

UEFI & EDK II Training

UEFI Driver Wizard Lab - Windows

tianocore.org

LESSON OBJECTIVE

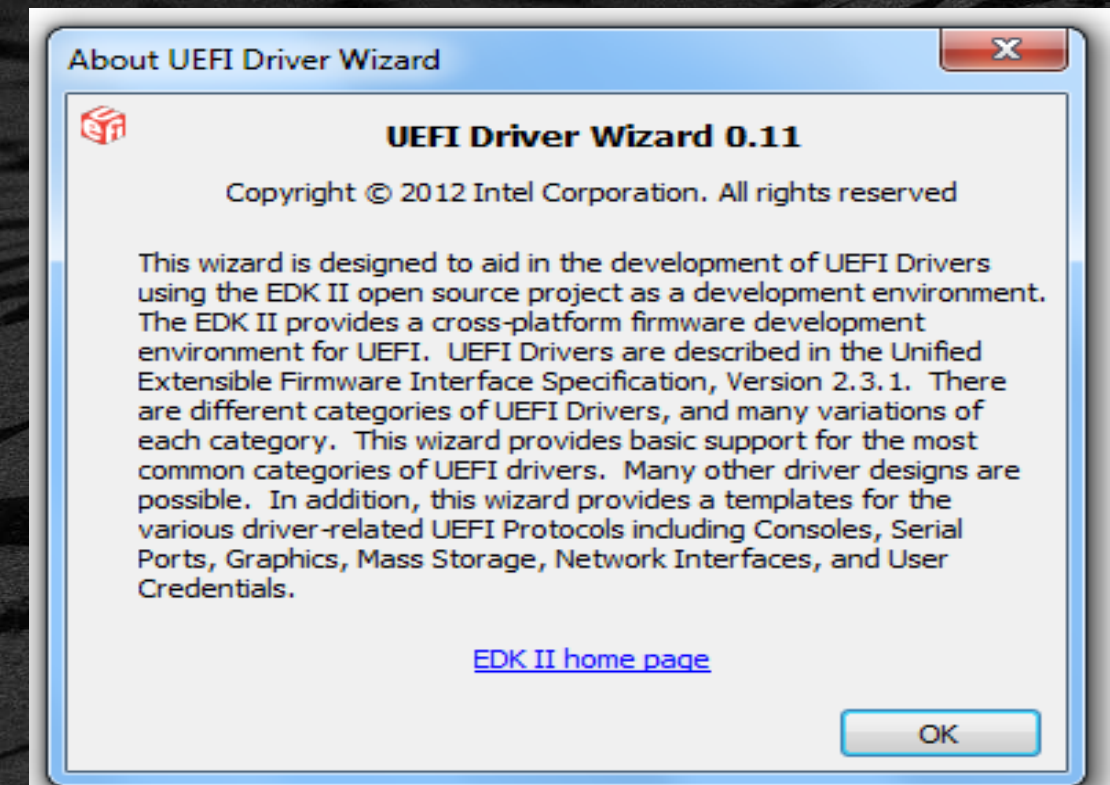
- ✿ Setup the UEFI Driver Wizard
- ✿ Create a UEFI Driver Template

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

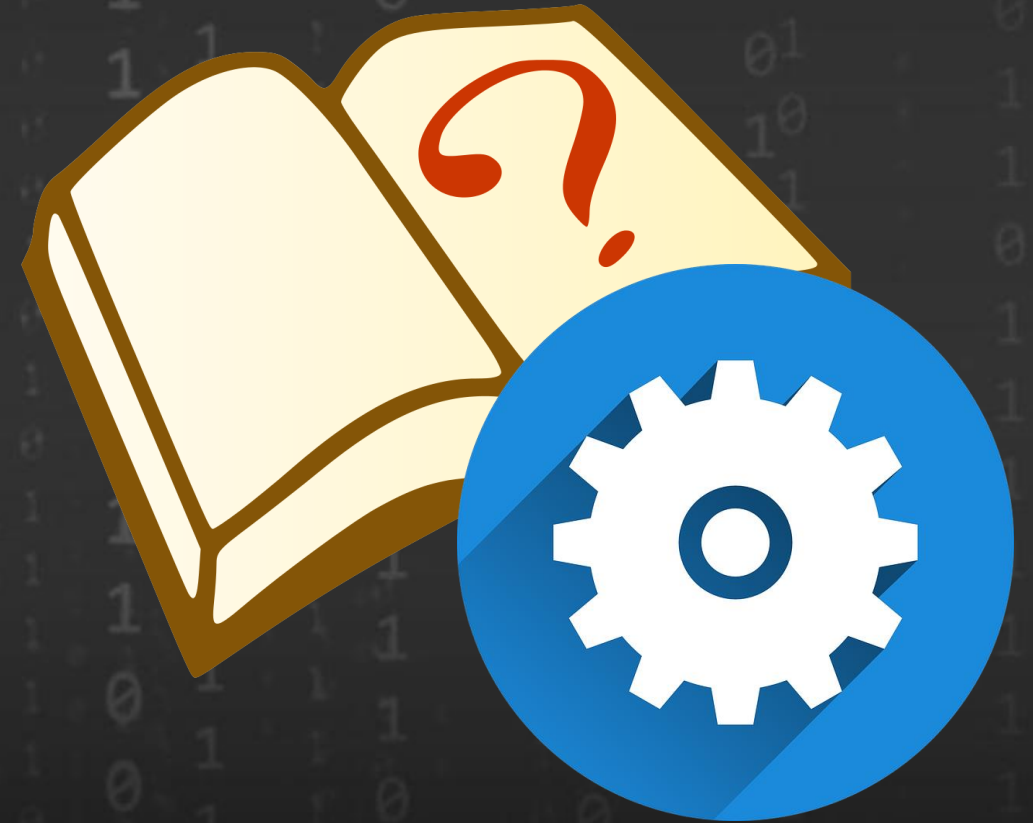
Basic driver libraries/headers

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



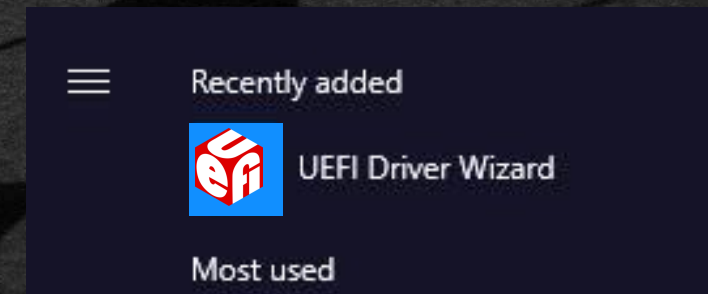
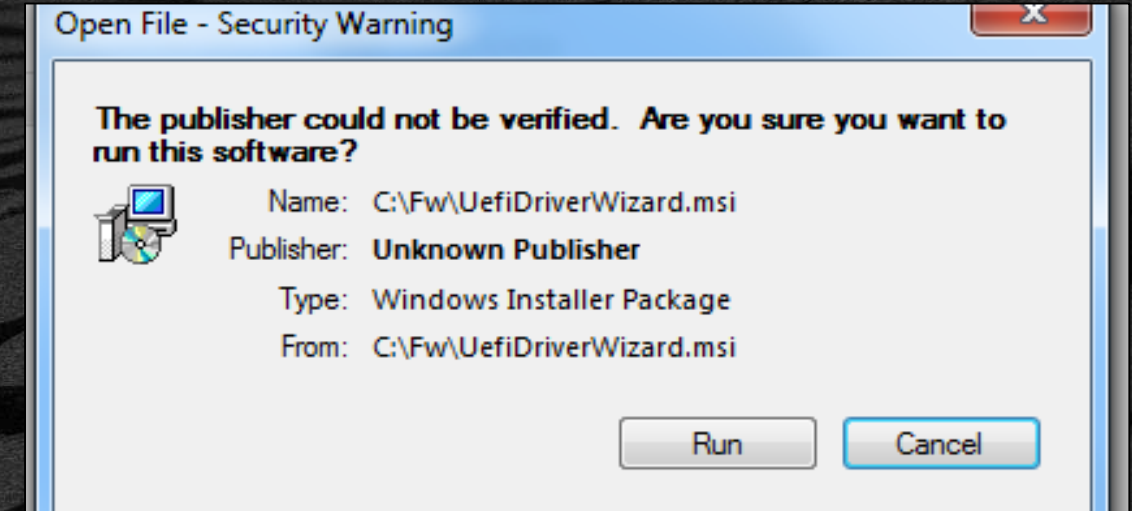
Lab 1: Install UEFI Driver Wizard

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

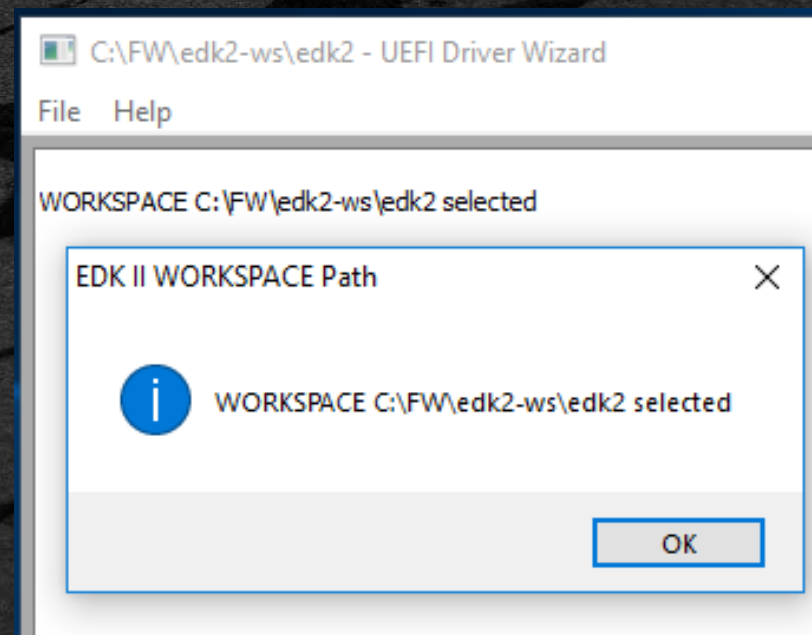
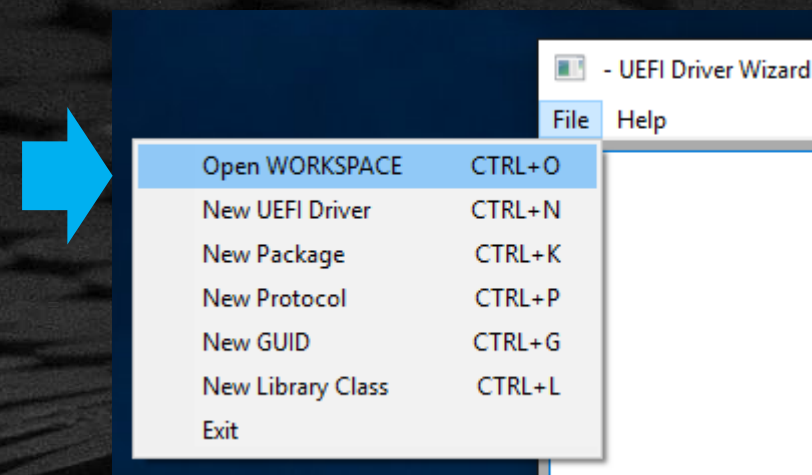
Browse to C:/FW/edk2-ws/edk2

Select “OK”

Should say

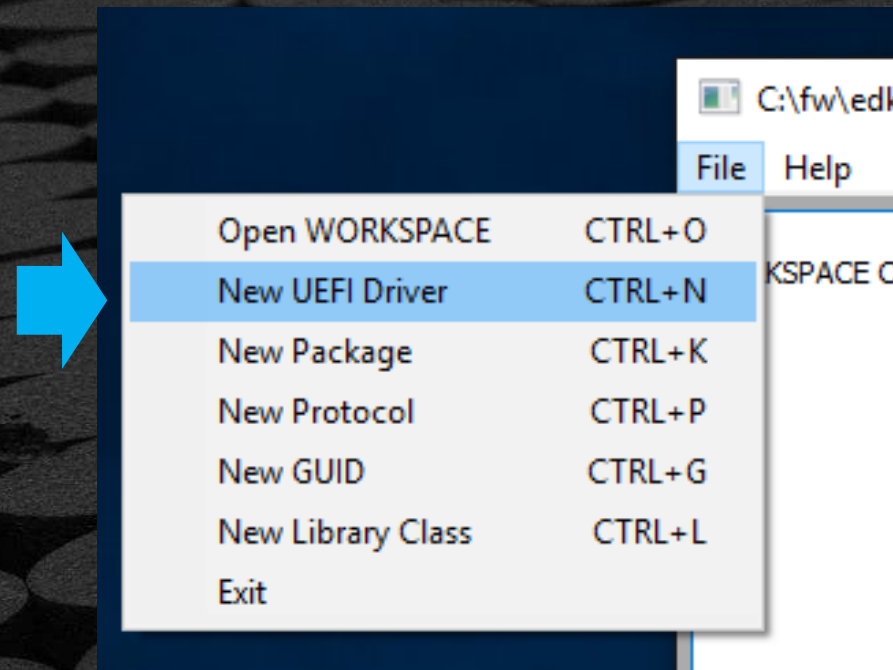
“WORKSPACE C:\FW\edk2-ws\edk2 selected”

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



Lab 1: Create a New UEFI Driver

Control+N – to Open Menu



New UEFI Driver

UEFI Driver Path:

UEFI Driver Name:

UEFI Driver Version:

UEFI Driver GUID:

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:

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:

CPU Architectures:

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

<< Prev Next >> Finish Cancel

Lab 1: New UEFI Driver Menu

- UEFI Driver Path” – Type: “MyWizardDriver”

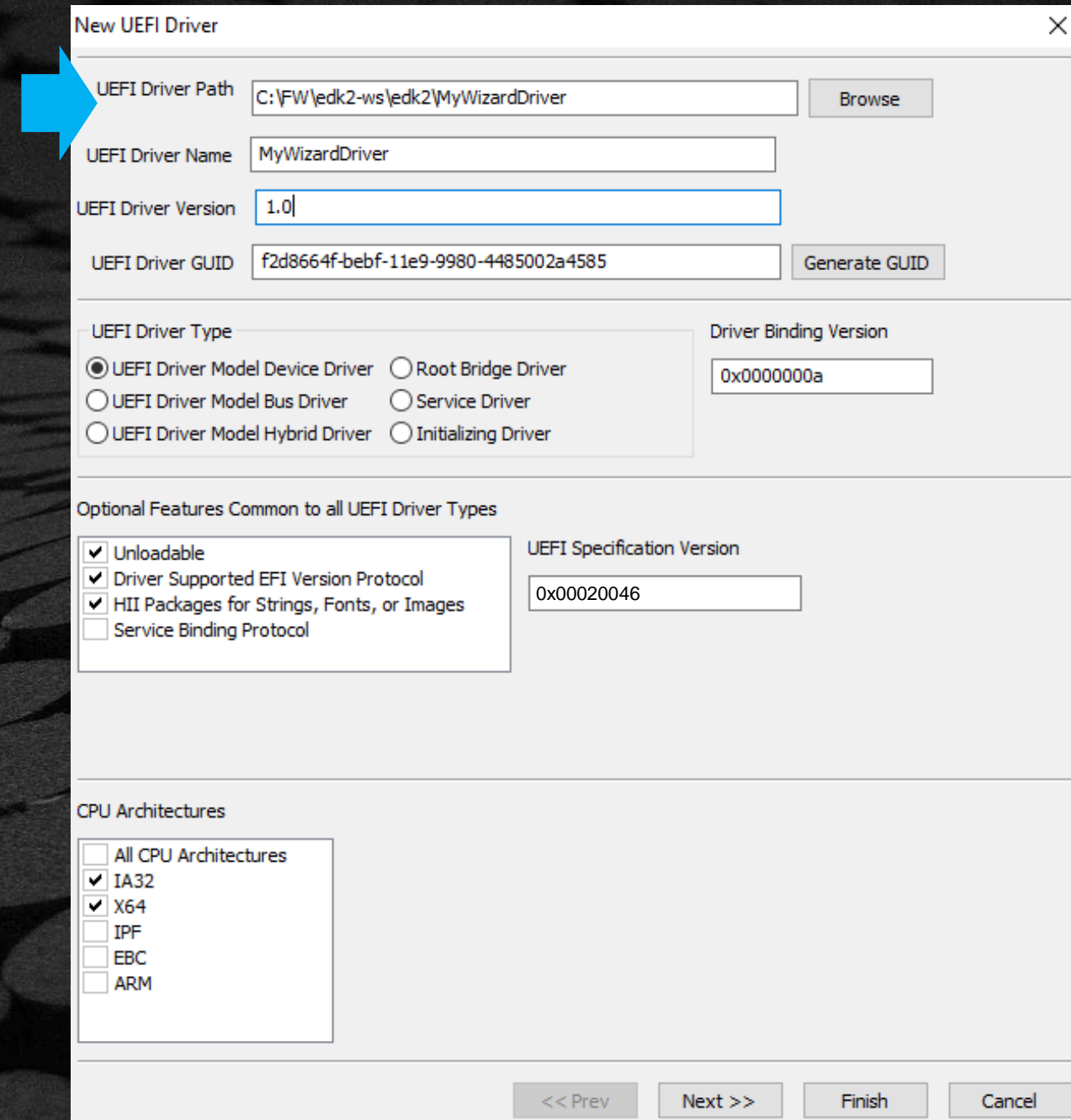
Note: “UEFI Driver Name” is filled in.

- **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 'Browse' button)
- 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.

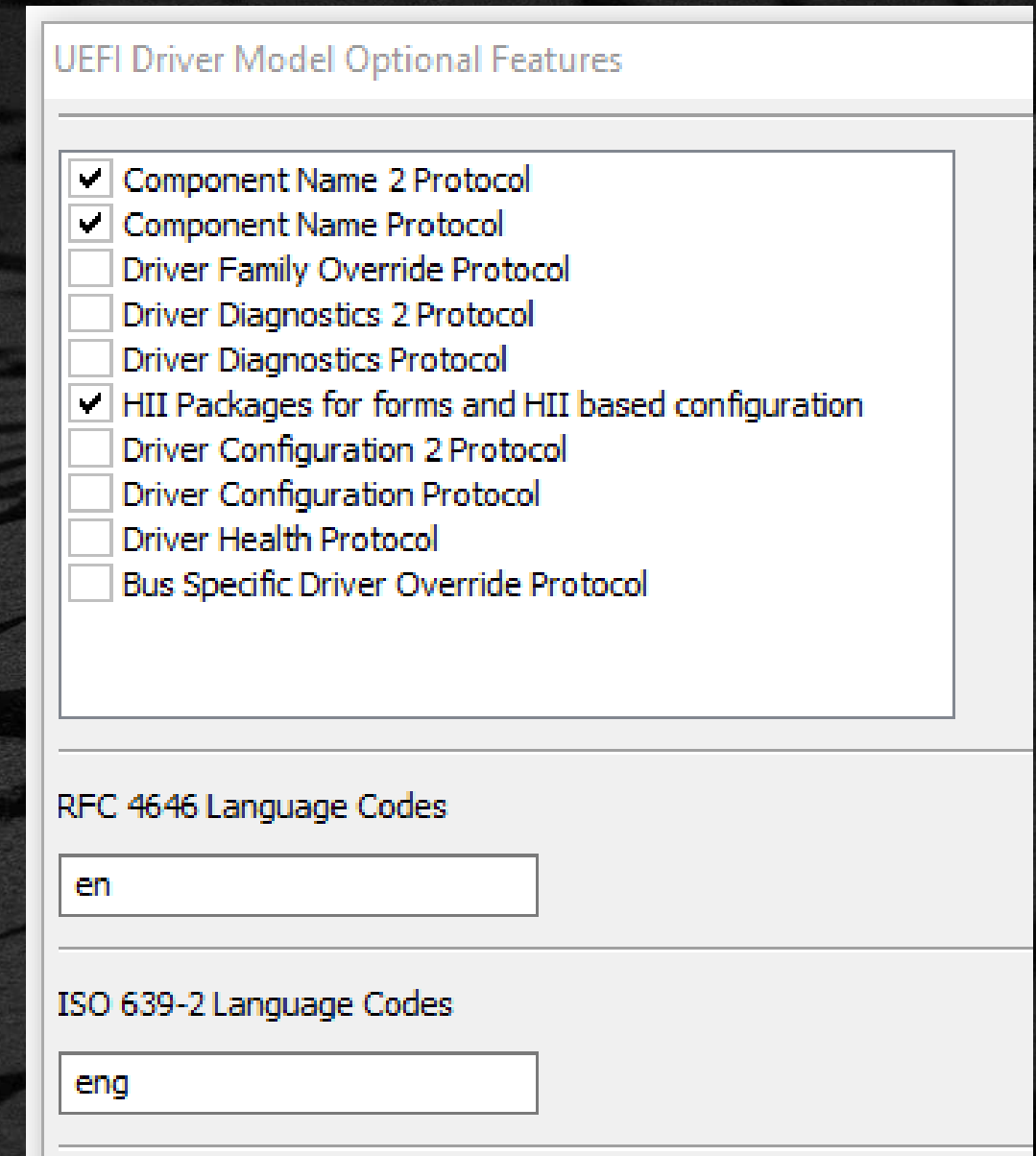
Lab 1: UEFI Driver Model Optional Features

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 first three are checked: "Component Name 2 Protocol", "Component Name Protocol", and "HII Packages for forms and HII based configuration". The other five 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 this list 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

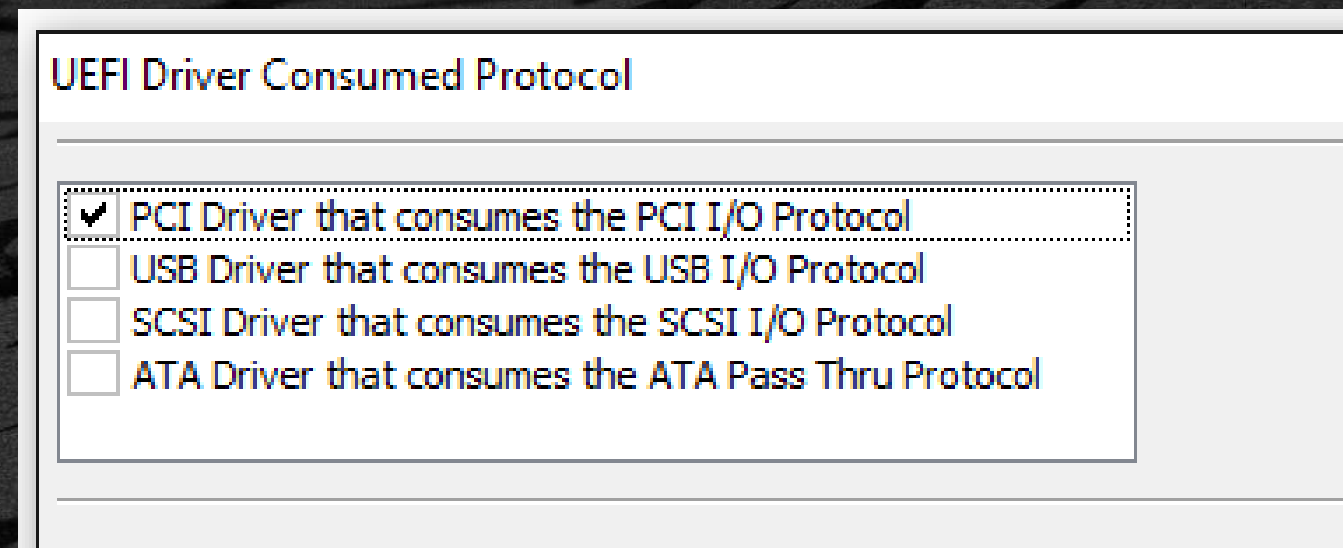
eng

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 >>

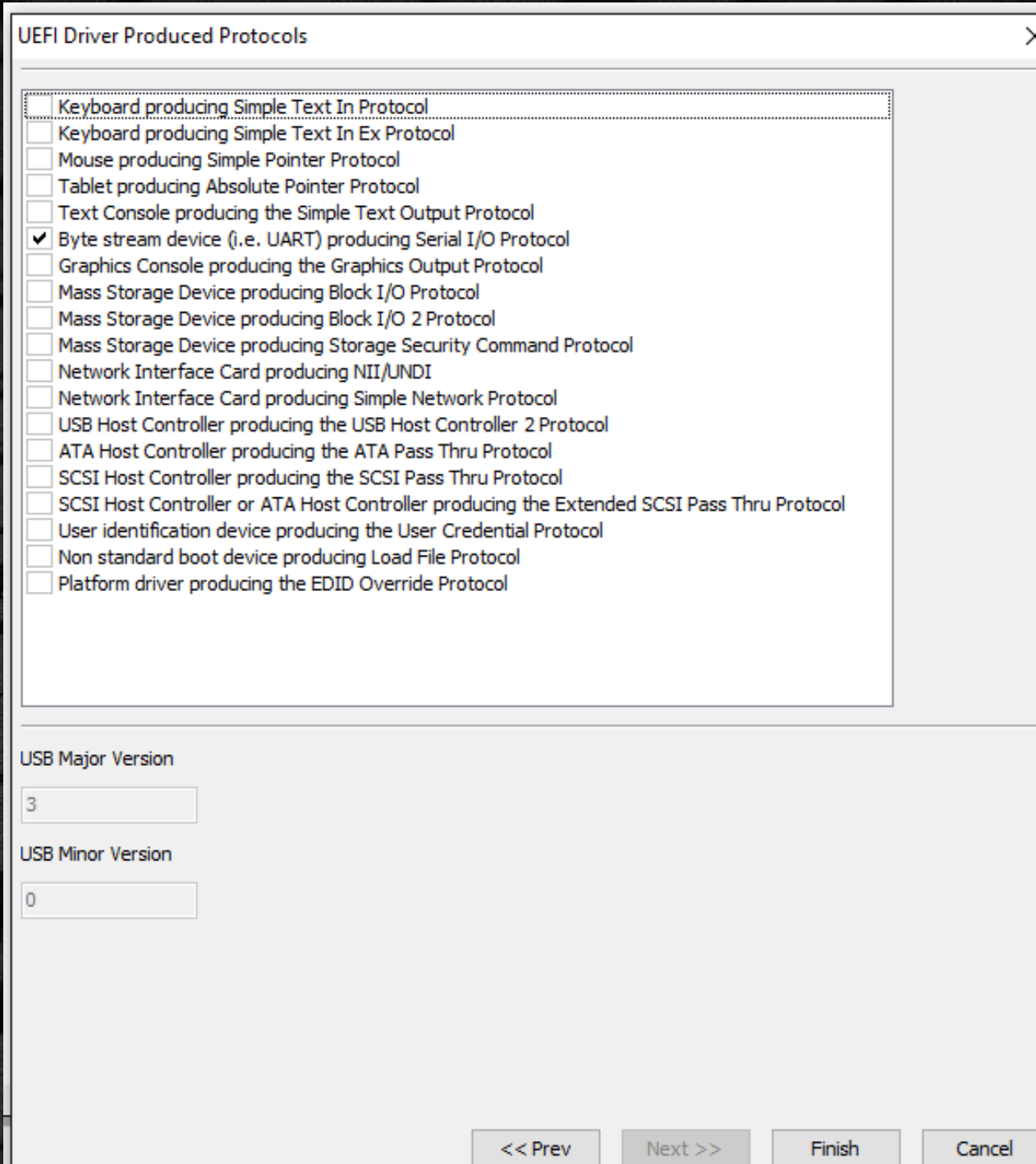
Lab1: UEFI Driver Produced Protocols

Select

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

Click

Finish



The screenshot shows a window titled "UEFI Driver Produced Protocols" with a list of protocols and their checkboxes. The "Byte stream device (i.e. UART) producing Serial I/O Protocol" checkbox is checked. Below the list are input fields for "USB Major Version" (3) and "USB Minor Version" (0). At the bottom are navigation buttons: "<< Prev", "Next >>", "Finish", and "Cancel".

Protocol	Selected
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	

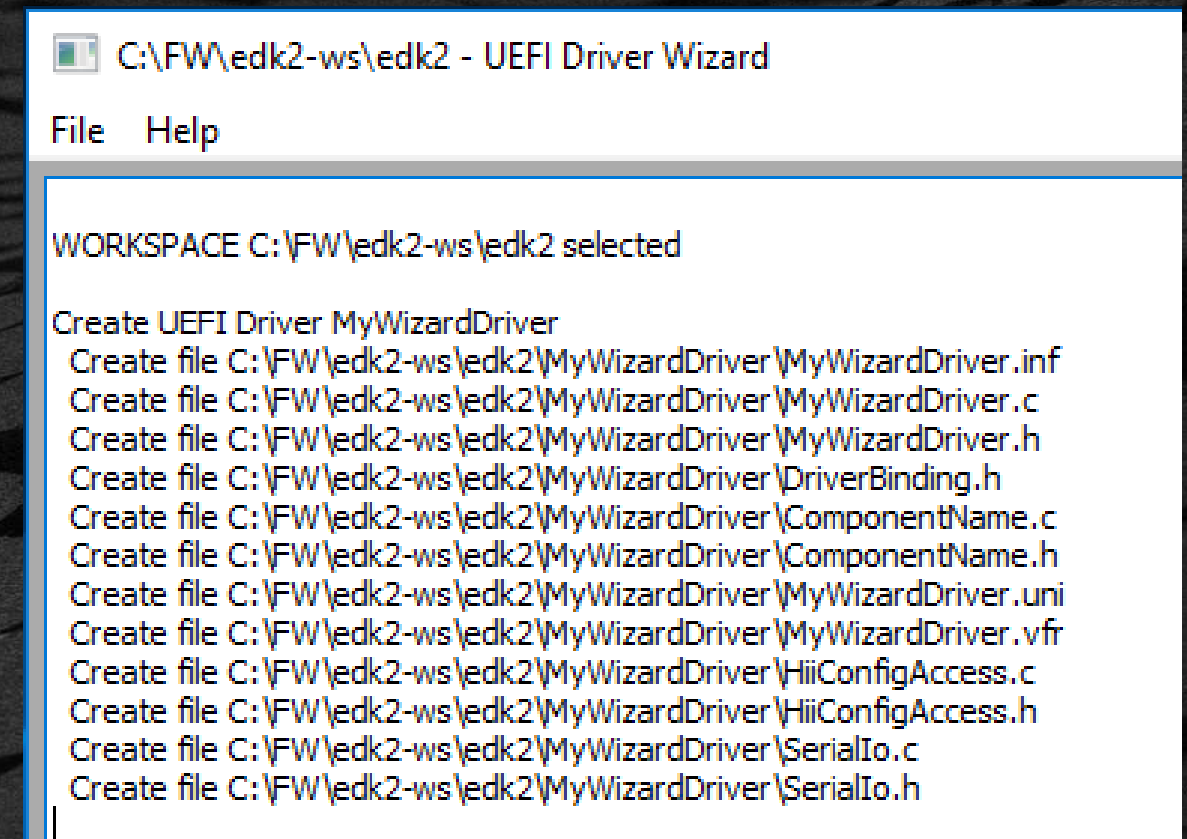
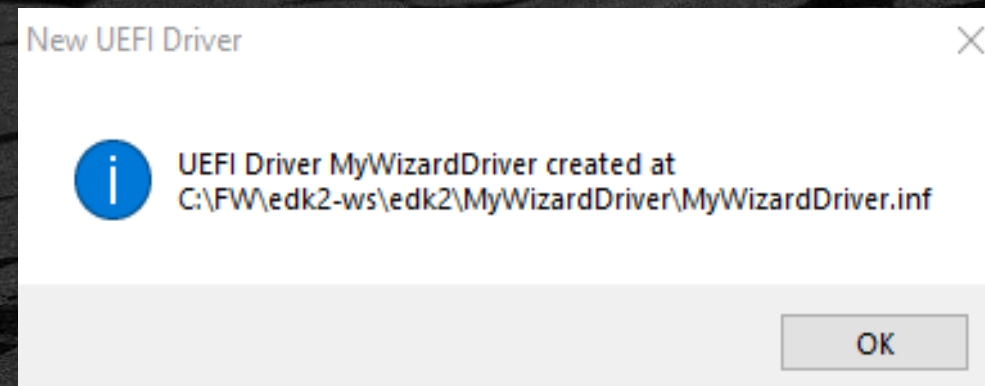
USB Major Version: 3

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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