

Installation Instructions

Digital Design and Computer Architecture, Harris and Harris, © Elsevier, 2007

Xilinx WebPACK, ModelSim, SPIM, and Spartan 3E Board

Introduction

These instructions describe how to install the software and hardware needed to complete the labs associated with *Digital Design and Computer Architecture*, Harris and Harris, © Elsevier, 2007. The needed software is:

- Xilinx WebPACK
- ModelSim Xilinx Edition-III (MXE-III)
- SPIM, a MIPS Simulator

The CAD tools, Xilinx WebPACK and ModelSim, allow users to enter digital logic designs, as either schematic or HDL, and simulate them. Xilinx WebPACK, which includes Project Navigator, is used for design entry, and ModelSim is used for simulation. ModelSim can be called from within Xilinx Project Navigator.

SPIM, the MIPS simulator, allows users to simulate MIPS assembly code and translate it into machine code.

The labs written to accompany the text *Digital Design and Computer Architecture* by David Money Harris and Sarah Harris, © Elsevier 2007, describe how to use these Xilinx CAD tools to design and testing digital circuits and how to use SPIM to simulate MIPS assembly code.

The following instructions describe how to install (1) Xilinx WebPACK Integrated Software Environment (ISE) 9.2i and (2) ModelSim Xilinx Edition-III (MXE-III) 6.2g. Free downloads of these software packages are available at:

<http://www.xilinx.com/WebPACK/index.htm>

These instructions also describe how to install SPIM, the MIPS simulator. This software is available for free download at:

<http://pages.cs.wisc.edu/~larus/spim.html>

We also describe how to set up the Spartan 3E Starter Board.

Step 1: Xilinx WebPACK Installation

These instructions begin with an overview of the steps for installing Xilinx WebPACK ISE 9.2i. They are immediately followed by more detailed instructions that include screen shots.

Xilinx WebPACK Installation Overview

1. Go to: <http://www.xilinx.com/webpack/index.htm>
2. Create a free Xilinx account.
3. Download one of the first two options:
 - WebInstall
 - Single File Download
4. Install Xilinx WebPACK.

Xilinx WebPACK Detailed Installation

1. Go to: <http://www.xilinx.com/webpack/index.htm>
2. Create a free Xilinx account by clicking on the “Create Account” button as shown in Figure 1.

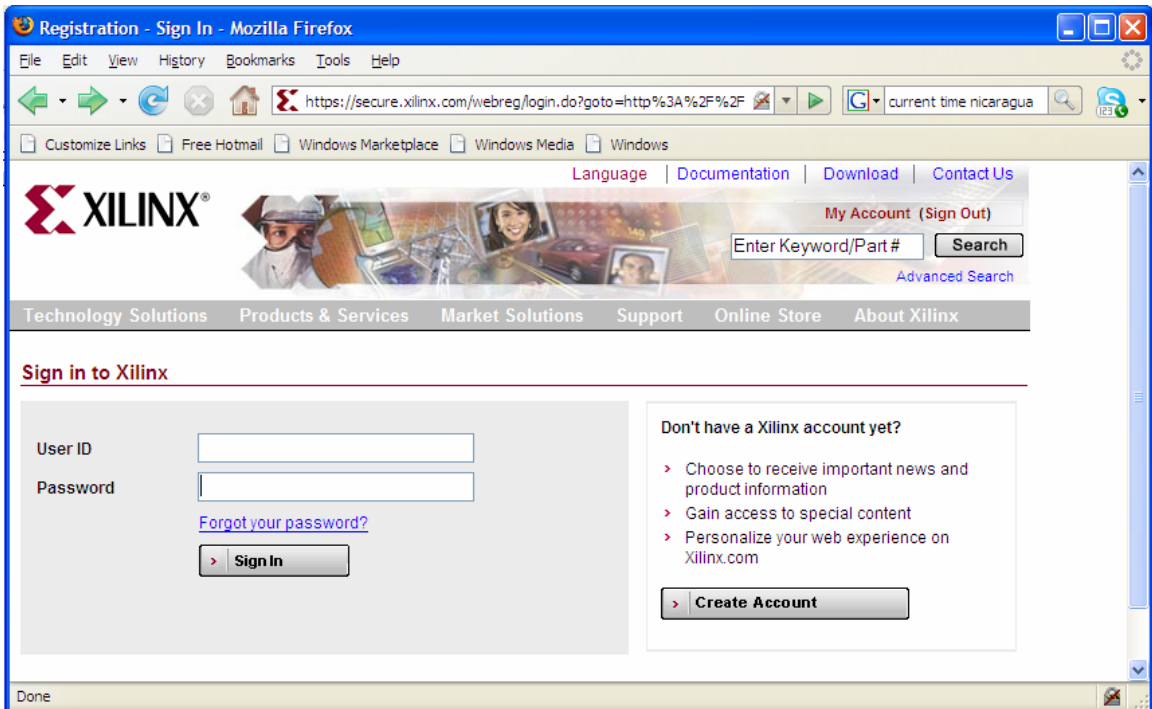


Figure 1. Create account at xilinx.com

3. Download one of the first two options, as shown in Figure 2:
 - WebInstall
 - Single File Download

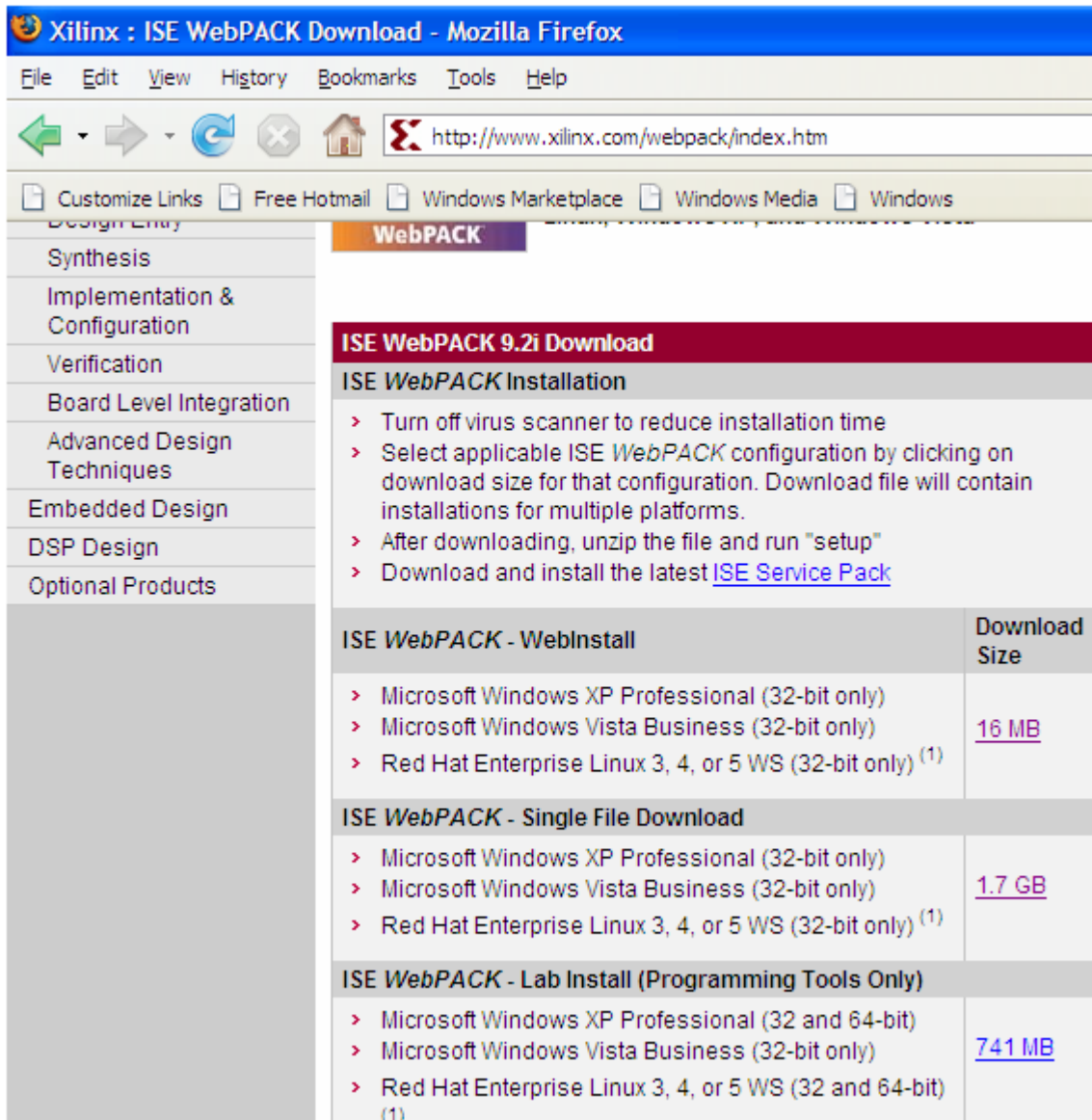


Figure 2. Download Xilinx WebPACK 9.2i

4. Install Xilinx WebPACK.

- Click on the link under the “Download Size” column to begin downloading the software.
- The system will prompt you to save or open the .zip file (for example, called WebPACK92i_WebInstall.zip for the WebInstall option). We recommend saving the file.
- Open the compressed (.zip) file and run “setup.exe”.
- Follow the instructions for installing Xilinx WebPACK as prompted by the setup wizard.

Step 2: ModelSim Xilinx Edition-III (MXE-III) Installation

These instructions begin with an overview of the steps for installing ModelSim Xilinx Edition-III (MXE-III) 6.2g. They are immediately followed by more detailed instructions that include screen shots.

MXE-III Installation Overview

1. Go to: <http://www.xilinx.com/webpack/index.htm>
2. Create a free Xilinx account or login if you already have an account.
3. Download ModelSim Xilinx Edition-III (MXE-III) using the link near the bottom of the page.
4. Install MXE-III.

MXE-III Installation Overview

1. Go to: <http://www.xilinx.com/webpack/index.htm>
2. Create a free Xilinx account or login if you already have an account, as shown in Figure 3.

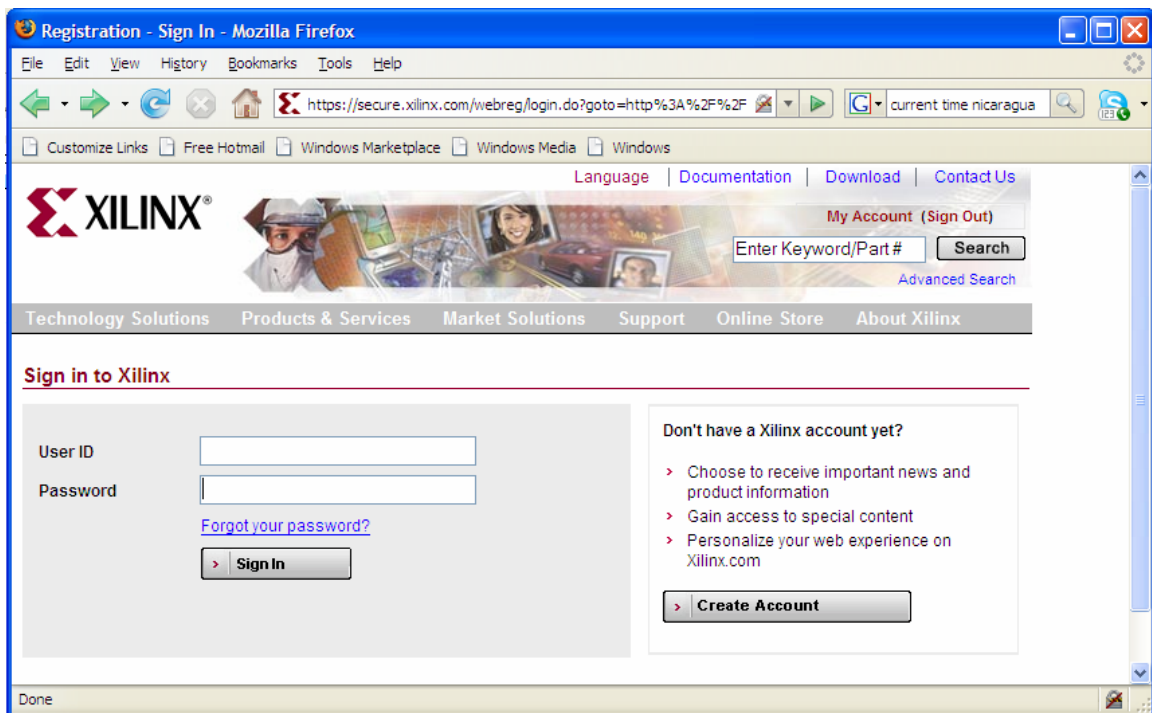


Figure 3. Create or log in to account at xilinx.com

3. Download ModelSim Xilinx Edition-III (MXE-III) using the link near the bottom of the page, as shown in Figure 4.

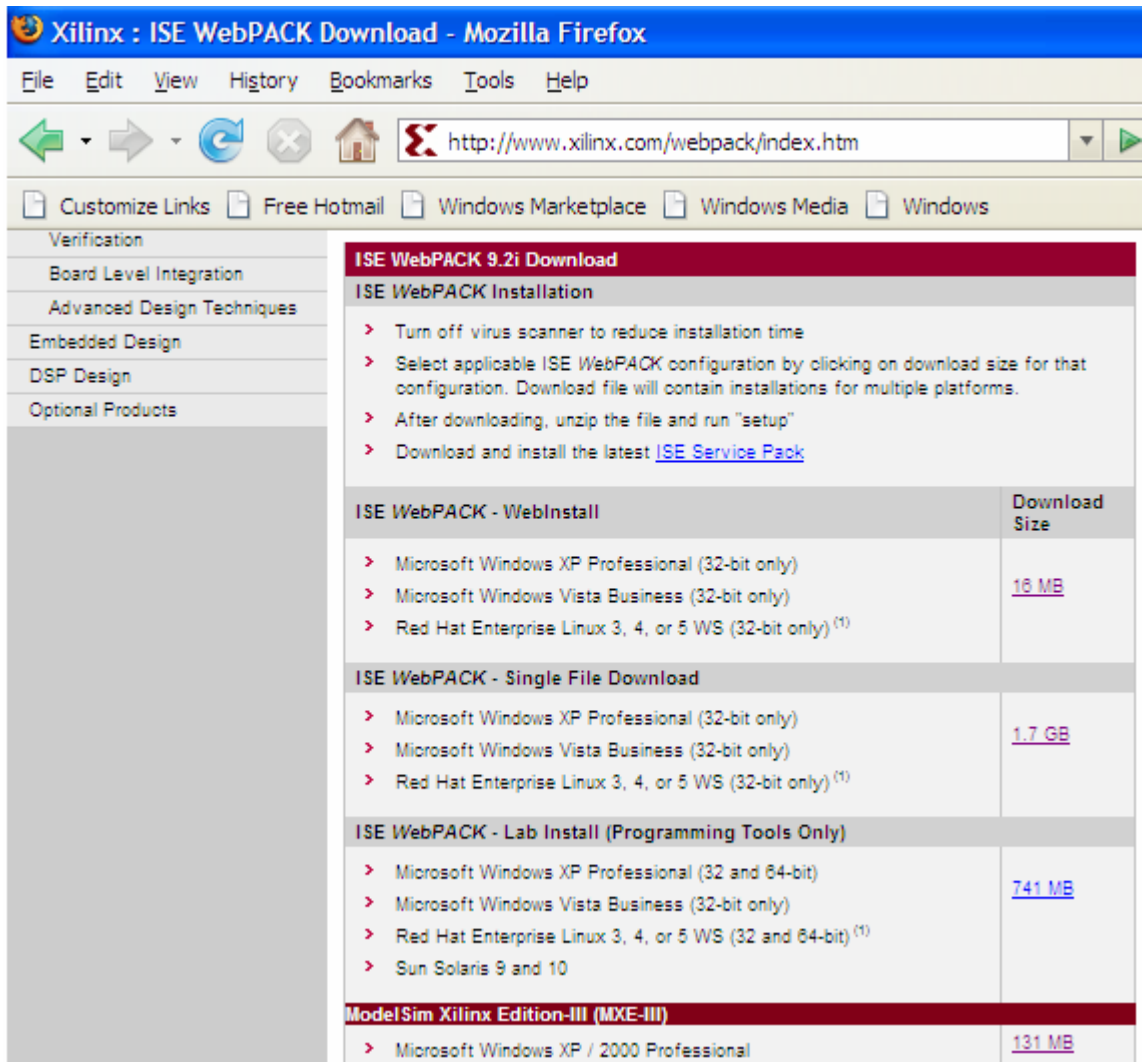


Figure 4. Download ModelSim Xilinx Edition-III (MXE-III)

4. Install MXE-III.

- Click on the link under the “Download Size” column to begin downloading the software.
- A Web page will open prompting you to accept the license agreement. Click the “I Agree” button at the bottom of the page, as shown in Figure 5.



Figure 5. Accept MXE-III license agreement

- A download page will open. Click on the link under the “Description” column in the Download table, as shown in Figure 6.

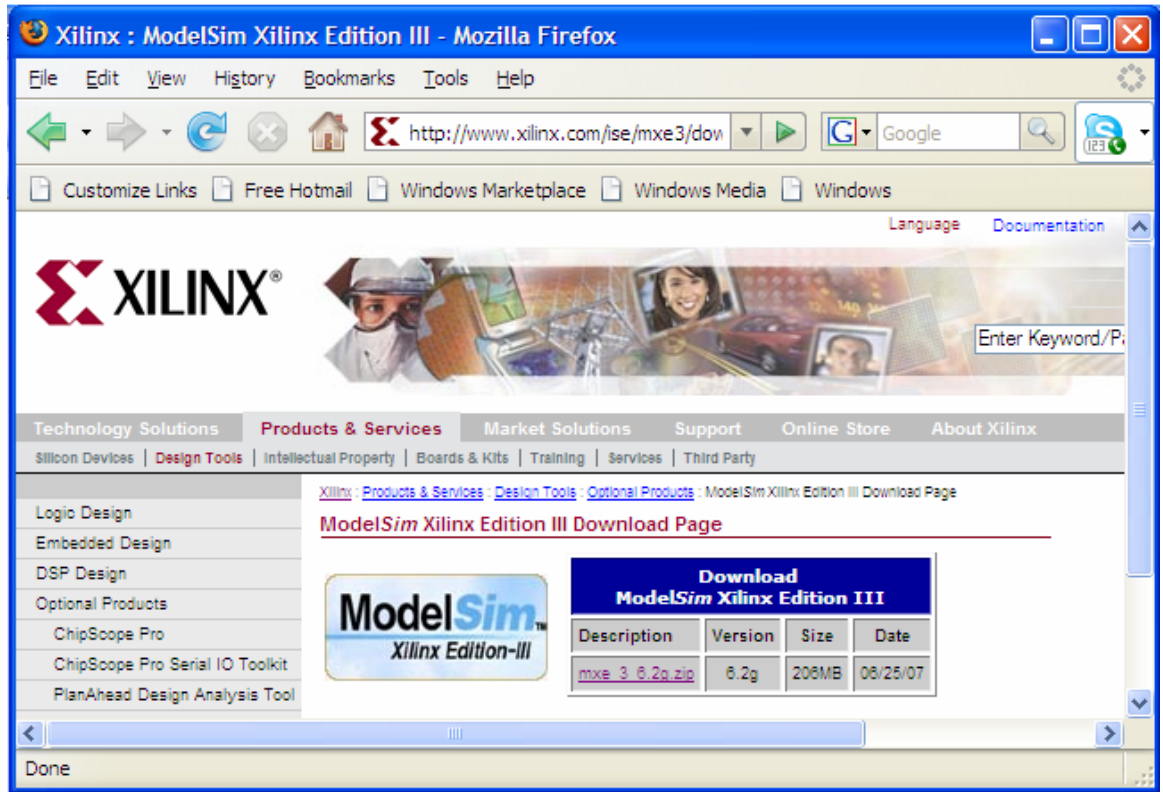


Figure 6. MXE-III download page

- The system will prompt you to save or open the .zip file, mxe_3_6.2g.zip. We recommend saving the file.
- Open the compressed file (mxe_3_6.2g.zip) and run “mxesetup.exe”.
- Follow the instructions for installing MXE-III as prompted by the setup wizard.
 - Select the free version of MXE-II (MXE III Starter), as shown in Figure 7. This Limited Version only allows the user to run one instance of the program at once.

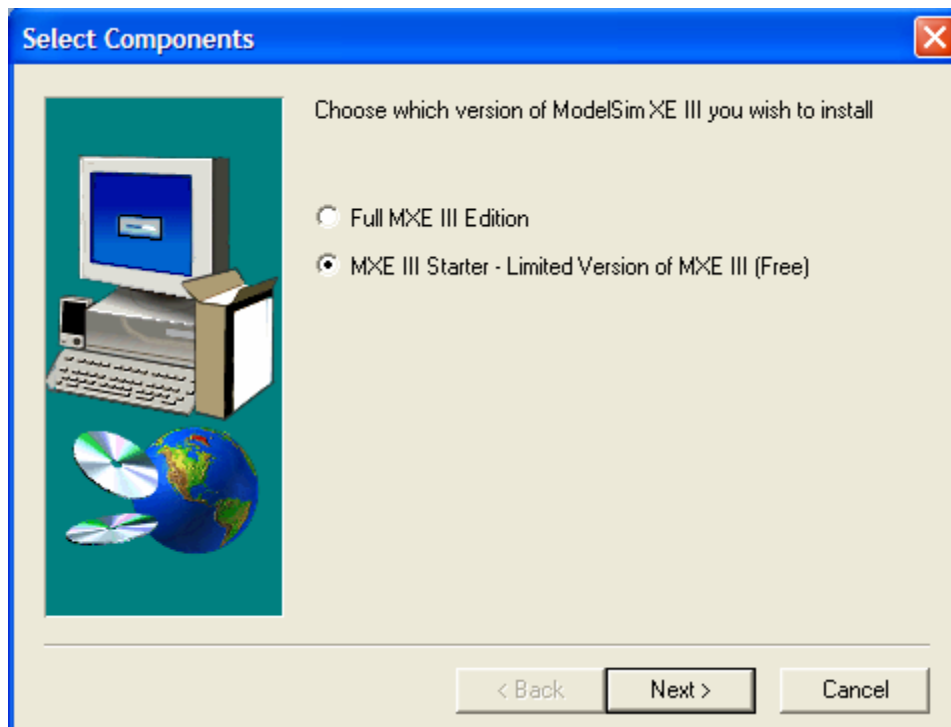


Figure 7. MXE-III installation

- Agree to the license agreement and click on the desired options.
- For example, when you get to the “Select Library Installation Option” screen, you’ll need to choose which HDL to use, as shown in Figure 8. You will still be able to simulate both Verilog and VHDL, regardless of which HDL you choose in this step.

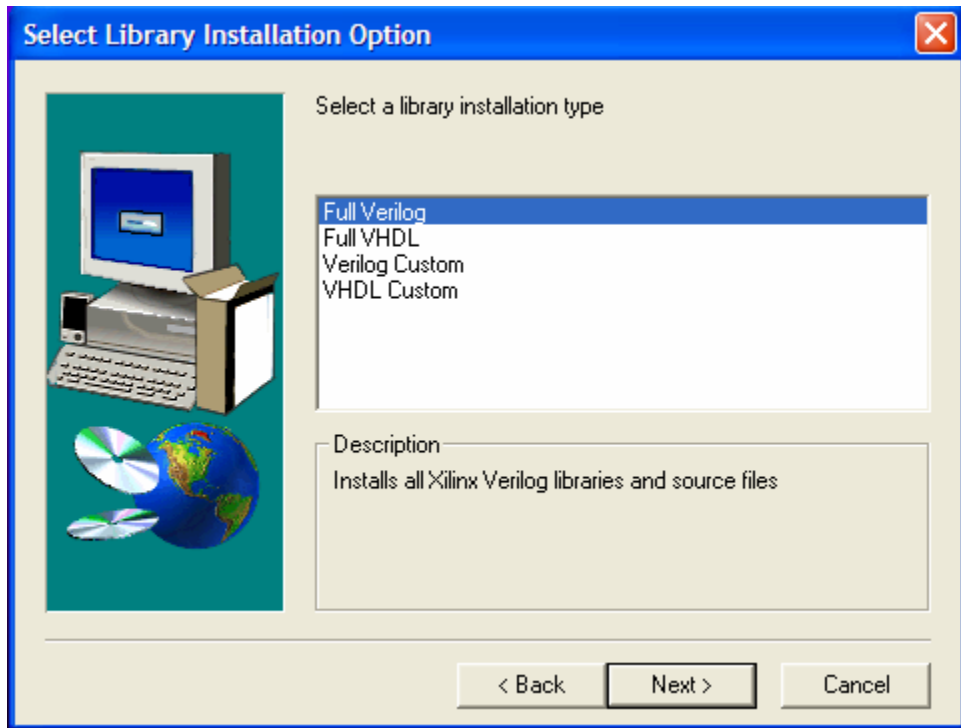


Figure 8. HDL Library Installation Option window

- You will be prompted to perform the licensing request after setup. Complete the licensing instructions that show up on the screen after selecting to view the licensing request. After finishing, close the Licensing Wizard

SPIM Installation

Go to the following website:

<http://pages.cs.wisc.edu/~larus/spim.html>

Follow the instructions found on that website for installing the software on the desired platform.

Spartan 3E Starter Board Installation

The hardware implementation portions of the labs are optional. However, if you choose to use these portions of the labs, you will need to install the Spartan 3E Starter Board. See the Spartan 3E Starter User's Guide for complete instructions:

<http://digilentinc.com/Products/Detail.cfm?Nav1=Products&Nav2=Programmable&Prod=S3EBOARD>

Setup

- Make sure the Spartan 3E board is in JTAG programming mode, with a jumper **only** on M1 (not on M0 and M2).
- Plug the board into the wall outlet.
- Plug one end of the USB programming cable into the board and the other end (the USB end) into your computer.
- Turn on the Spartan 3E board.
- Your PC will likely report that it has found new hardware.
- Follow the prompt for installing the correct USB driver (you'll want to use the Web to update the driver).