

UEFI & EDK II Training

UEFI Driver Wizard Lab - Windows

tianocore.org

LESSON OBJECTIVE

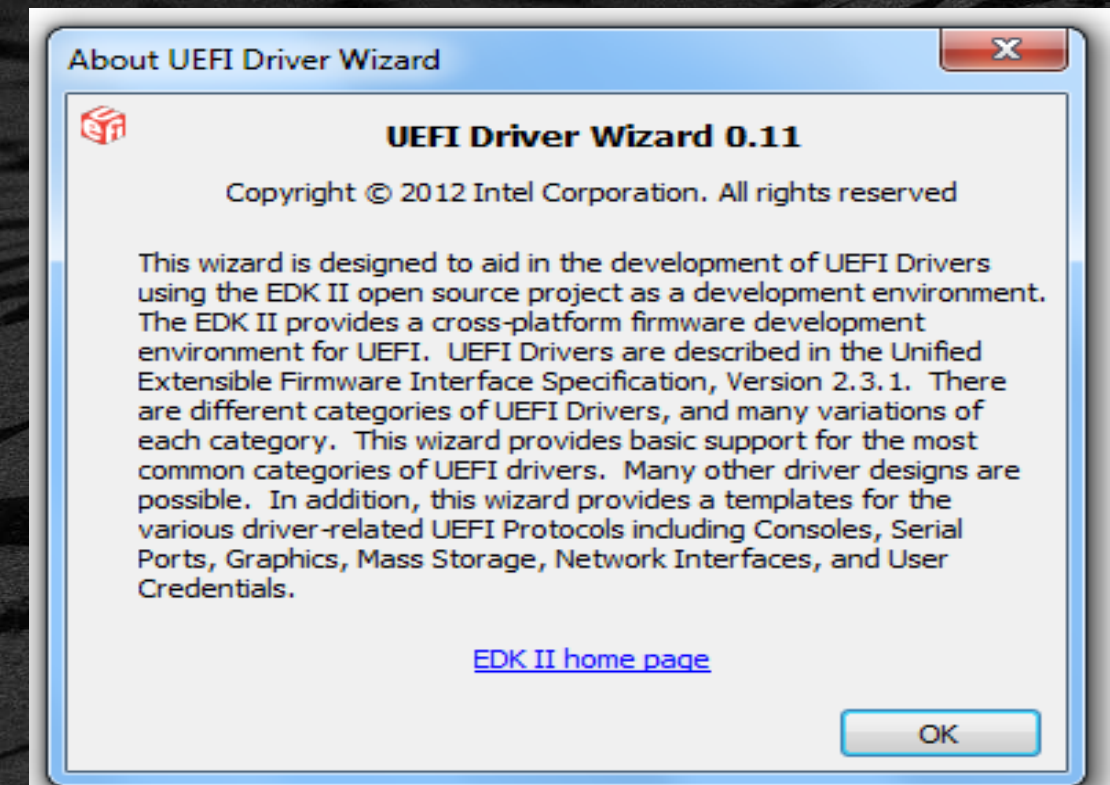
- ✱ Setup the UEFI Driver Wizard
- ✱ Create a UEFI Driver Template

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
- Byte stream device (i.e. UART / Serial I/O)
- Option to produce HII strings & forms for setup

Template File Contents

Proper UEFI driver entry point

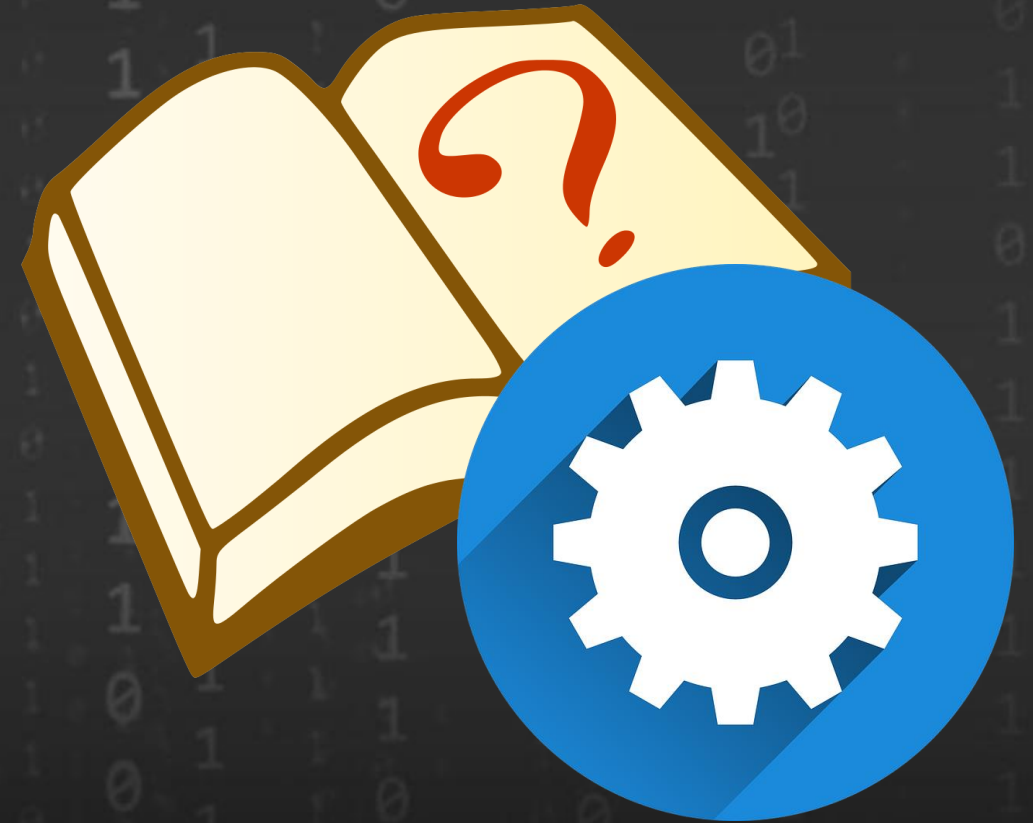
Basic driver libraries/headers

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



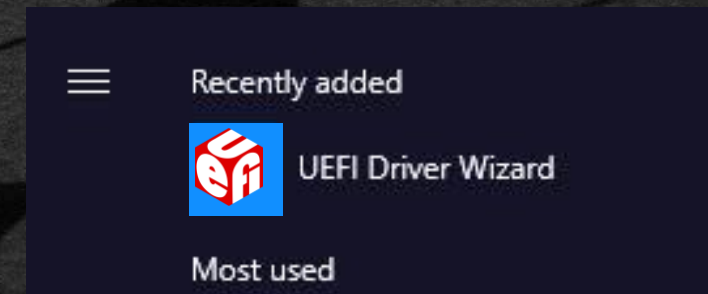
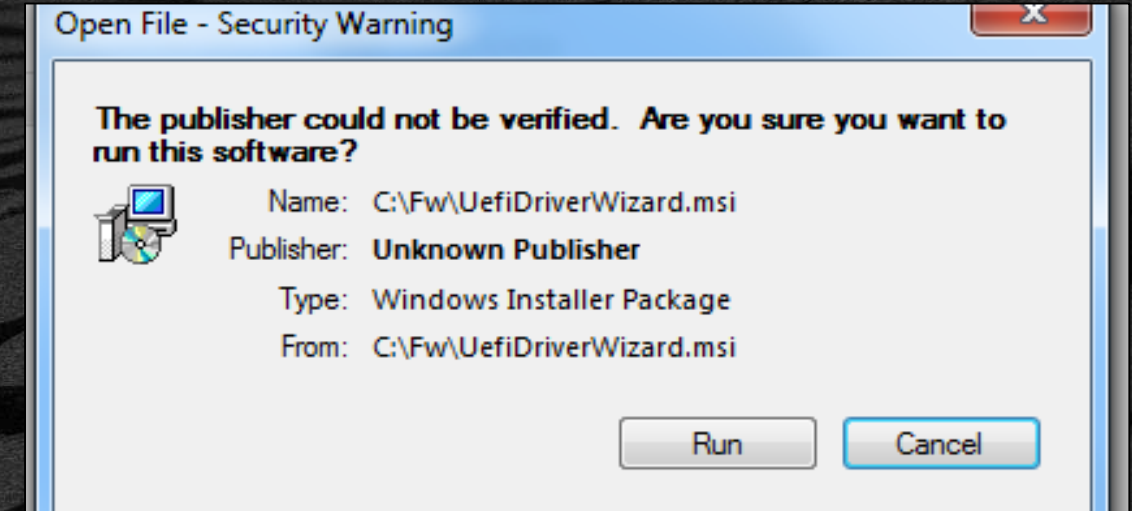
Lab 1: Install UEFI Driver Wizard

First setup for Building EDK II for Emulator, 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

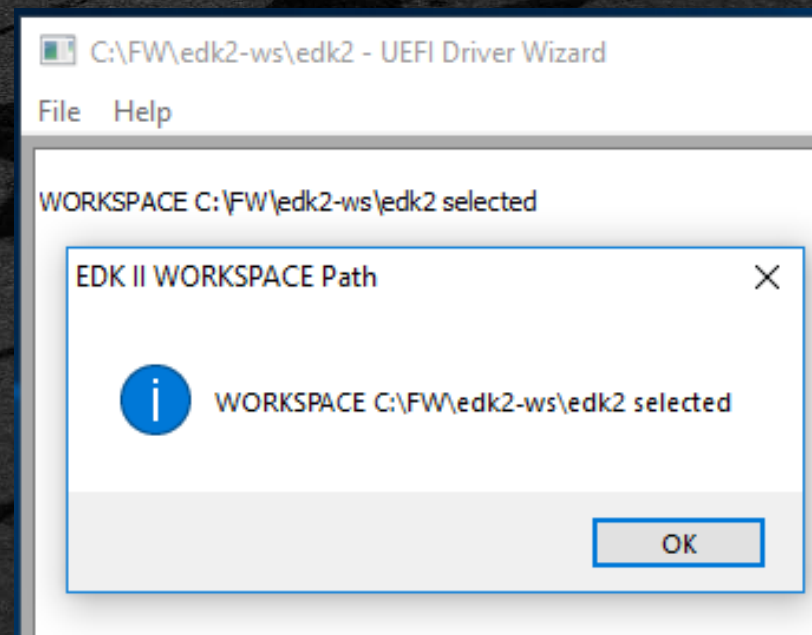
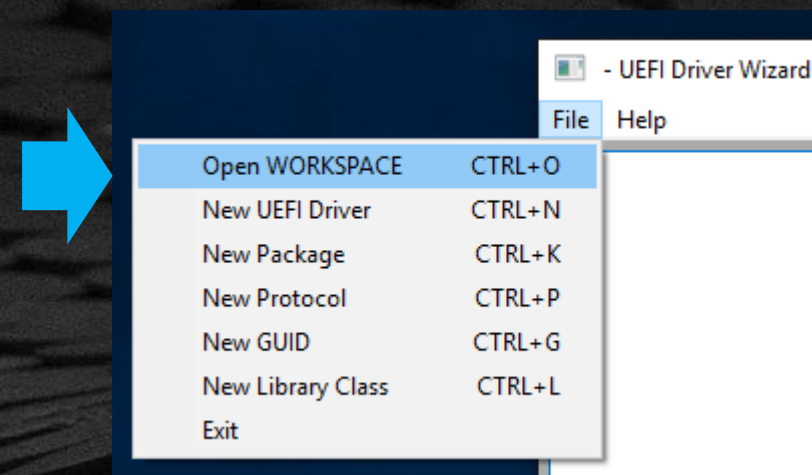
Browse to C:/FW/edk2-ws/edk2

Select “OK”

Should say

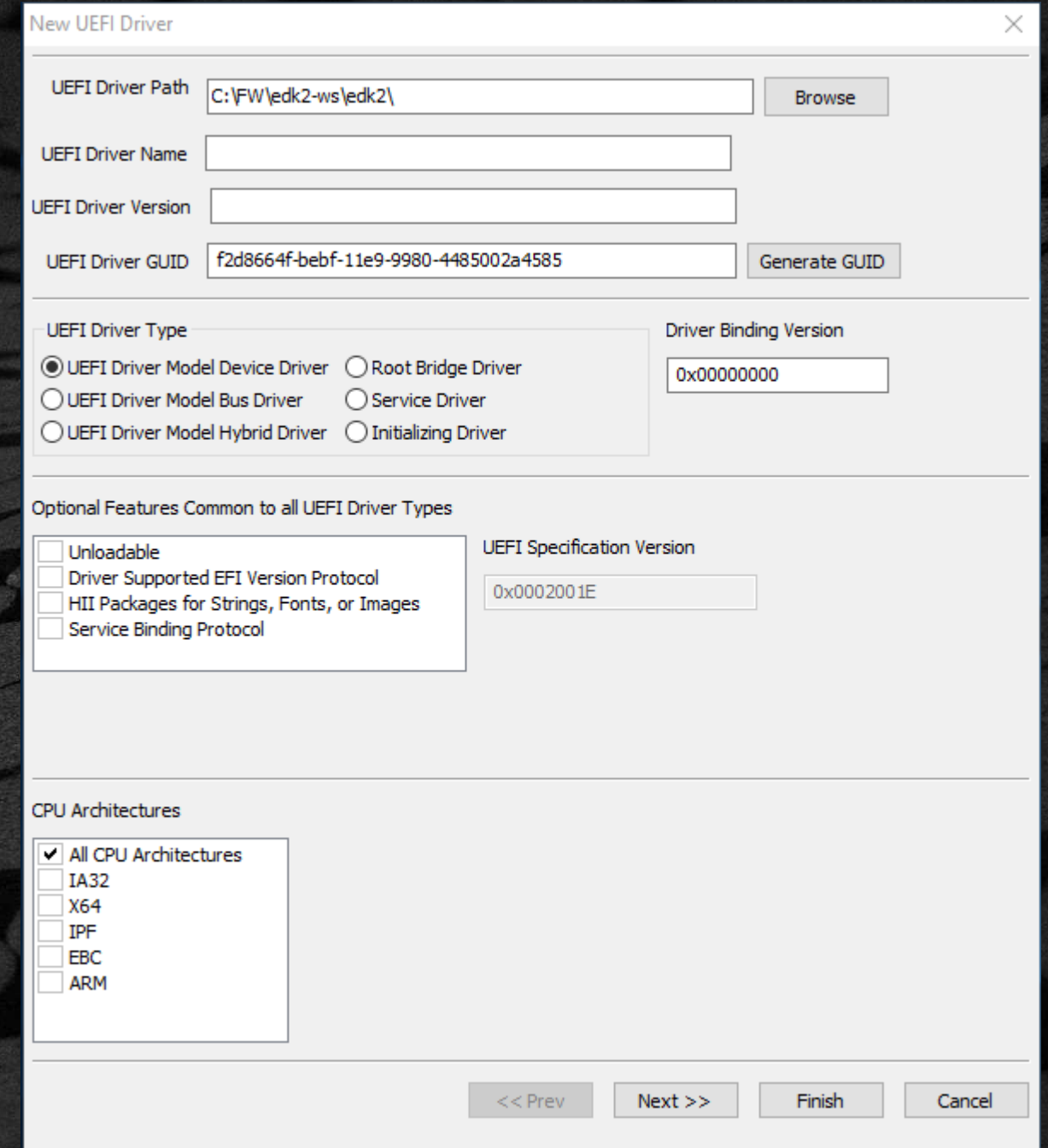
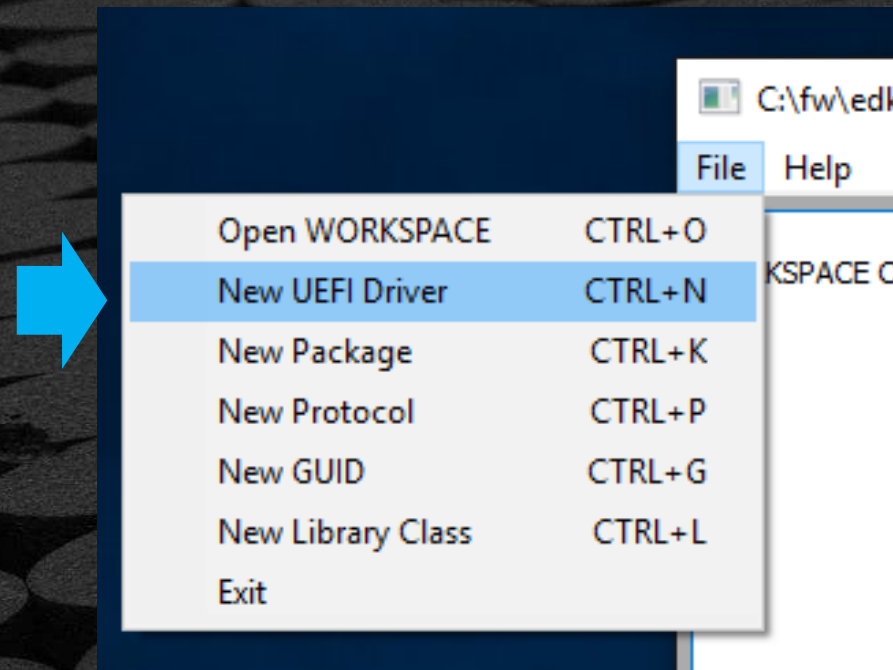
“WORKSPACE C:\FW\edk2-ws\edk2 selected”

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



Lab 1: Create a New UEFI Driver

Control+N – to Open Menu

A screenshot of the 'New UEFI Driver' dialog box. The dialog contains several fields and sections:

- UEFI Driver Path:** C:\FW\edk2-ws\edk2\ (with a 'Browse' button)
- UEFI Driver Name:** (empty text field)
- UEFI Driver Version:** (empty text field)
- UEFI Driver GUID:** f2d8664f-bebf-11e9-9980-4485002a4585 (with a 'Generate GUID' button)
- UEFI Driver Type:** Radio buttons for 'UEFI Driver Model Device Driver' (selected), 'UEFI Driver Model Bus Driver', 'UEFI Driver Model Hybrid Driver', 'Root Bridge Driver', 'Service Driver', and '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', and 'Service Binding Protocol'.
- UEFI Specification Version:** 0x0002001E
- CPU Architectures:** Checkboxes for 'All CPU Architectures' (checked), 'IA32', 'X64', 'IPF', 'EBC', and 'ARM'.

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

Lab 1: New UEFI Driver Menu

- UEFI Driver Path” – Type: “MyWizardDriver”

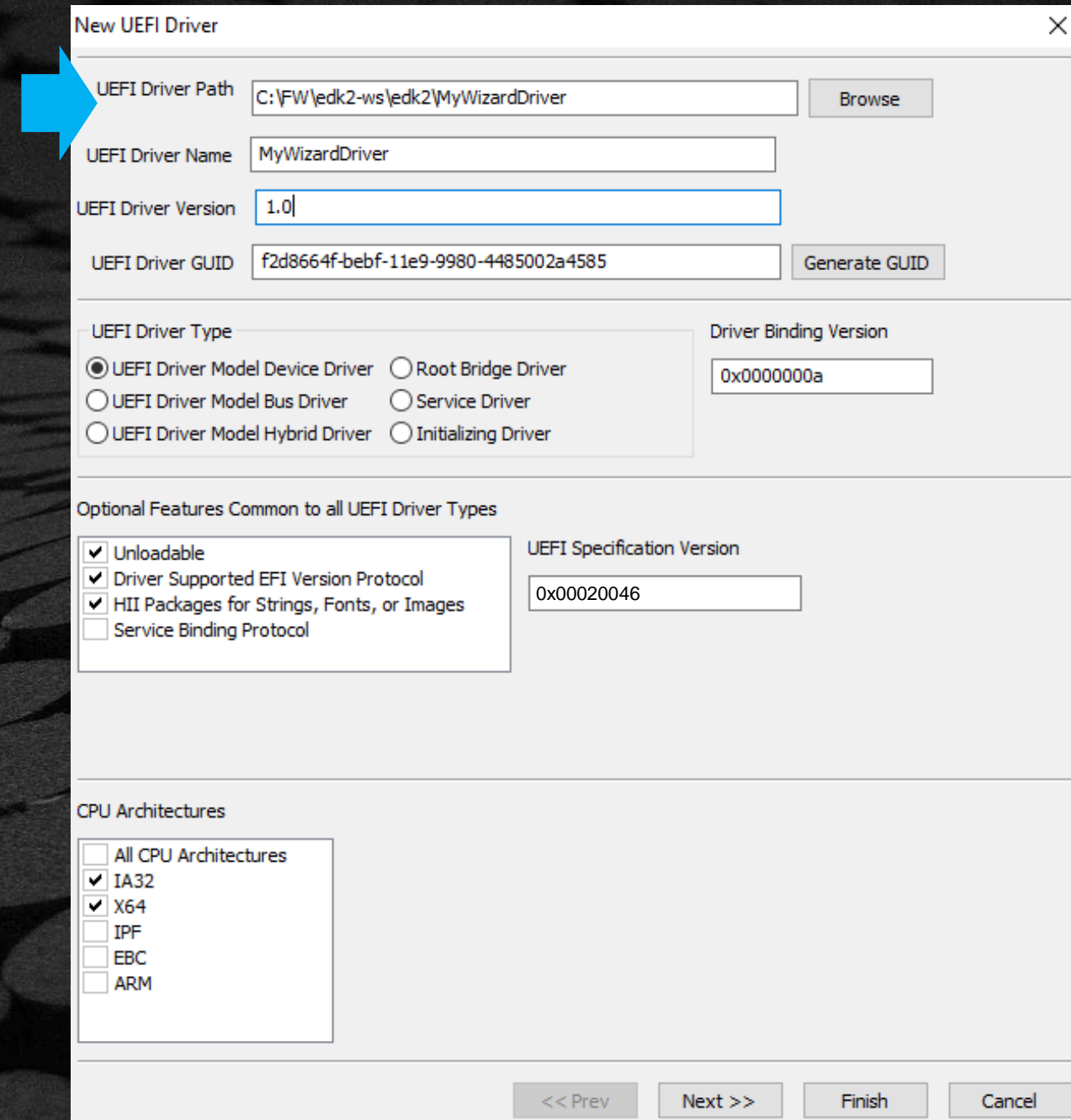
Note: “UEFI Driver Name” is filled in.

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

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

Click

Next >>



The screenshot shows the 'New UEFI Driver' dialog box with the following fields and options:

- UEFI Driver Path:** C:\FW\edk2-ws\edk2\MyWizardDriver (with a blue arrow pointing to it)
- UEFI Driver Name:** MyWizardDriver
- UEFI Driver Version:** 1.0
- UEFI Driver GUID:** f2d8664f-bebf-11e9-9980-4485002a4585 (with a 'Generate GUID' button)
- UEFI Driver Type:**
 - ☒ 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:** 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:** 0x00020046
- CPU Architectures:**
 - ☐ All CPU Architectures
 - ☒ IA32
 - ☒ X64
 - ☐ IPF
 - ☐ EBC
 - ☐ ARM

Navigation buttons at the bottom: << Prev, Next >>, Finish, Cancel.

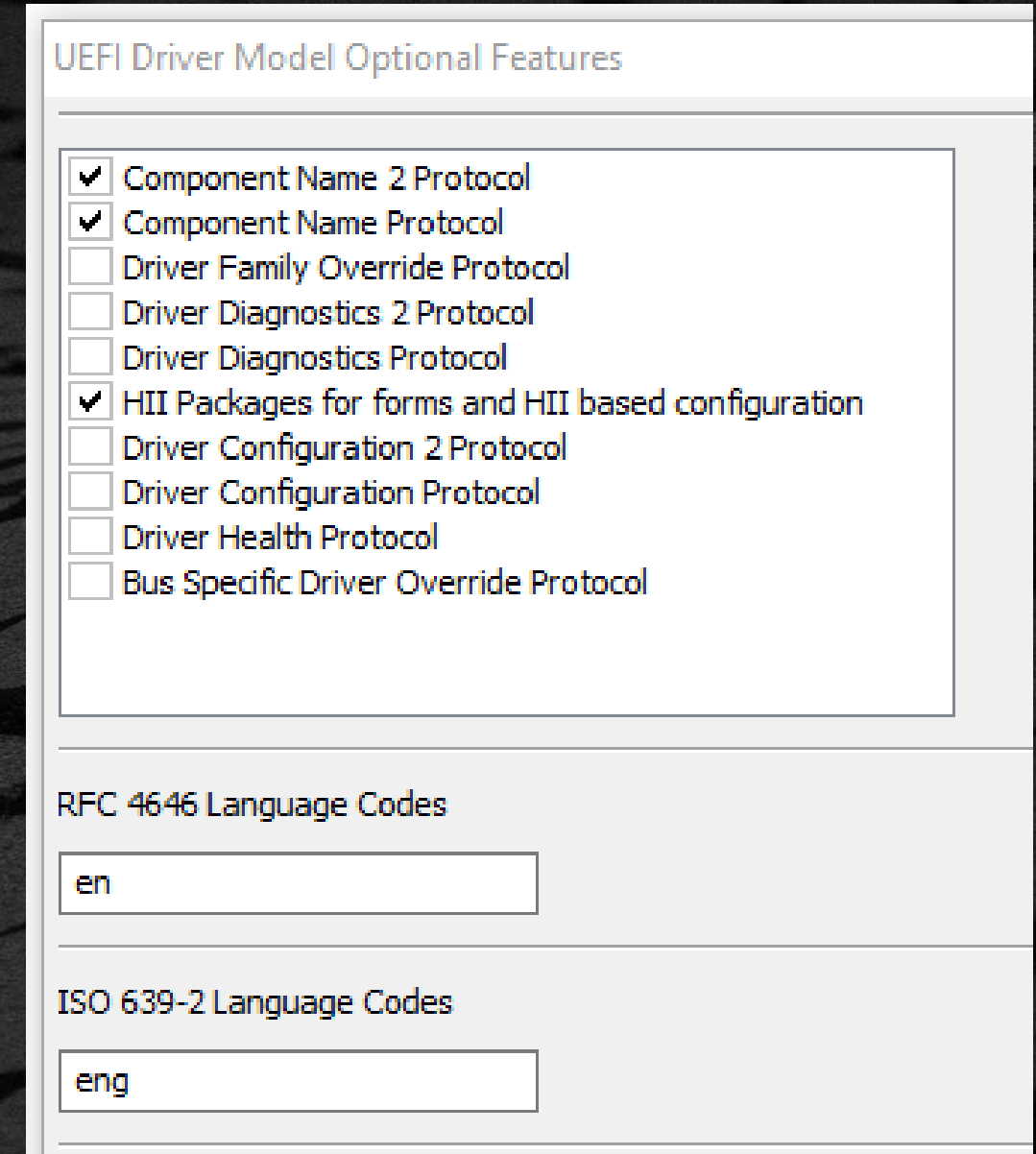
Lab 1: UEFI Driver Model Optional Features

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".

UEFI Driver Model Optional Features	
<input checked="" type="checkbox"/>	Component Name 2 Protocol
<input checked="" type="checkbox"/>	Component Name Protocol
<input type="checkbox"/>	Driver Family Override Protocol
<input type="checkbox"/>	Driver Diagnostics 2 Protocol
<input type="checkbox"/>	Driver Diagnostics Protocol
<input checked="" type="checkbox"/>	HII Packages for forms and HII based configuration
<input type="checkbox"/>	Driver Configuration 2 Protocol
<input type="checkbox"/>	Driver Configuration Protocol
<input type="checkbox"/>	Driver Health Protocol
<input type="checkbox"/>	Bus Specific Driver Override Protocol

RFC 4646 Language Codes

en

ISO 639-2 Language Codes

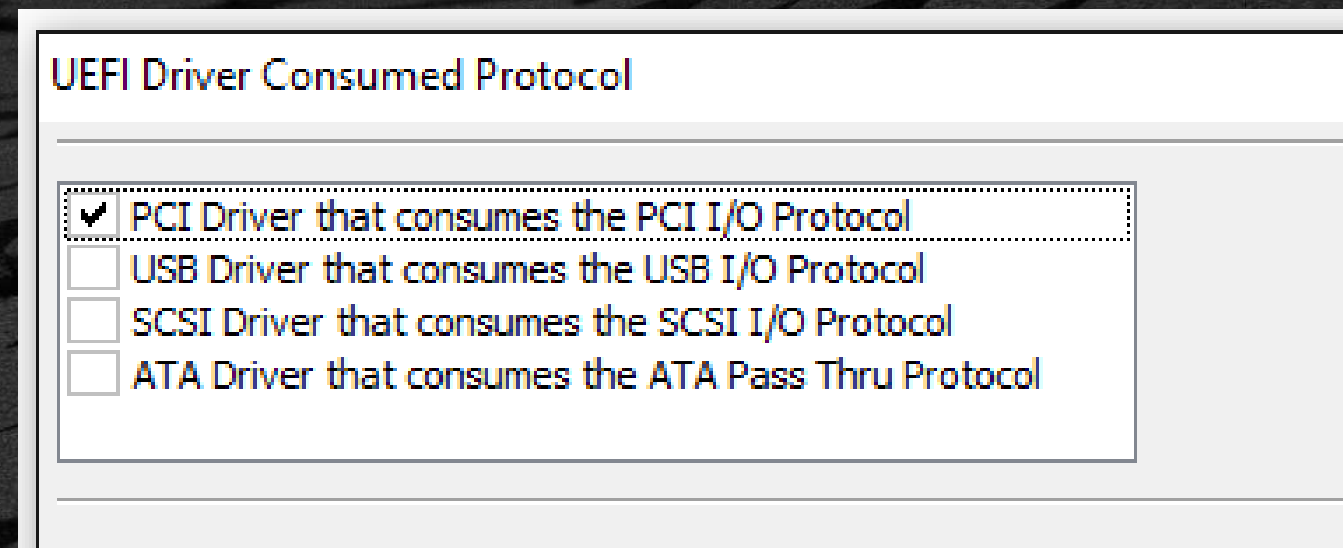
eng

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 >>

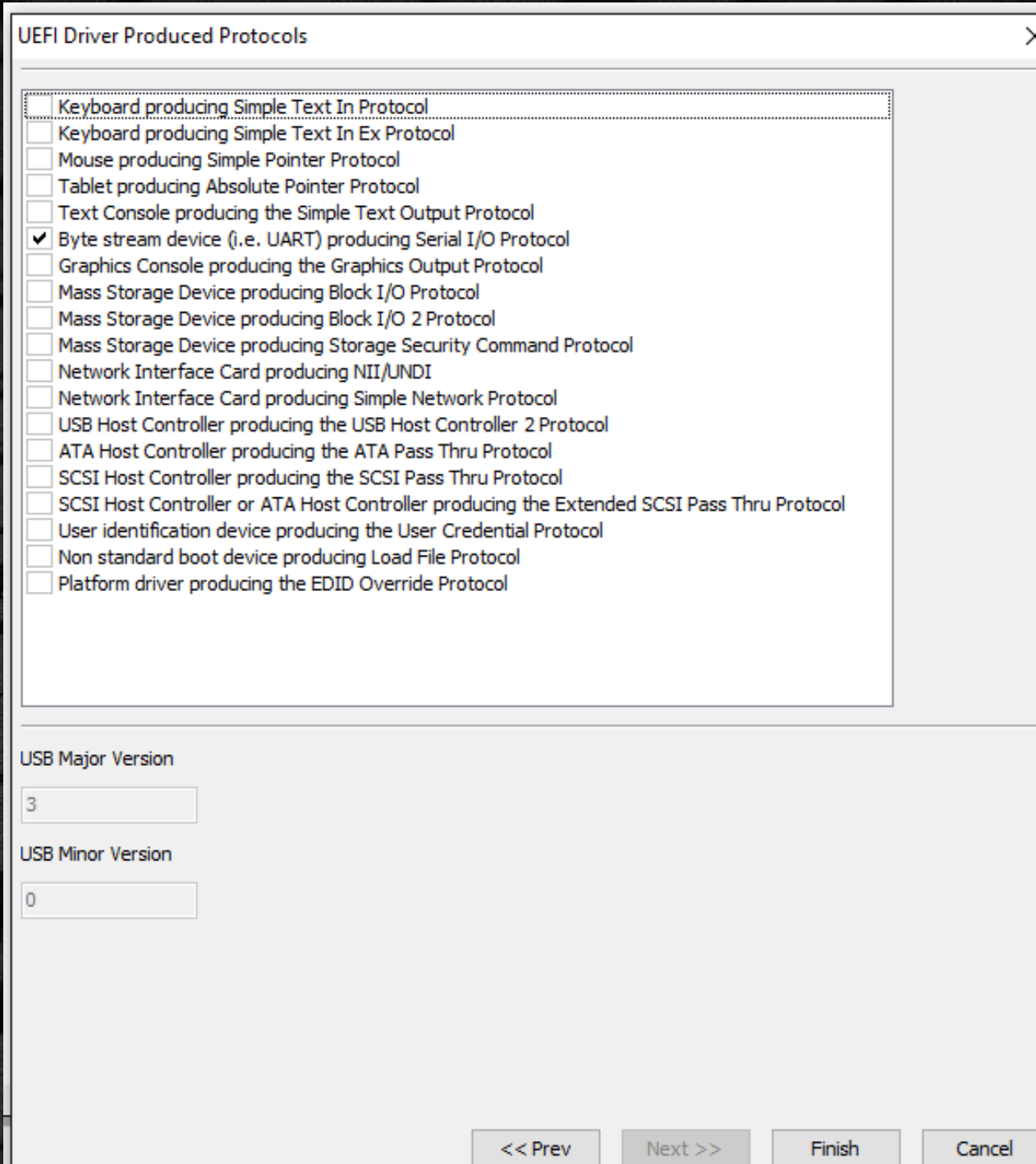
Lab1: UEFI Driver Produced Protocols

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

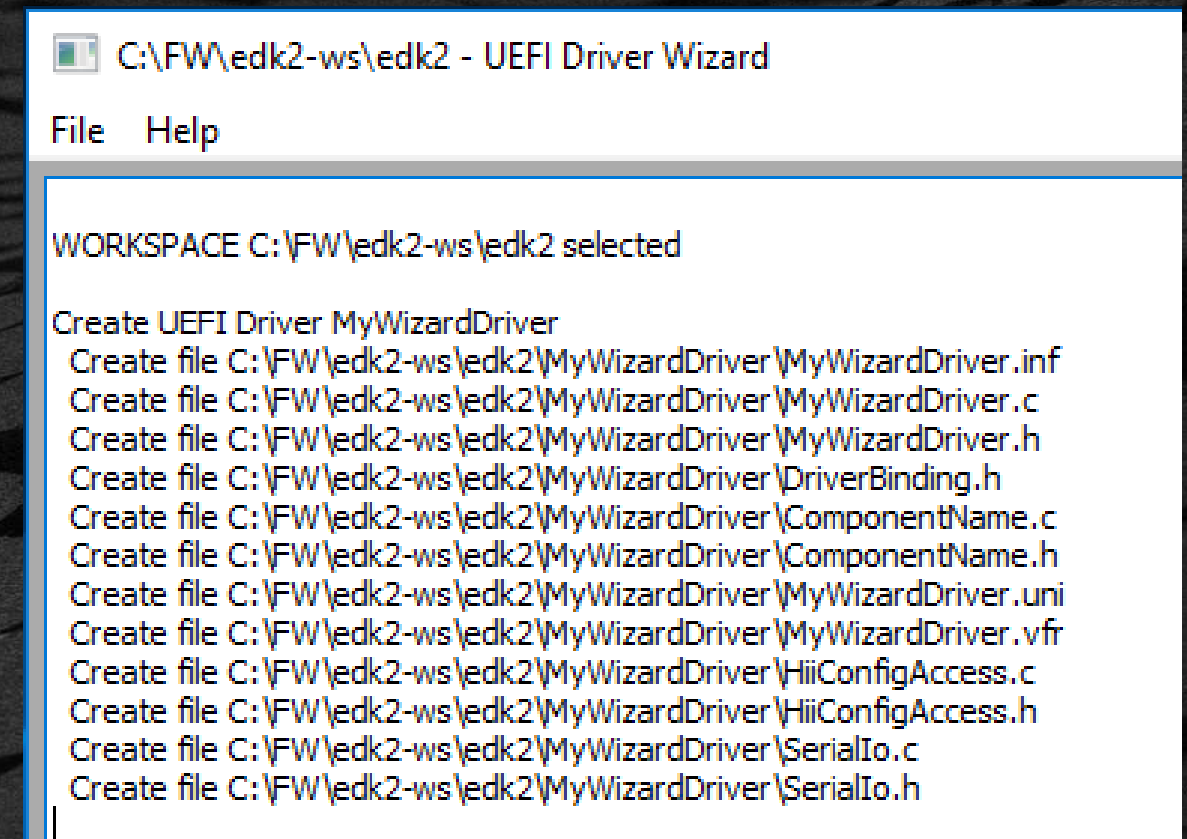
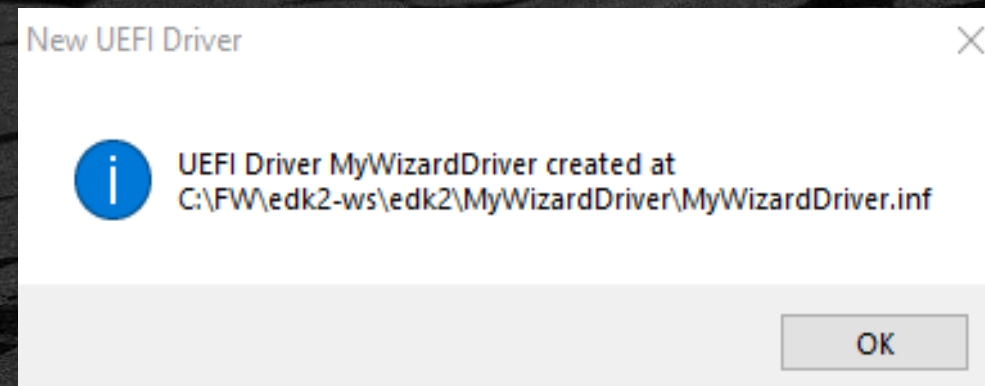
USB Major Version
3

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?



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