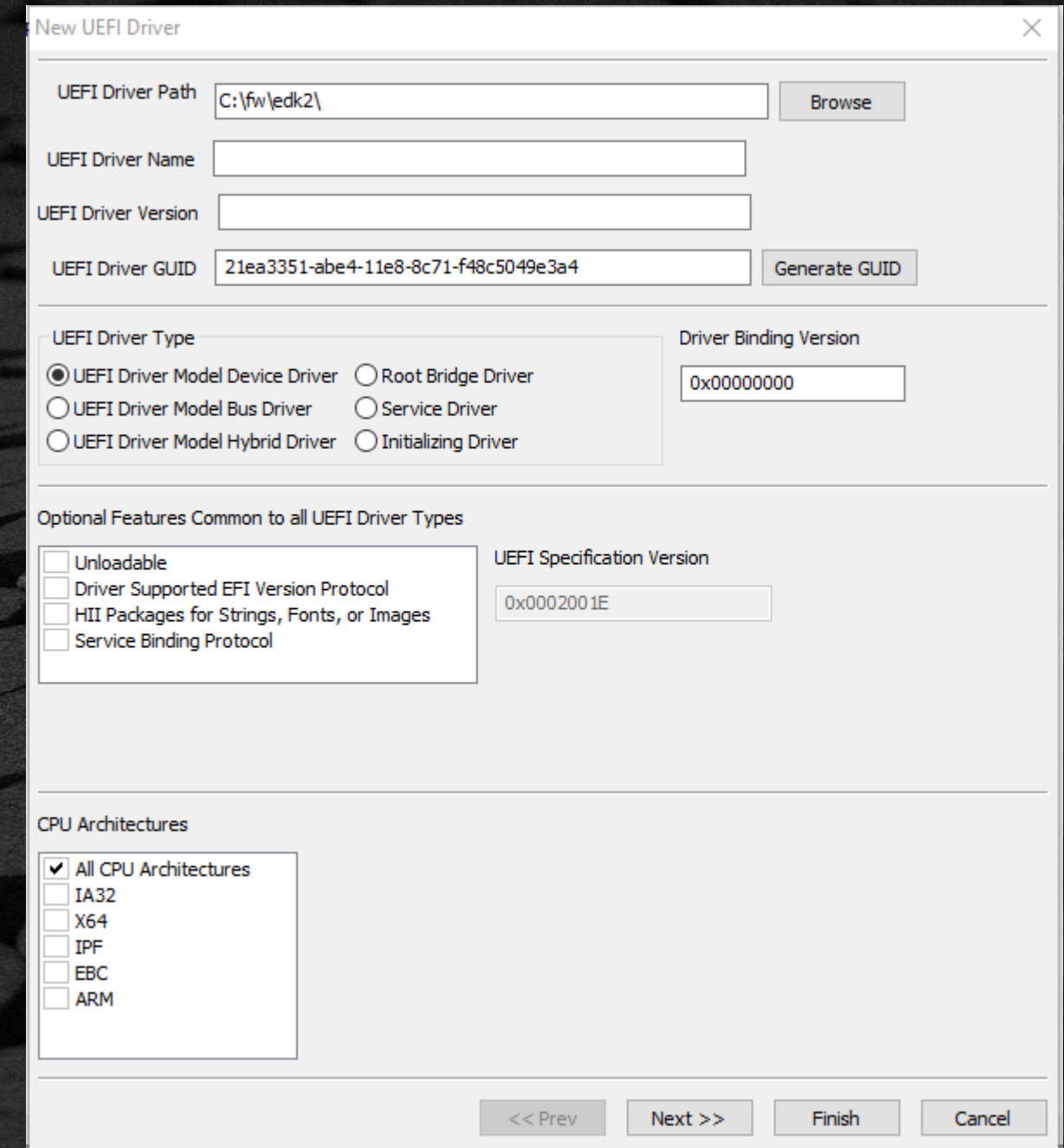
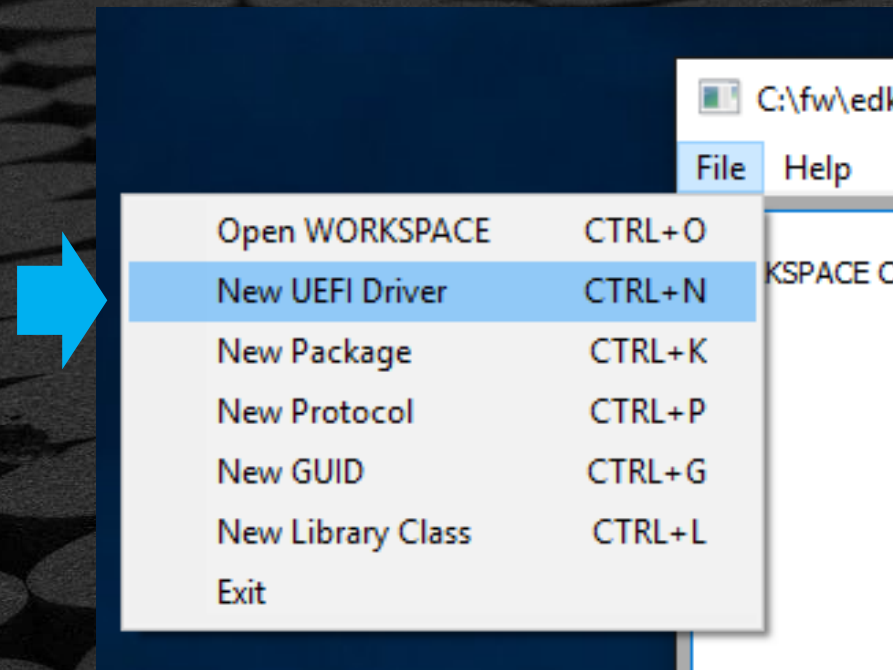
Browse to C:/FW/edk2
Select “OK”
Should say “WORKSPACE C:\FW\edk2 selected

Note: the environment for EDK II must be setup with edksetup.bat



Lab 1: Create a New UEFI Driver

Control+N – to Open Menu



The image shows a screenshot of the 'New UEFI Driver' dialog box. The dialog box contains the following fields and options:

- UEFI Driver Path:** C:\fw\edk2\ (with a 'Browse' button)
- UEFI Driver Name:** (empty text field)
- UEFI Driver Version:** (empty text field)
- UEFI Driver GUID:** 21ea3351-abe4-11e8-8c71-f48c5049e3a4 (with a 'Generate GUID' button)
- UEFI Driver Type:** Radio buttons for:
 - ☒ UEFI Driver Model Device Driver
 - ☐ UEFI Driver Model Bus Driver
 - ☐ UEFI Driver Model Hybrid Driver
 - ☐ Root Bridge Driver
 - ☐ Service Driver
 - ☐ Initializing Driver
- Driver Binding Version:** 0x00000000
- Optional Features Common to all UEFI Driver Types:** Checkboxes for:
 - ☐ Unloadable
 - ☐ Driver Supported EFI Version Protocol
 - ☐ HII Packages for Strings, Fonts, or Images
 - ☐ Service Binding Protocol
- UEFI Specification Version:** 0x0002001E
- CPU Architectures:** Checkboxes for:
 - ☒ All CPU Architectures
 - ☐ IA32
 - ☐ X64
 - ☐ IPF
 - ☐ EBC
 - ☐ ARM

At the bottom of the dialog box, there are buttons for '<< Prev', 'Next >>', 'Finish', and 'Cancel'.

Lab 1:

New UEFI Driver Menu

- UEFI Driver Path” – Type: “MyWizardDriver”

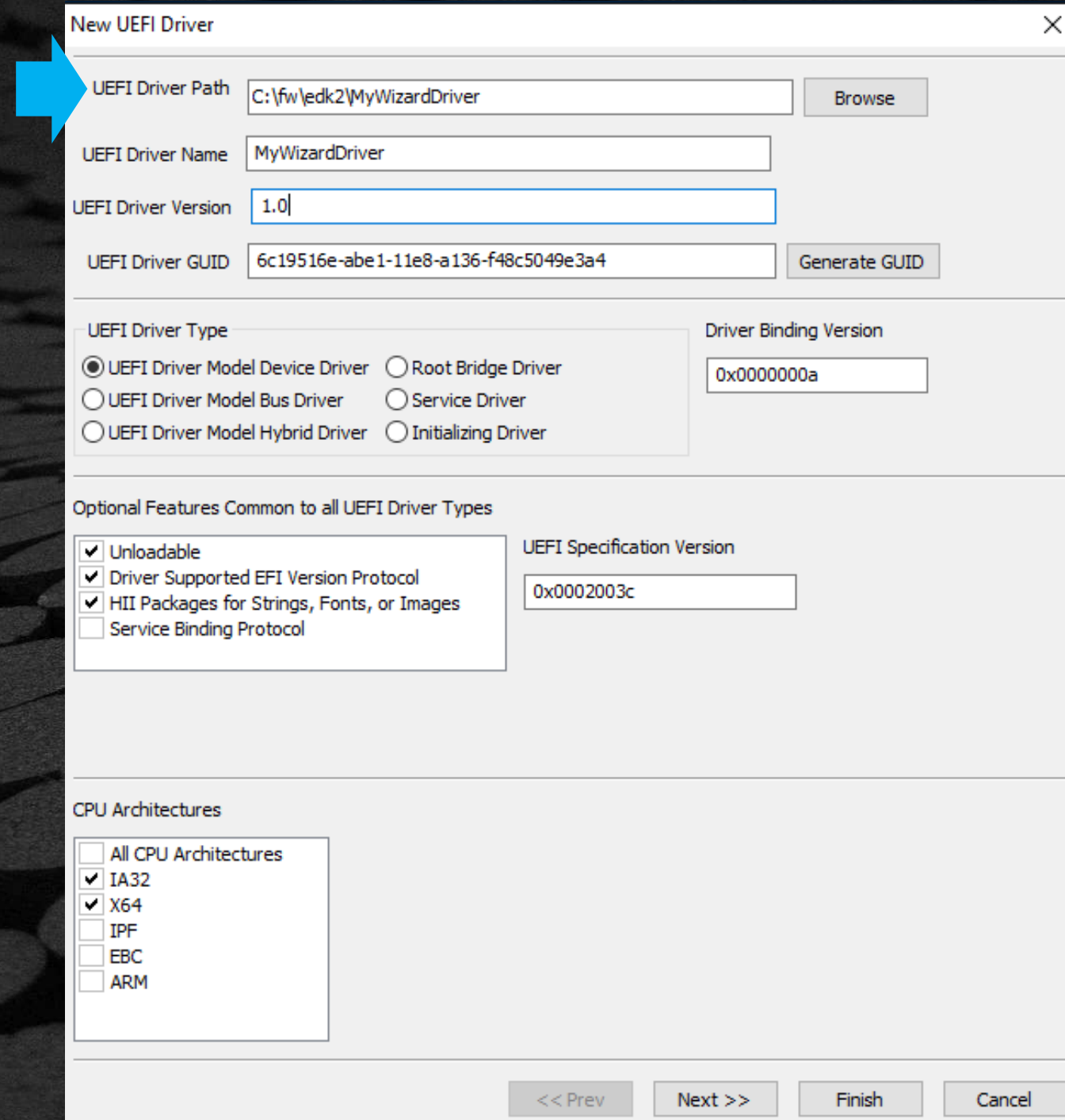
Note: “UEFI Driver Name” is filled in.

- **Ensure** all the forms, radio buttons, and boxes are filled in and **selected exactly** like the image to the right.

- **Note:** A new, specific driver GUID will populate, so it will be different than this image

Click

Next >>



New UEFI Driver

UEFI Driver Path: C:\fw\edk2\MyWizardDriver [Browse]

UEFI Driver Name: MyWizardDriver

UEFI Driver Version: 1.0

UEFI Driver GUID: 6c19516e-abe1-11e8-a136-f48c5049e3a4 [Generate GUID]

UEFI Driver Type:

- ☒ UEFI Driver Model Device Driver
- ☐ Root Bridge Driver
- ☐ UEFI Driver Model Bus Driver
- ☐ Service Driver
- ☐ UEFI Driver Model Hybrid Driver
- ☐ Initializing Driver

Driver Binding Version: 0x0000000a

Optional Features Common to all UEFI Driver Types:

- ☒ Unloadable
- ☒ Driver Supported EFI Version Protocol
- ☒ HII Packages for Strings, Fonts, or Images
- ☐ Service Binding Protocol

UEFI Specification Version: 0x0002003c

CPU Architectures:

- ☐ All CPU Architectures
- ☒ IA32
- ☒ X64
- ☐ IPF
- ☐ EBC
- ☐ ARM

<< Prev Next >> Finish Cancel

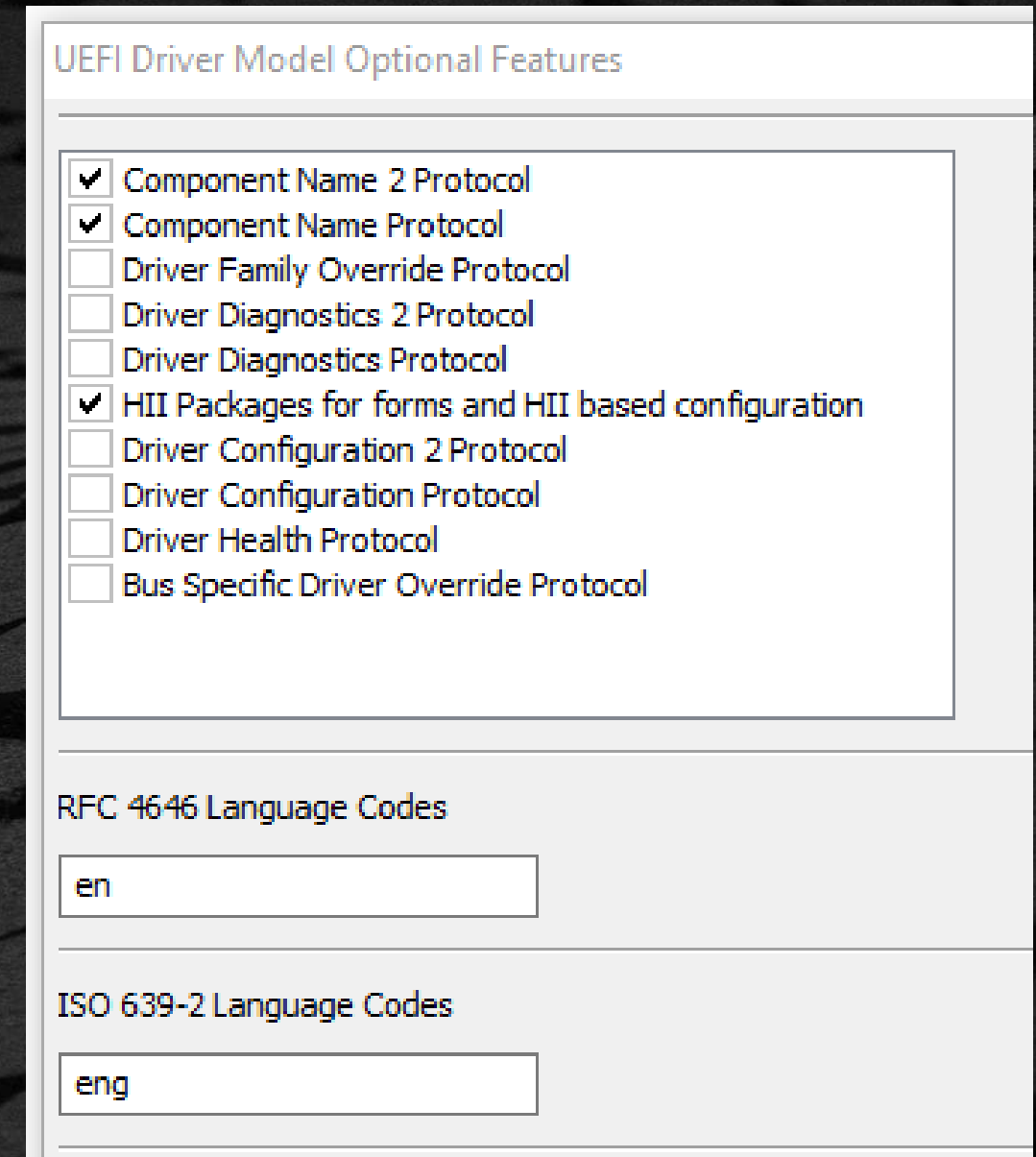
Lab 1: UEFI Driver Model Optional Features

Ensure all the forms, radio buttons, and boxes are filled in and **selected** *exactly* like the image to the right.

- ✓ "Component Name 2 Protocol"
- ✓ "Component Name Protocol"
- ✓ "HII Packages for Forms . . ."

Click

Next >>



The screenshot shows a configuration window titled "UEFI Driver Model Optional Features". It contains a list of optional features with checkboxes. The following features are checked: "Component Name 2 Protocol", "Component Name Protocol", and "HII Packages for forms and HII based configuration". The other features are unchecked: "Driver Family Override Protocol", "Driver Diagnostics 2 Protocol", "Driver Diagnostics Protocol", "Driver Configuration 2 Protocol", "Driver Configuration Protocol", "Driver Health Protocol", and "Bus Specific Driver Override Protocol". Below the list, there are two sections for language codes. The "RFC 4646 Language Codes" section has a text box containing "en". The "ISO 639-2 Language Codes" section has a text box containing "eng".

Feature	Selected
Component Name 2 Protocol	✓
Component Name Protocol	✓
Driver Family Override Protocol	
Driver Diagnostics 2 Protocol	
Driver Diagnostics Protocol	
HII Packages for forms and HII based configuration	✓
Driver Configuration 2 Protocol	
Driver Configuration Protocol	
Driver Health Protocol	
Bus Specific Driver Override Protocol	

RFC 4646 Language Codes

en

ISO 639-2 Language Codes

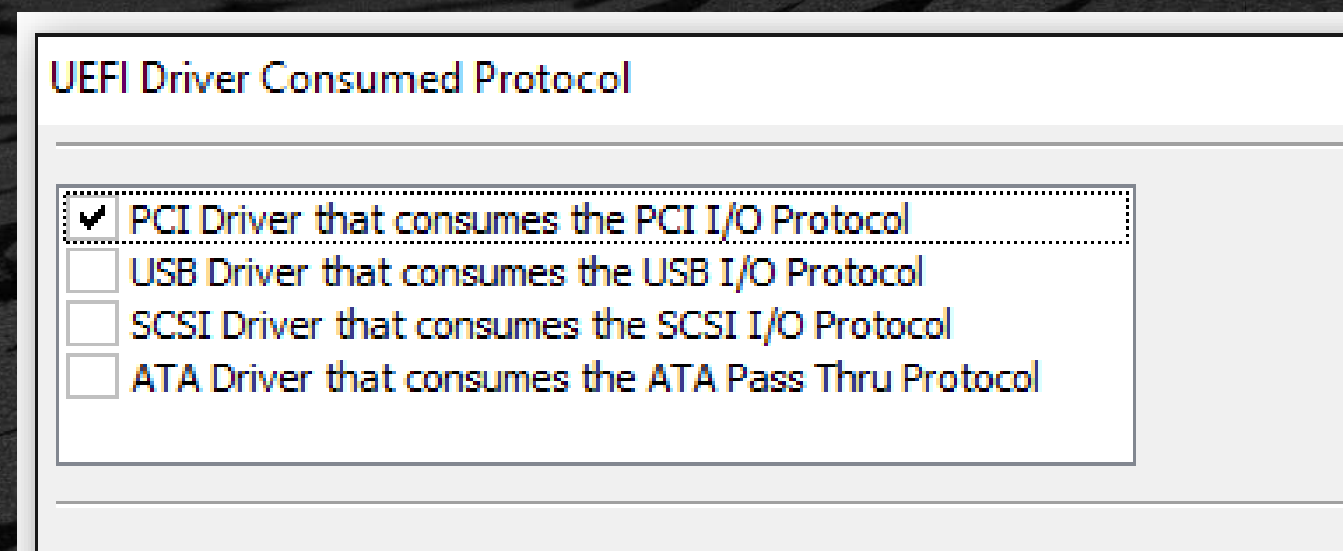
eng

Lab 1: UEFI Driver Consumed Protocol

Select

✓ “PCI Driver that consumes the PCI I/O Protocol”

Click



UEFI Driver Consumed Protocol

- ☒ PCI Driver that consumes the PCI I/O Protocol
- ☐ USB Driver that consumes the USB I/O Protocol
- ☐ SCSI Driver that consumes the SCSI I/O Protocol
- ☐ ATA Driver that consumes the ATA Pass Thru Protocol

Next >>

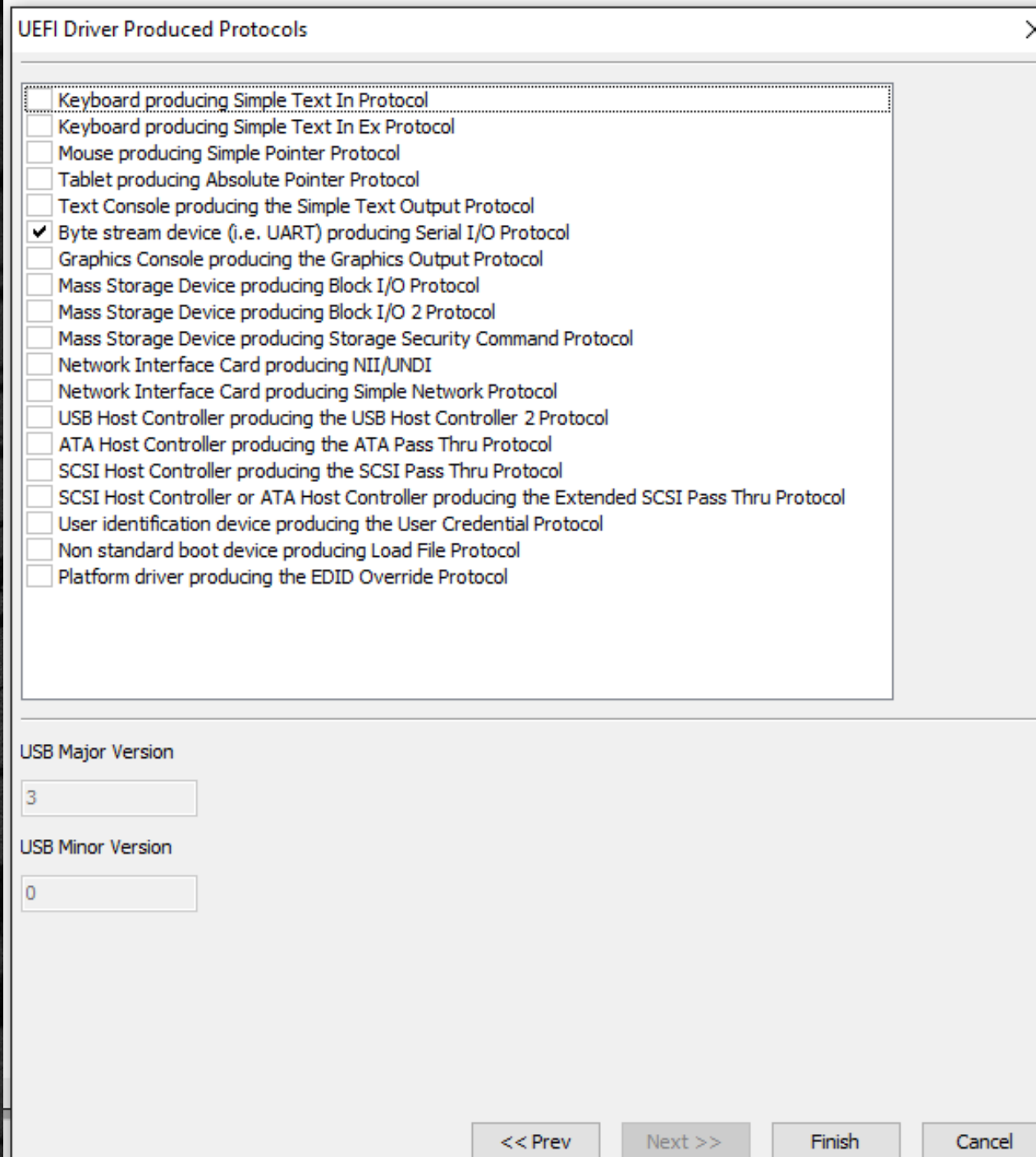
Lab1: UEFI Driver Produced Protocols

Select

- ✓ "Byte stream device (i.e.UART) producing Serial I/O Protocol"

Click

Finish



UEFI Driver Produced Protocols

- ☒ Keyboard producing Simple Text In Protocol
- ☐ Keyboard producing Simple Text In Ex Protocol
- ☐ Mouse producing Simple Pointer Protocol
- ☐ Tablet producing Absolute Pointer Protocol
- ☐ Text Console producing the Simple Text Output Protocol
- ☒ Byte stream device (i.e. UART) producing Serial I/O Protocol
- ☐ Graphics Console producing the Graphics Output Protocol
- ☐ Mass Storage Device producing Block I/O Protocol
- ☐ Mass Storage Device producing Block I/O 2 Protocol
- ☐ Mass Storage Device producing Storage Security Command Protocol
- ☐ Network Interface Card producing NII/UNDI
- ☐ Network Interface Card producing Simple Network Protocol
- ☐ USB Host Controller producing the USB Host Controller 2 Protocol
- ☐ ATA Host Controller producing the ATA Pass Thru Protocol
- ☐ SCSI Host Controller producing the SCSI Pass Thru Protocol
- ☐ SCSI Host Controller or ATA Host Controller producing the Extended SCSI Pass Thru Protocol
- ☐ User identification device producing the User Credential Protocol
- ☐ Non standard boot device producing Load File Protocol
- ☐ Platform driver producing the EDID Override Protocol

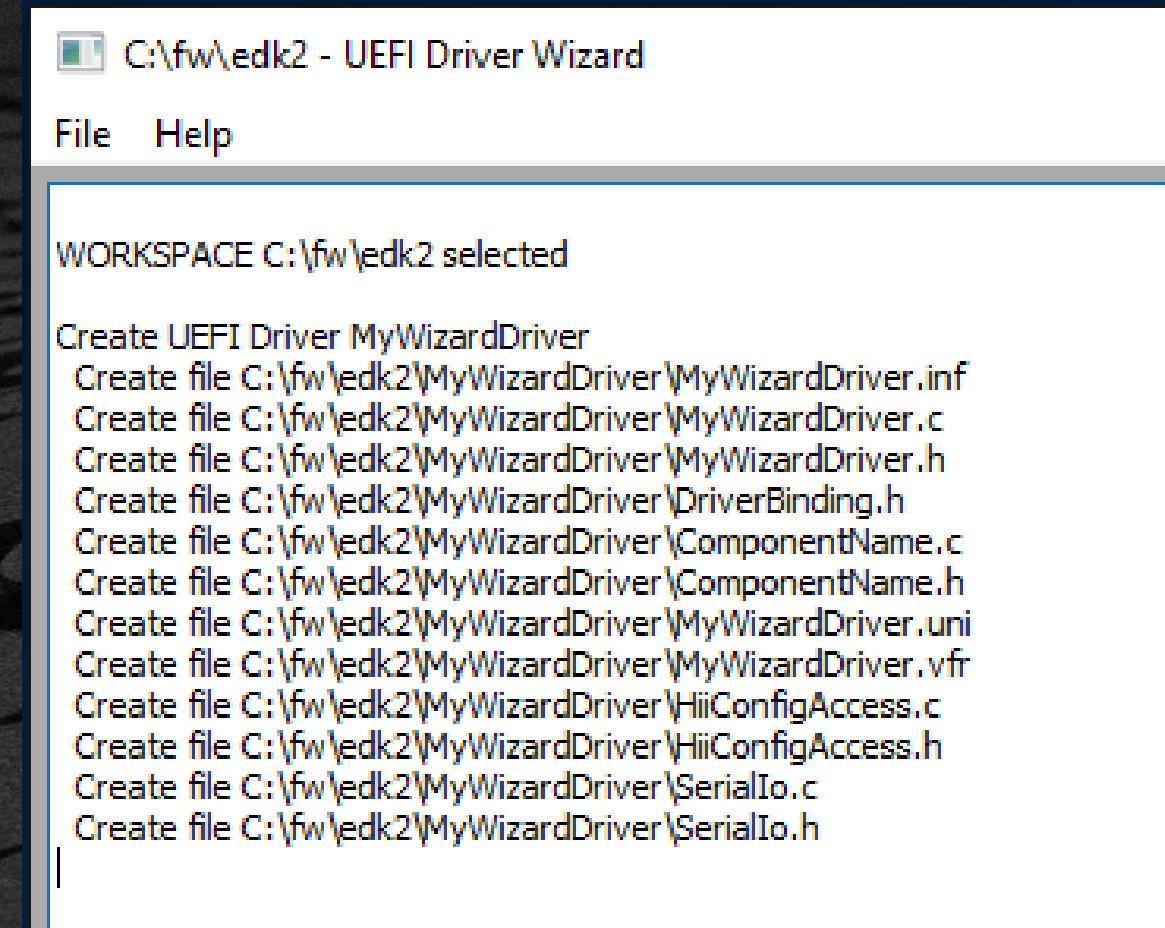
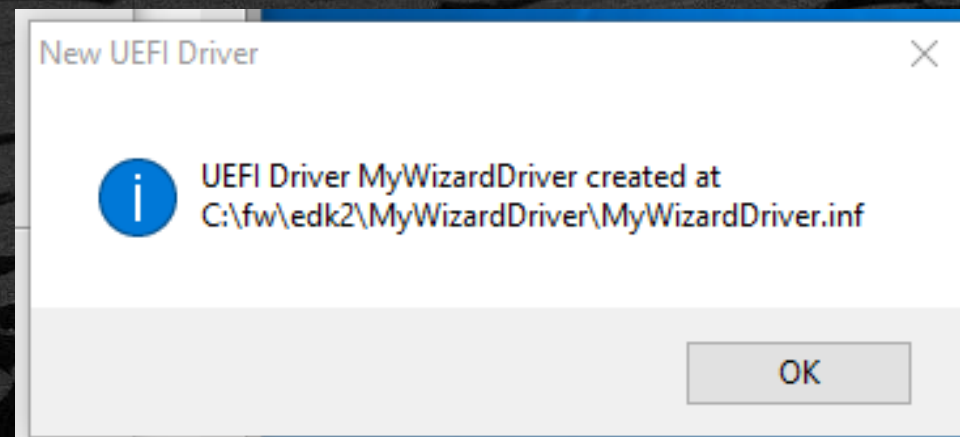
USB Major Version
3

USB Minor Version
0

<< Prev Next >> Finish Cancel

Lab 1: UEFI Driver Created

UEFI Driver template created



SUMMARY

- ✱ Setup the UEFI Driver Wizard
- ✱ Create a UEFI Driver Template

Questions?



