

Quartus on macOS

ECE 272: Digital Logic Design Laboratory

Introduction

This document contains instructions describing how to use Quartus design software on macOS using the VMware Fusion virtual machine tool. The Quartus software is not available on macOS. As such, you need to install the Windows operating system on your Mac. There are two methods to do this. The first is in a virtual machine (described here). A virtual machine runs Windows as an application within macOS. The advantage of this is that you will not have to partition (section off part of) your hard drive for use by Windows, meaning that your entire disk space is still accessible to macOS should you need it. This method is suggested if you do not have a lot of extra space on your hard drive or if you do not plan on using the Windows virtual machine extensively.

The second method is to dual-boot your laptop using Boot Camp. This method splits your hard drive into two parts: one for macOS and one for Windows. The division cannot be changed without fully deleting the Windows side, so you will need reserve all the space you could potentially need when you set it up. This also generally requires much more space to be set aside for the Windows boot (30-60 GB) than is needed for a virtual machine. This method will run faster than a virtual machine and is suggested if you will be using Windows extensively and have ample space on your hard drive. For assistance with Boot Camp, please visit the College of Engineering Computer Help Desk on the first floor of Dearborn Hall.

Instructions

1. Download & Install VMware Fusion 10

Visit <https://it.engineering.oregonstate.edu/obtain-software-your-personal-computer-or-laptop> and select VMware Academic Program. Click on the link provided and, after logging in with your ONID information, select VMware Fusion 10 from the list of products.

Choose Add to Cart and click Checkout. Copy down the serial number given - you will need this in the next step.

Download the program and run the installer. When prompted, enter the serial number where you are asked for "license key".

2. Download Microsoft Windows

Visit <https://it.engineering.oregonstate.edu/obtain-software-your-personal-computer-or-laptop> and select Azure Dev Tools. Click on the link provided and, after logging in with your ONID information, search for Windows 10 Education Edition. There will be a download button and a view key button.

Choose Add to Cart. Copy down the product key given - you will need this in the next step.

Download the 64-bit version and save the .iso file.

3. Install Microsoft Windows

Open VMware Fusion and drag the Windows .iso file you downloaded to the “install from disc or image” area. Enter the Windows product key when prompted and select Windows 10 Education (fig. 1). Click Continue.

Microsoft Windows Easy Install

With Easy Install, VMware Fusion will use the information provided here to automatically install Windows 10 x64 from your installation disc and install drivers to optimize your virtual machine.

Choose Disc or Image Configuration Finish

Use Easy Install

Account Name: Kevin Bishop

Account Type: Administrator

Password: (optional)

Confirm Password:

Windows Product Key: 38DQN-W7JW9-4PH26-W76K3-C37YY

Language: English (United States)

Windows 10 Education

? Cancel Go Back Continue

Figure 1

Select “more isolated” and save the setup to “virtual machines” (the default option).

The virtual machine should open and install Windows. This will take some time and the virtual machine may restart itself several times. You may also get an alert during installation if you do not have enough space on your hard drive - if so then delete some files (or transfer them to an external drive) and click continue. Finally, the VMware Fusion window may go black if an alert pauses the installation and you leave it for too long. This is fine - it is just the virtual machine going to sleep. Click in the VMware Fusion window to wake it up and continue the installation.

Once the installation is fully completed you may delete the .iso file.

4. Set Permanent MAC Address

Fully shut down the virtual machine (select the virtual machine window, Virtual Machine → Shutdown).

From the VMware Fusion menu bar, select Window → Virtual Machine Library.

Select the virtual machine and click the settings button (the wrench in the upper right corner).

Under Removable Devices in the settings window, select Network Adaptor and click Advanced options.

Click the Generate button next to the listed MAC address; the address in the text box should change. Use this newly generated address when you request a license in the next step. You can now close the settings window.

5. Install Quartus

Launch the virtual machine and follow the instructions in the lab manual

Once you have completed this, ensure that you can launch Quartus - you should reach the start screen with options to create a new project, open a project, etc. If you get a licensing error, double check that you completed the licensing steps above correctly.

6. Install Drivers

With the virtual machine running, plug in your De10-Lite board using the cable provided. You should see a window like the one in fig. 2. Select Connect to Windows.

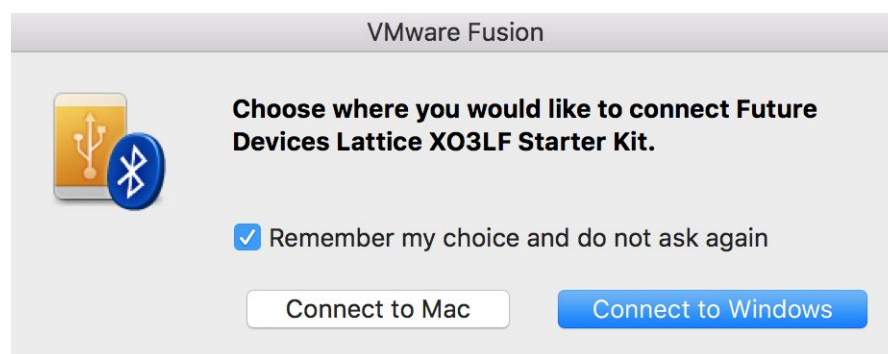


Figure 2

If you do not see a popup, from the VMware Fusion menu bar, select Virtual Machine → USB & Bluetooth → USB & Bluetooth Settings... In the window that opens, find the FPGA and in the Plug In Action column, select Connect to Windows from the dropdown menu (fig. 3).

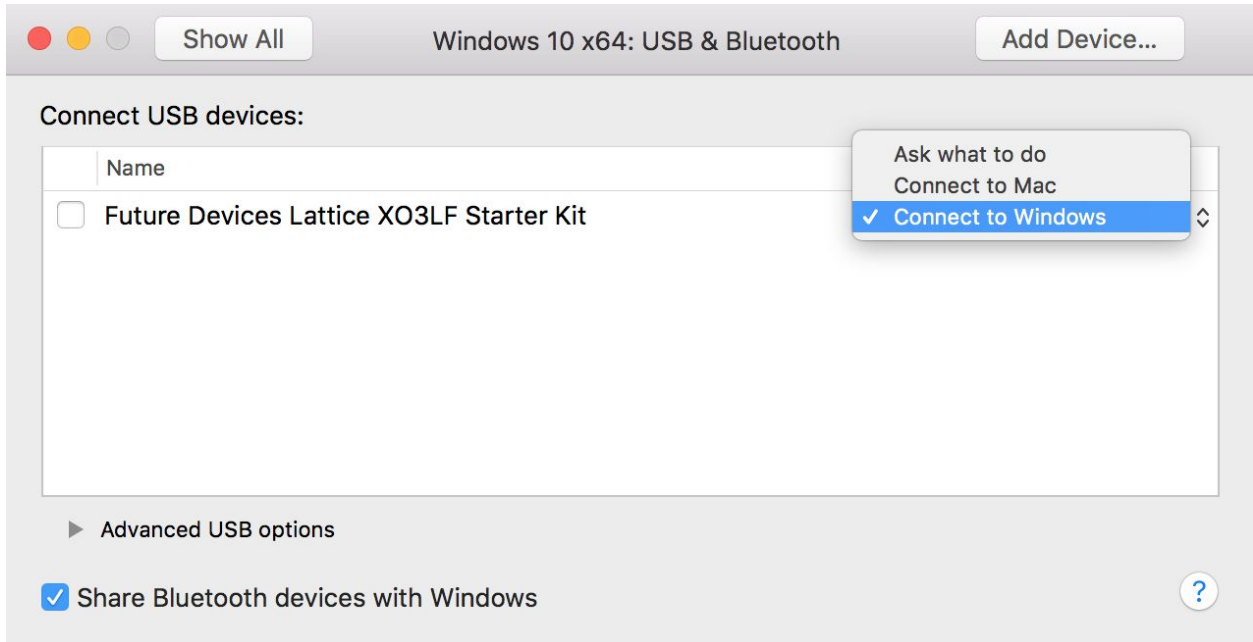


Figure 3

Open the Windows Device Manager by typing “device manager” into the Cortana search area in the lower left corner of the Windows desktop. Under other devices, you should see the USB blaster listed with a yellow flag next to it.

Right click on the device and select “Update Driver”.

In the popup window, select “Browse my computer for driver software” and browse to: C:\intelFPGA_lite\18\quartus\drivers. Check the “include subfolders” box and click next (fig. 4). The driver should install itself.

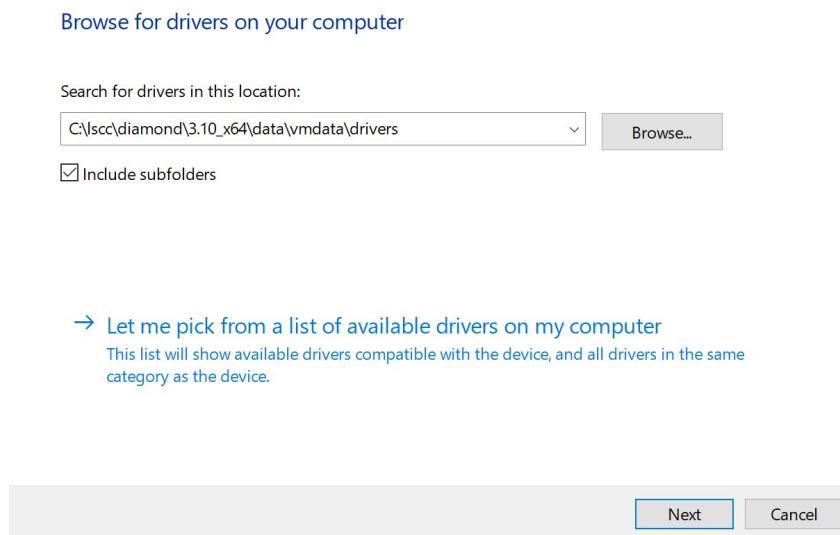


Figure 4

Note: When programming the board, you may get a programming failed error. If so, click detect cable on the right side of the screen and select the other USB port(s); then try programming again.

This guide has been adapted from the Lattice with Mac Document produced by Kevin Bishop.
Many thanks to kevin for all his hard work.