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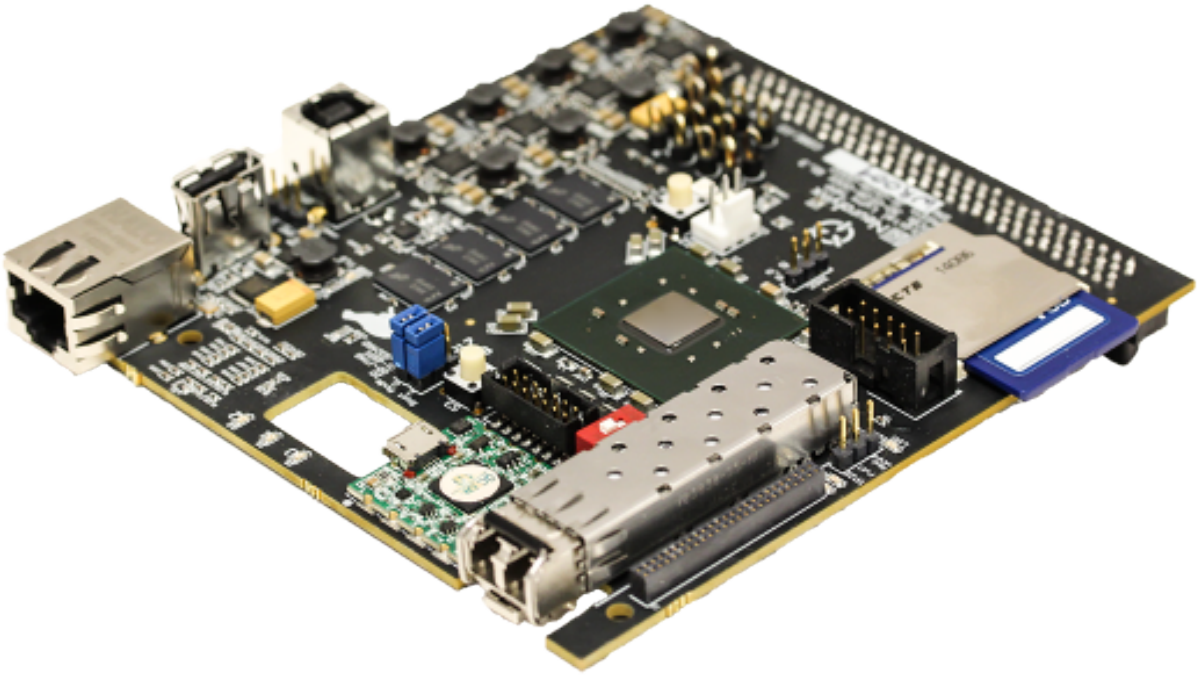

Hardware Processing Platform (HPP): Getting Started Guide

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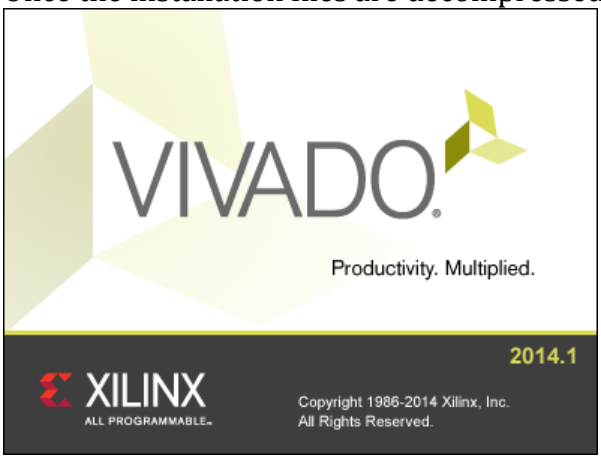
1 Introduction

The Hardware Processing Platform (HPP) runs code developed on a PC and is downloaded through a USB connection. This "Getting Started Guide" walks you through the process of getting the HPP development environment installed and tested.

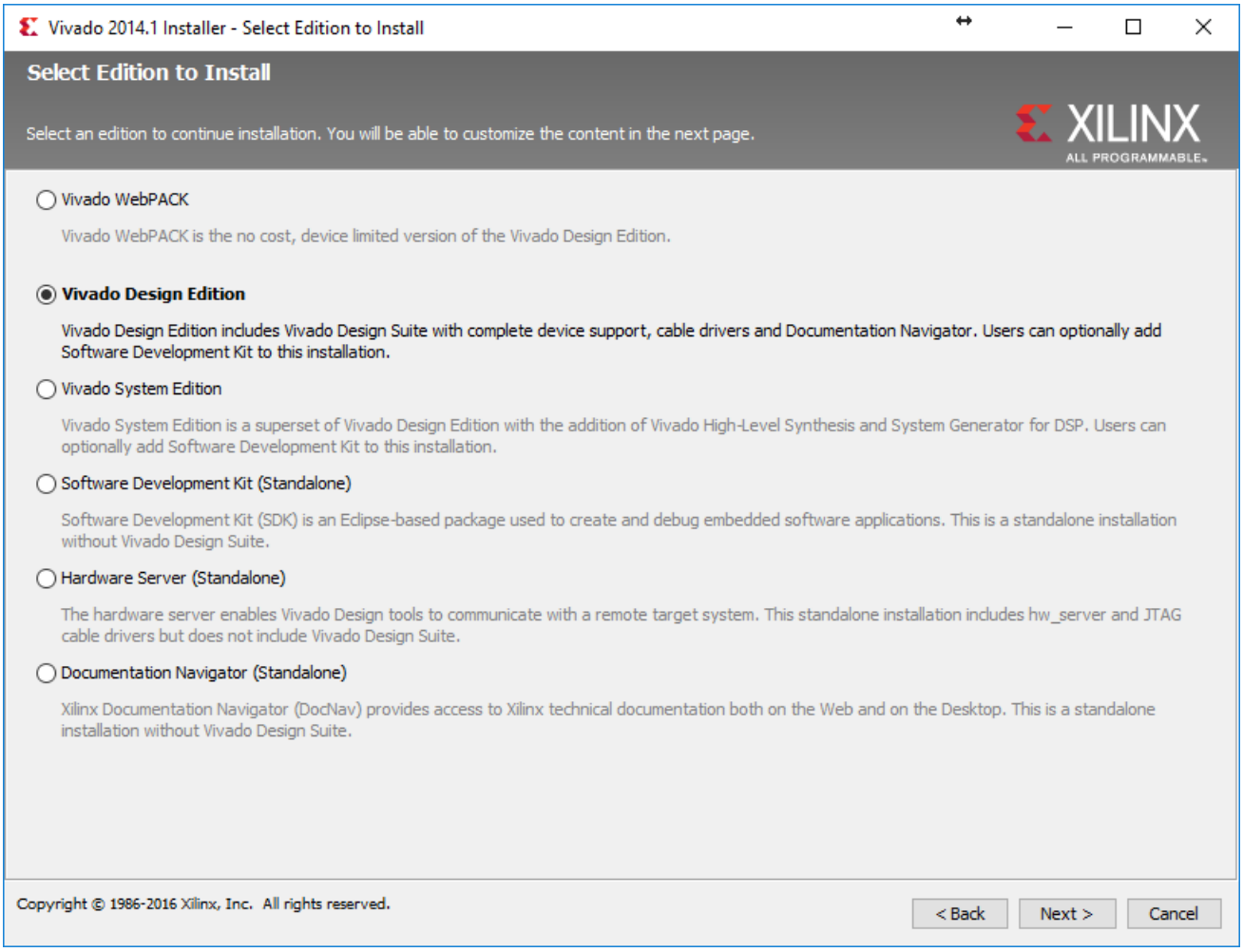
2 Installing Development Software

The development software used with the HPP is Vivado and SDK. The first step is to download this software. Use this link for the download web page:
https://www.xilinx.com/support/download/index.html/content/xilinx/en/downloadNav/vivado-design-tools/2014-1.html
The version to download is "Vivado Design Suite – 2014.1 Full Product Installation"
For this Guide, we will download for Windows. Vivado 2014.1 Full Image for Windows with SDK (5.1GB)
When the file is downloaded, unzip and untar the compressed file. If you don't have an application installed that can unzip and untar a file, you can download 7-zip at www.7-zip.org.
Once the installation files are decompressed, run xsetup.exe



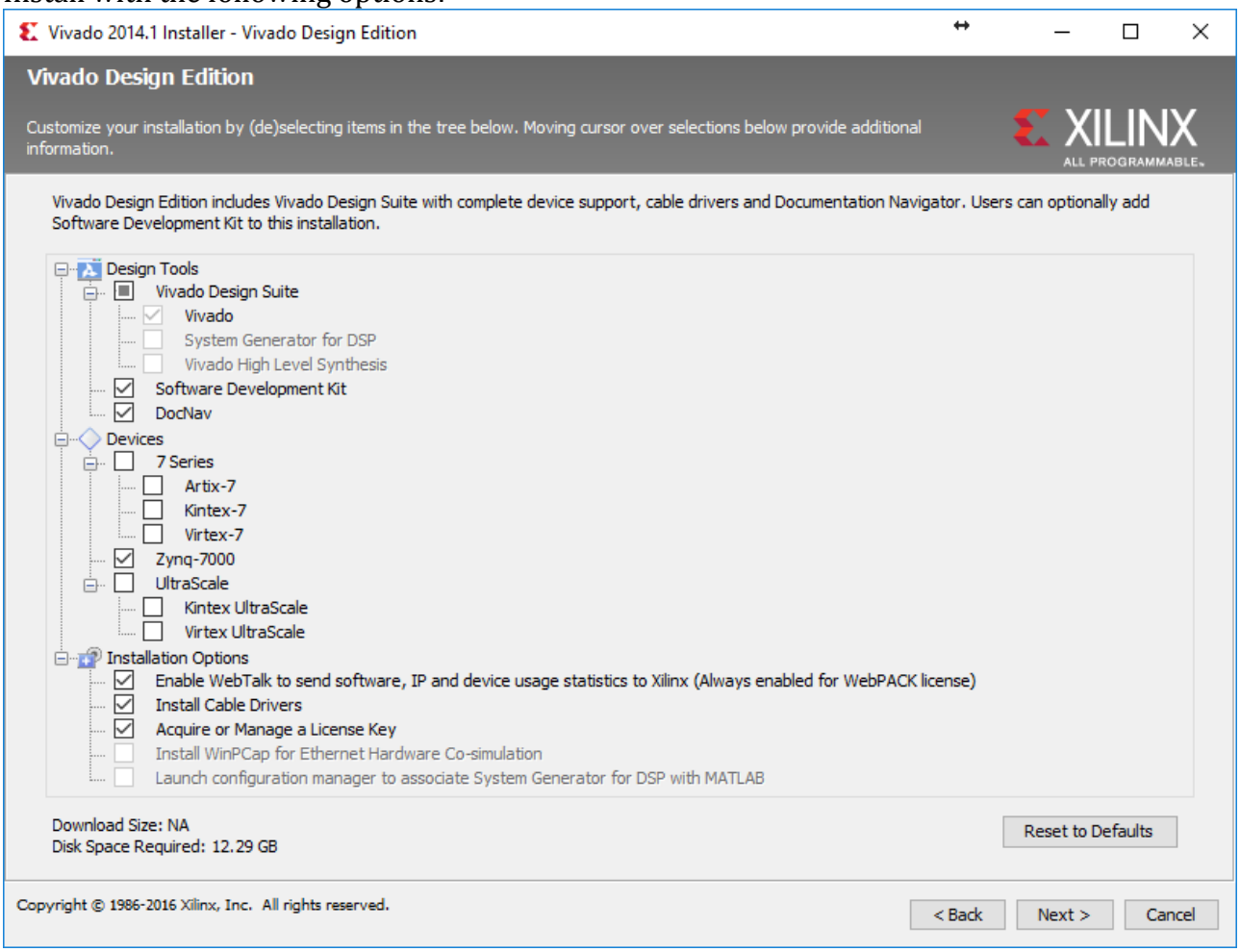
Vivado Installation

If the installation prompts to install the most recent version, decline and continue installing 2014.1. Once you've started the installation process, you will be prompted for the edition to install. You should select Vivado Design Edition.



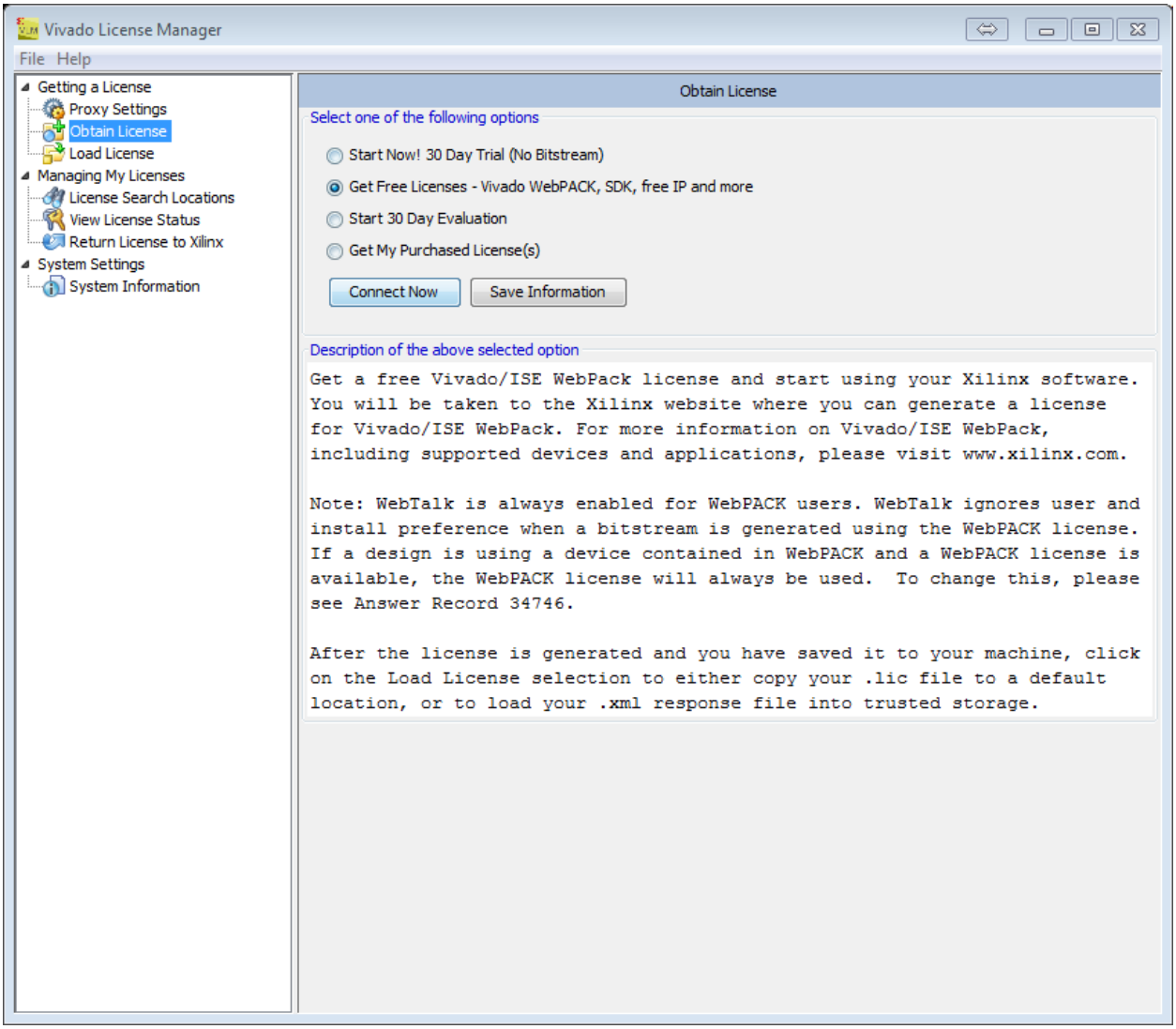
Edition to Install

Install with the following options:



Install Options

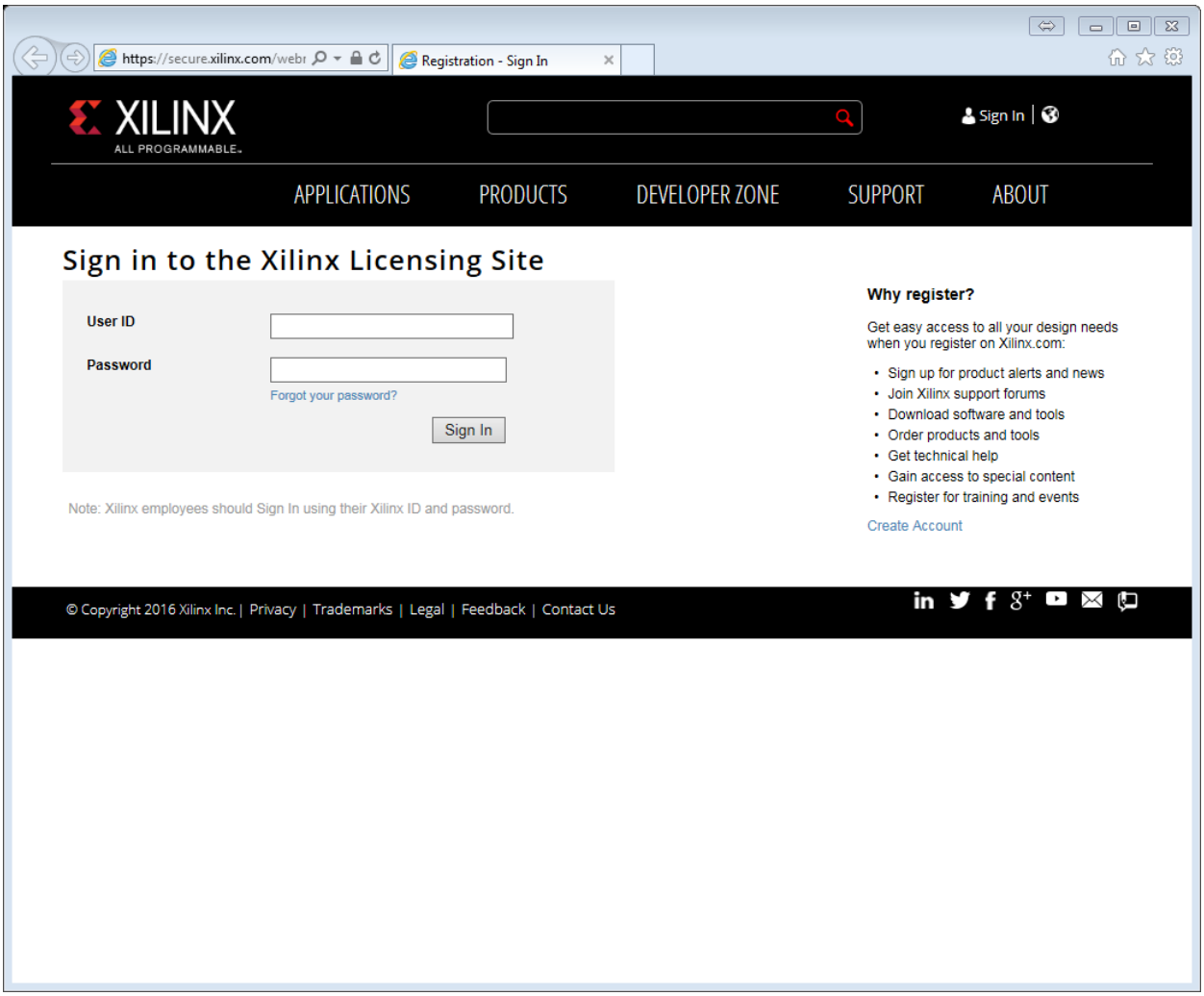
When the installation finishes, the Vivado License Manager will open:



Vivado License Manager

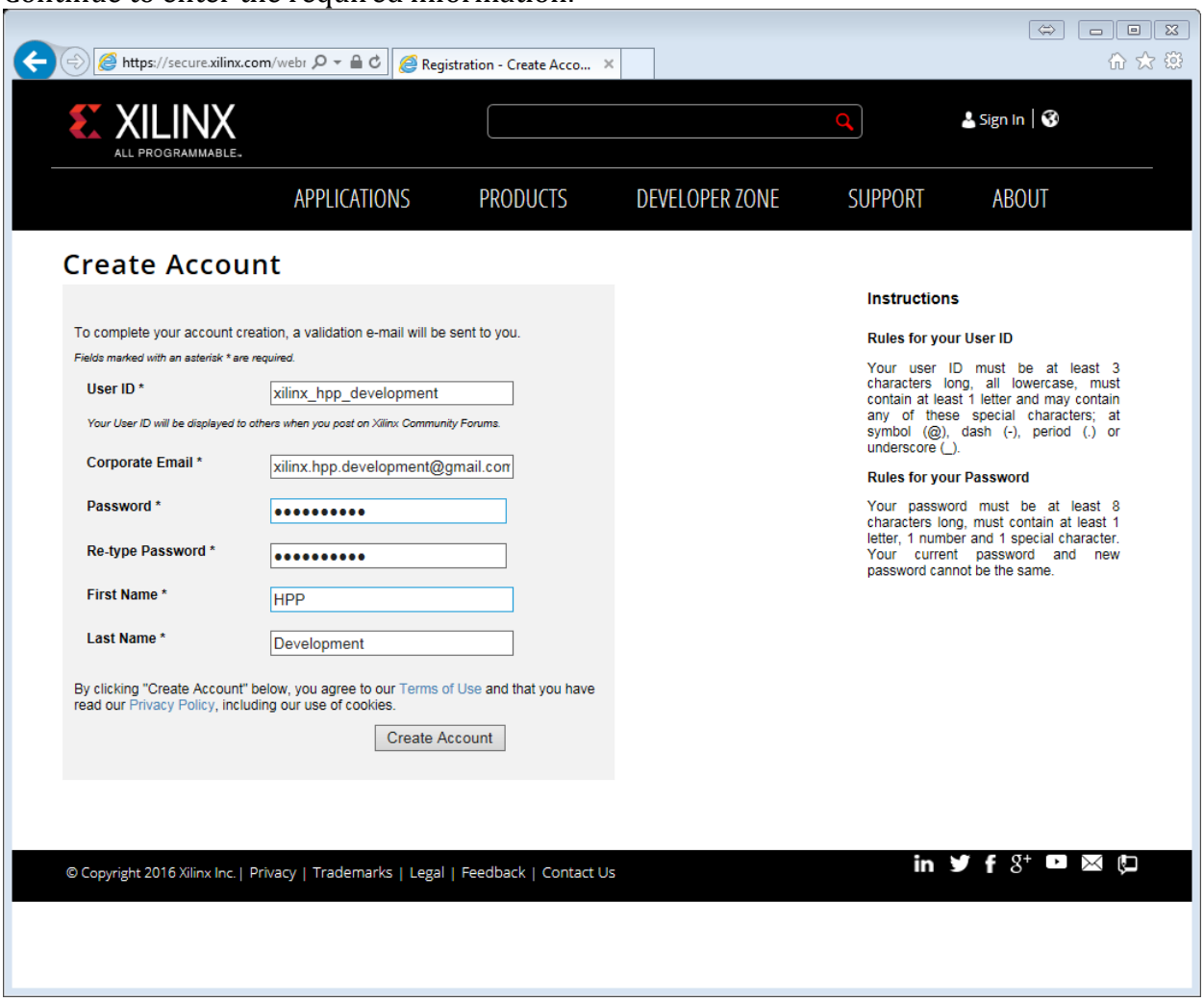
Click on “Obtain License” and select “Get Free Licenses – Vivado WebPack, SDK, free IP and more”, then click “Connect Now.”

You will need to sign up for a free Xilinx account using the “Create Account” link to get a license for the Xilinx software.

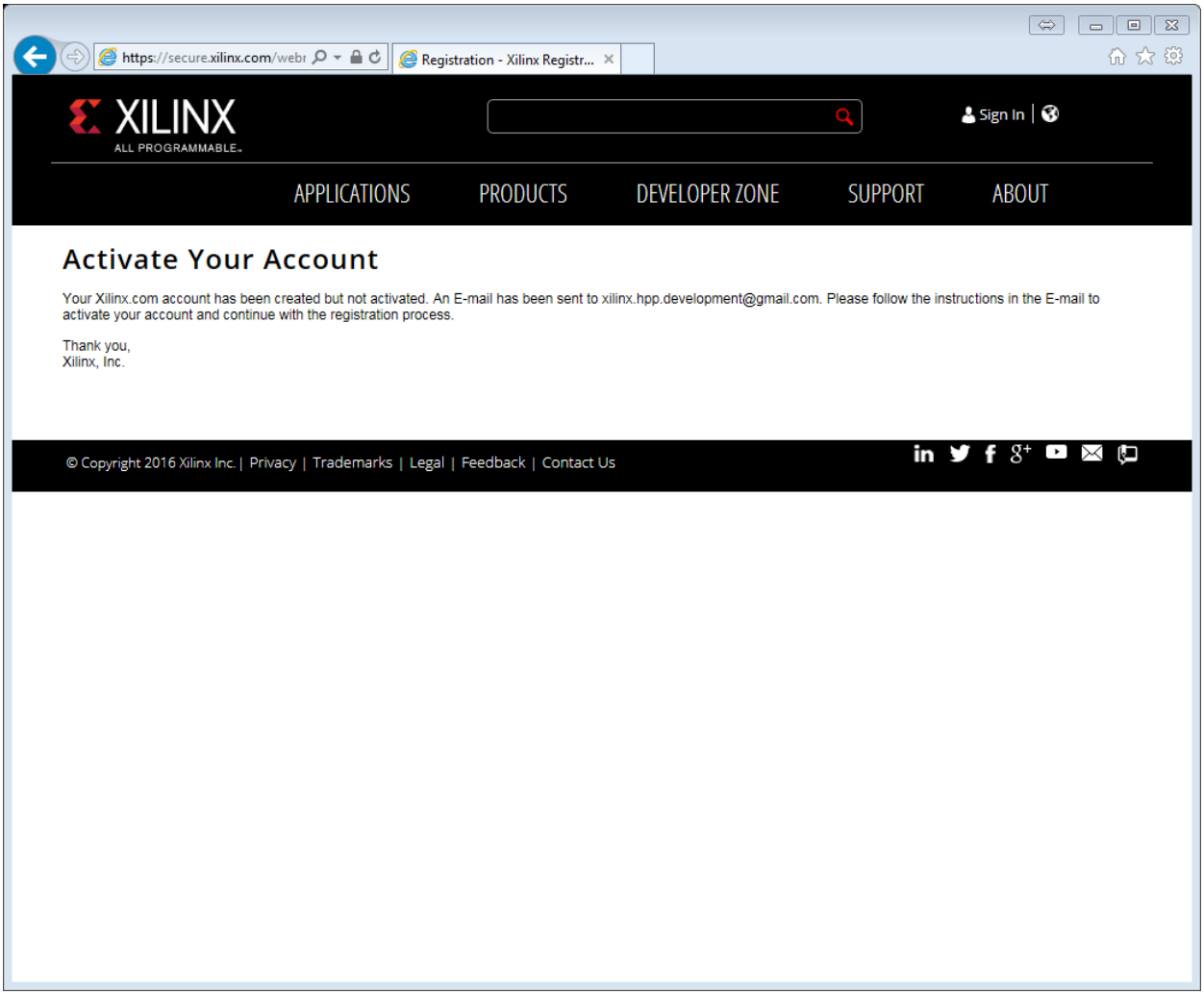


Create Account Link

Continue to enter the required information:



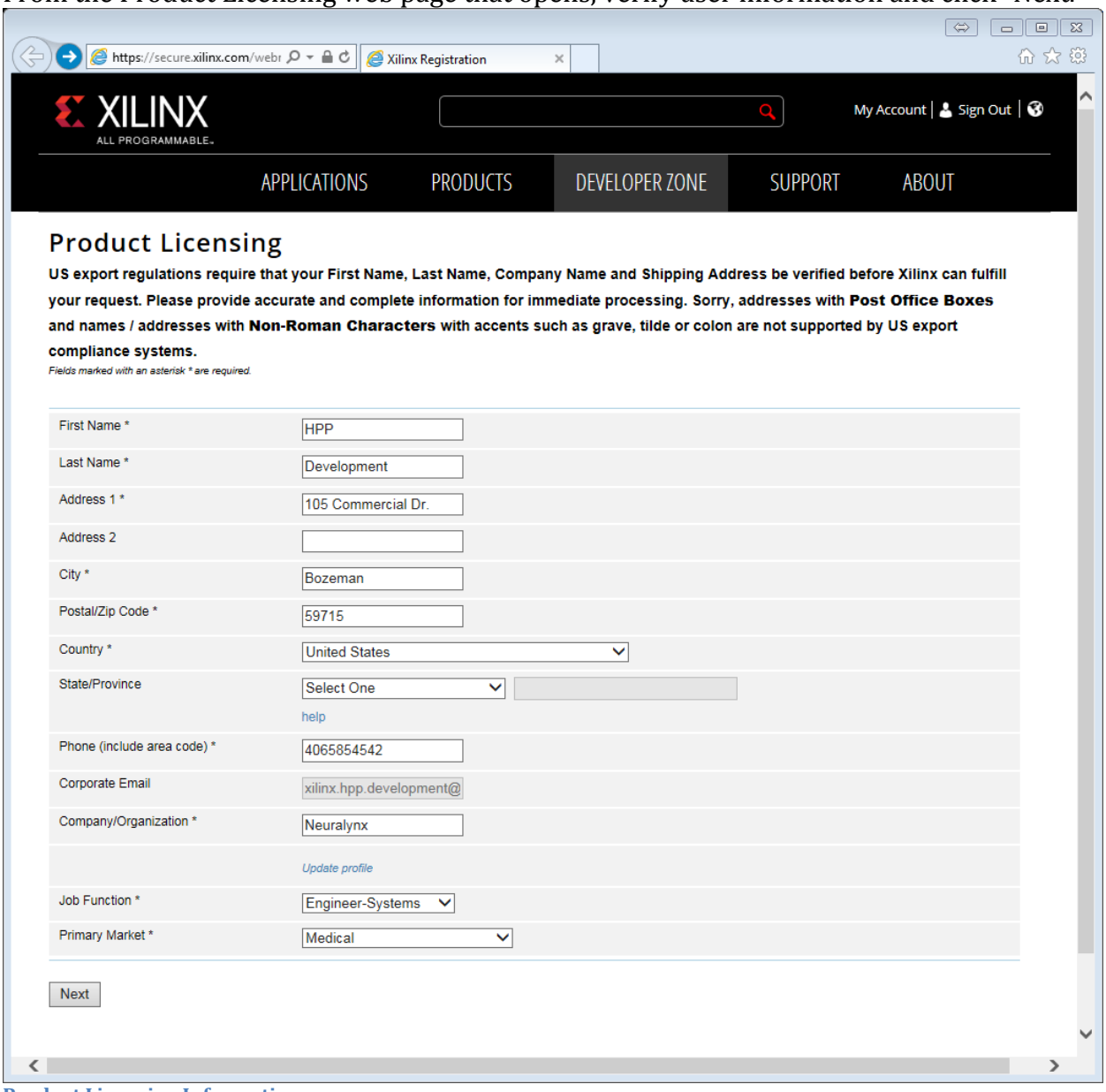
Account information



Activate Account

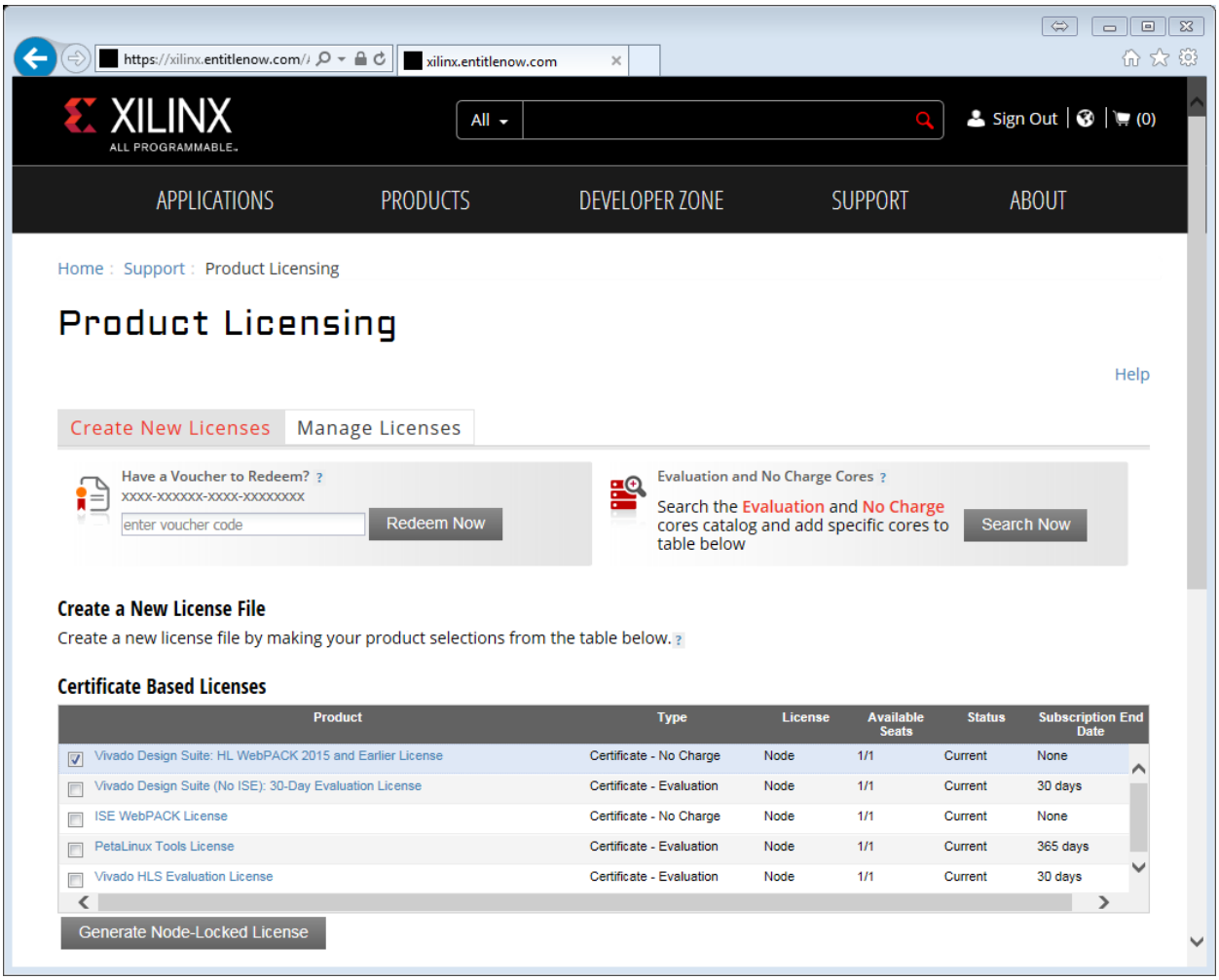
Click on the link in your email to activate your account. This will take you to the Xilinx login webpage. Sign in with your newly created account.
Enter the required profile information (indicated by *) and click "Save Profile."
Return to the Vivado license manager. Click on "Obtain License" and select "Get Free Licenses – Vivado WebPack, SDK, free IP and more." Then click "Connect Now." This will take you back to the licensing web page.

From the Product Licensing web page that opens, verify user information and click “Next.”



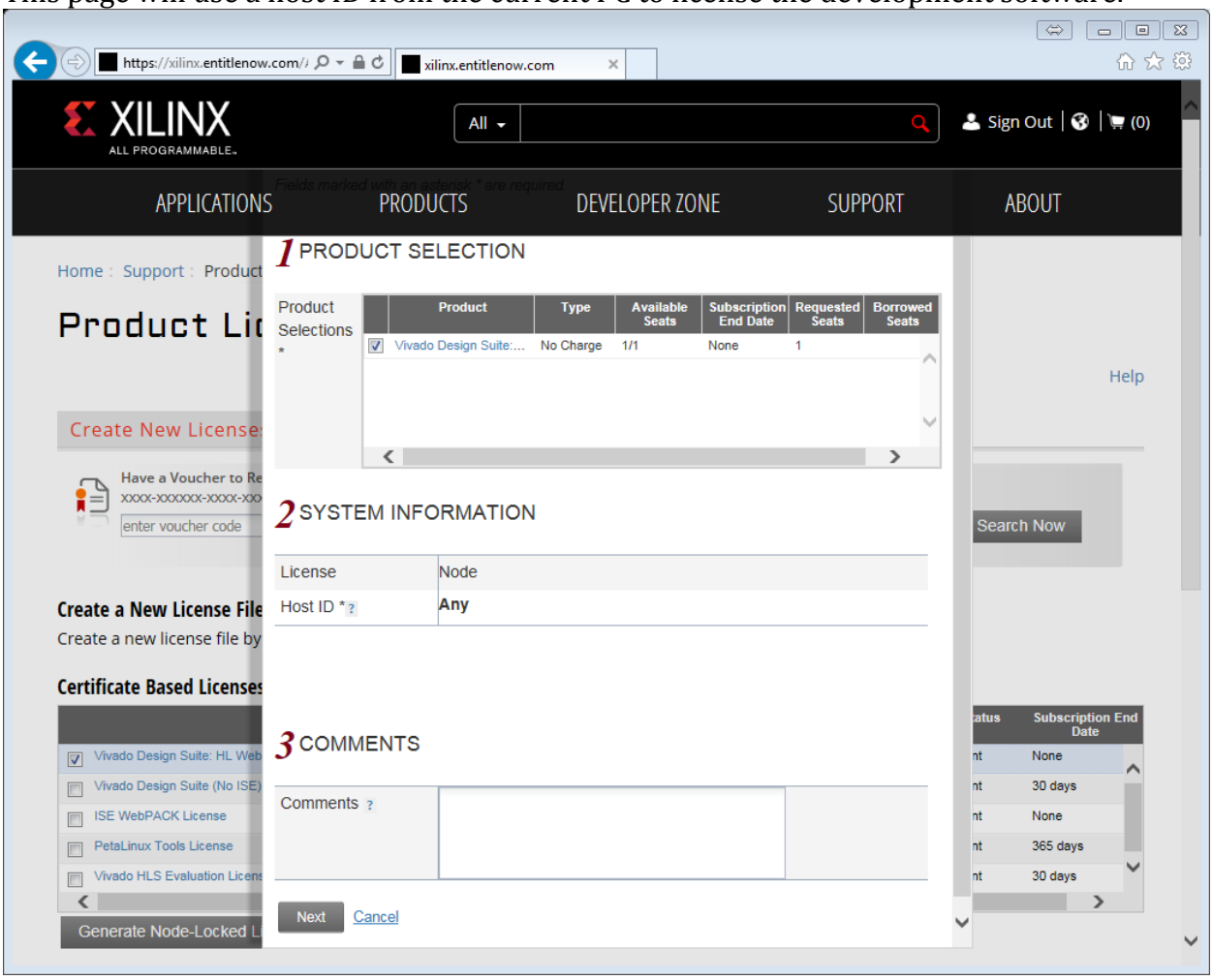
Product Licensing Information

Check the box in “Certificate Based Licenses” for “Vivado Design Suite: HL WebPACK …” and click “Generate Node-Locked License.”

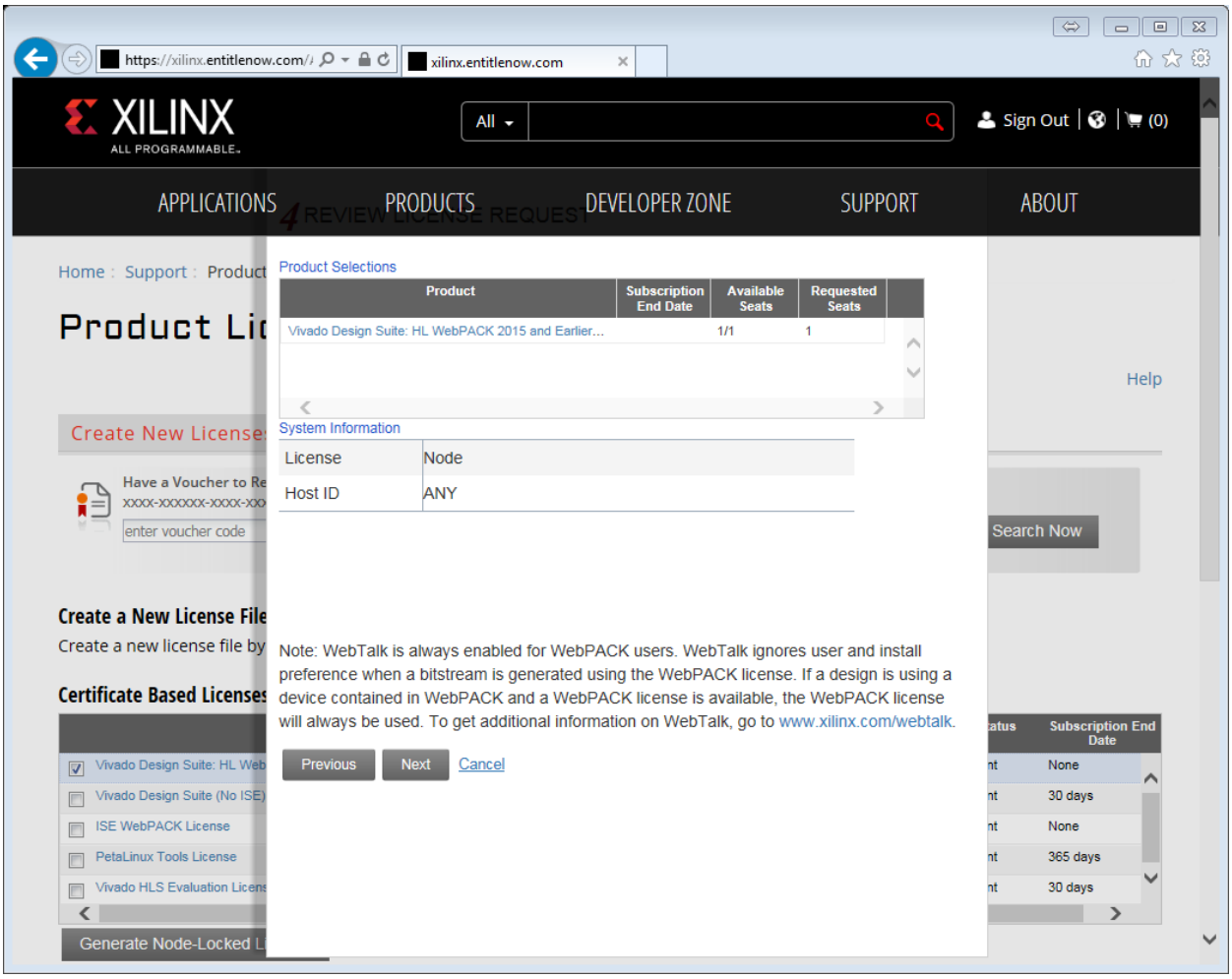


Generate License

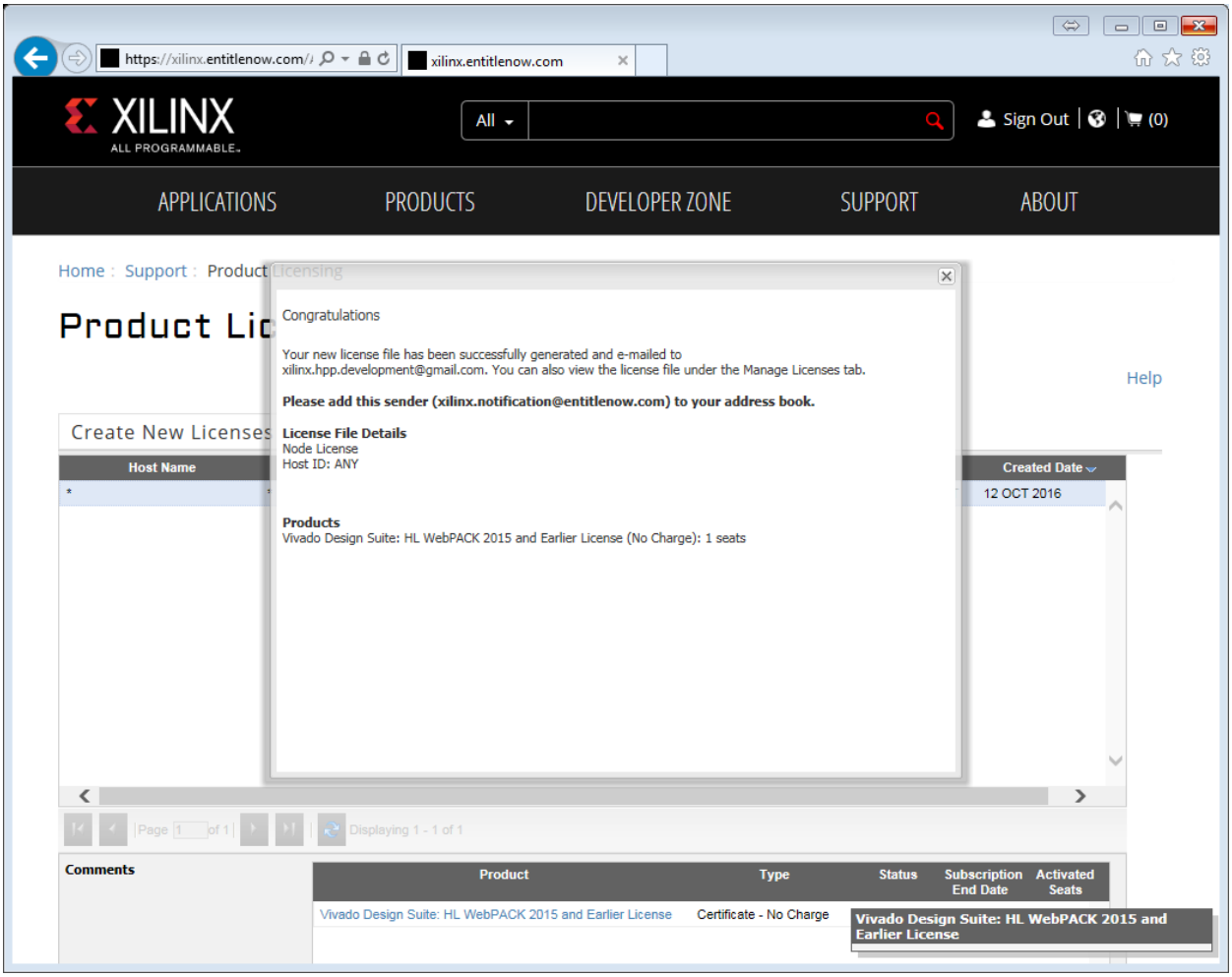
This page will use a host ID from the current PC to license the development software.



Obtain Host ID

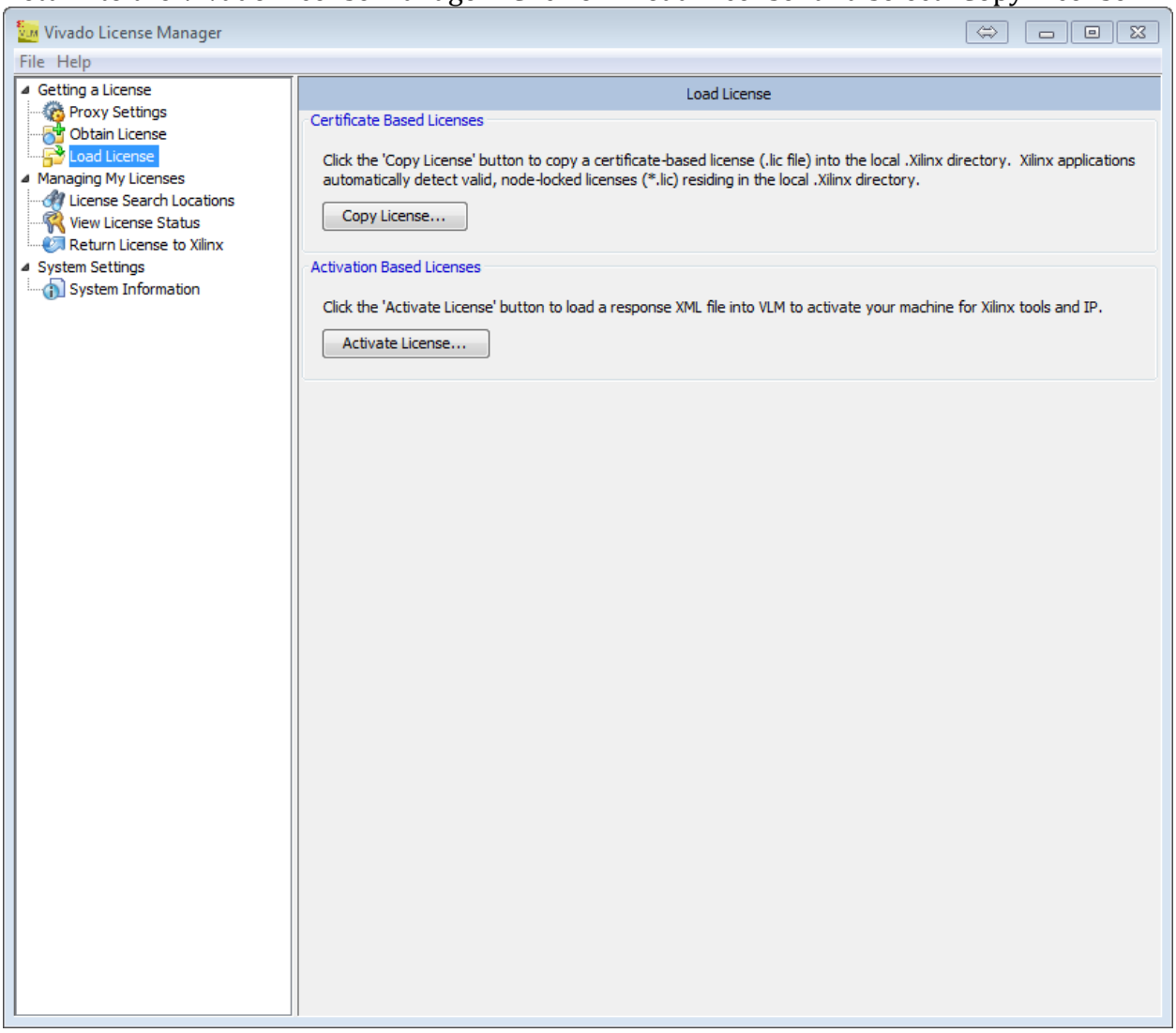


License Information Window 1



License Generation Complete

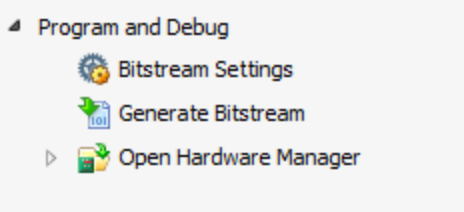
Download the license file that is emailed to your email address.
Return to the Vivado License Manager. Click on “Load License” and select ”Copy License.”



Load License

Locate the downloaded license (Xilinx.lic) and select “Open.”
Close the Vivado License Manager and finish the Vivado installation.

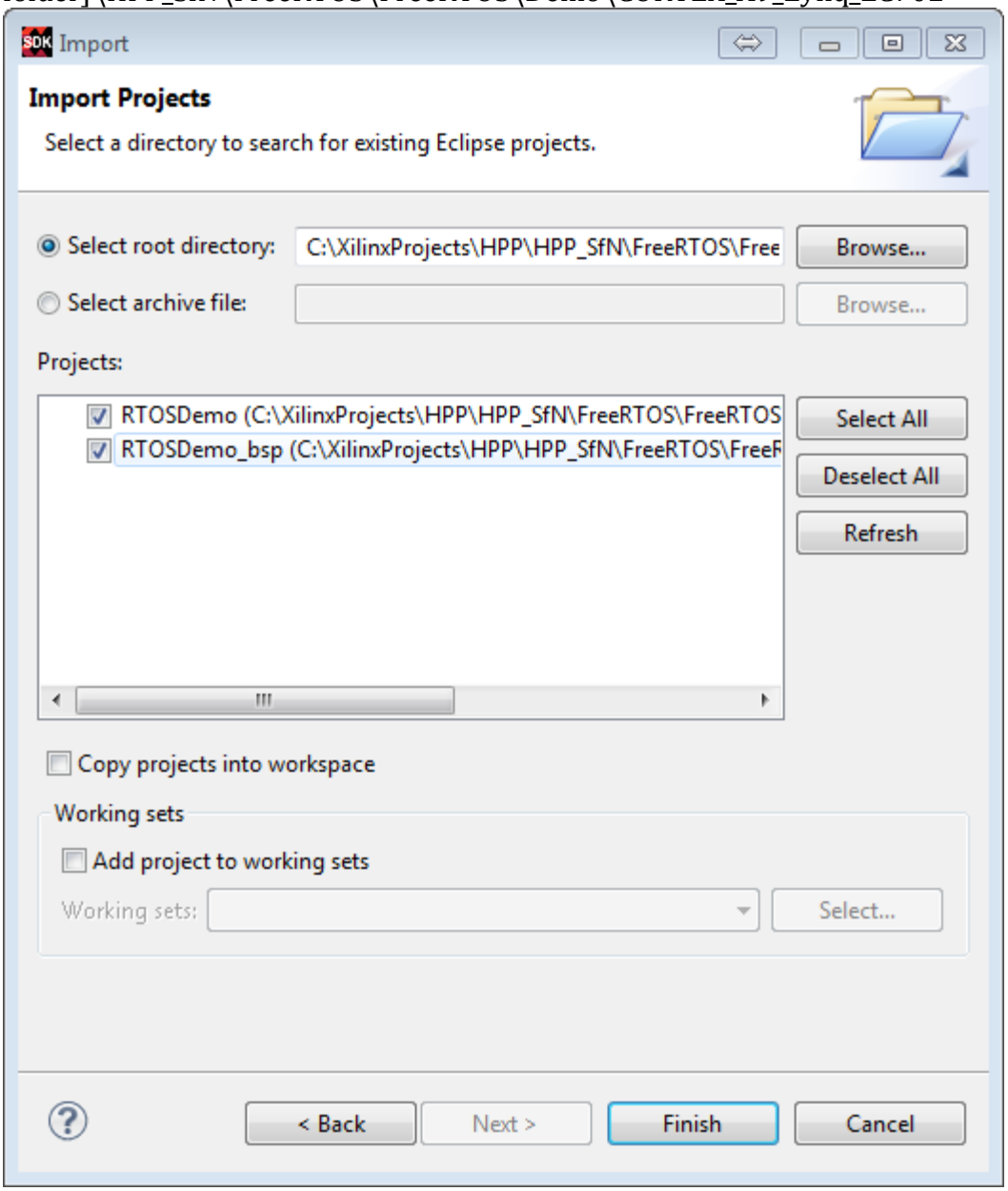
Download the base example project for the HPP from:
https://www.dropbox.com/s/hs3dxnlwoltjoo7/HPP_SfN.zip?dl=0
Unzip the project to a development folder on your development PC.
Open Vivado 2014.1 and load the unzipped project file "HPP_SfN.xpr."
Generate the bitstream by clicking on "Generate Bitstream" on the left side of the interface.



Bitstream generation option

Open Xilinx SDK 2014.1.
Select the workspace of the recently extracted project. This should be located at [Base project folder] \HPP_SfN\FreeRTOS\Workspace.
Right-click on "RTOSDemo" in the Project Explorer and select "delete." Confirm the deletion.
Right-click on "RTOSDemo_BSP" in the Project Explorer and select "delete." Confirm the deletion.

Select menu option “File->Import.”
Choose “Existing Projects into Workspace.”
Select root directory [Base project folder]\HPP_SfN\FreeRTOS\FreeRTOS\Demo\CORTEX_A9_Zynq_ZC702



Import Projects

Click “finish” to Import the files from their new location.
Right-click on RTOSDemo and select “Clean Project.”

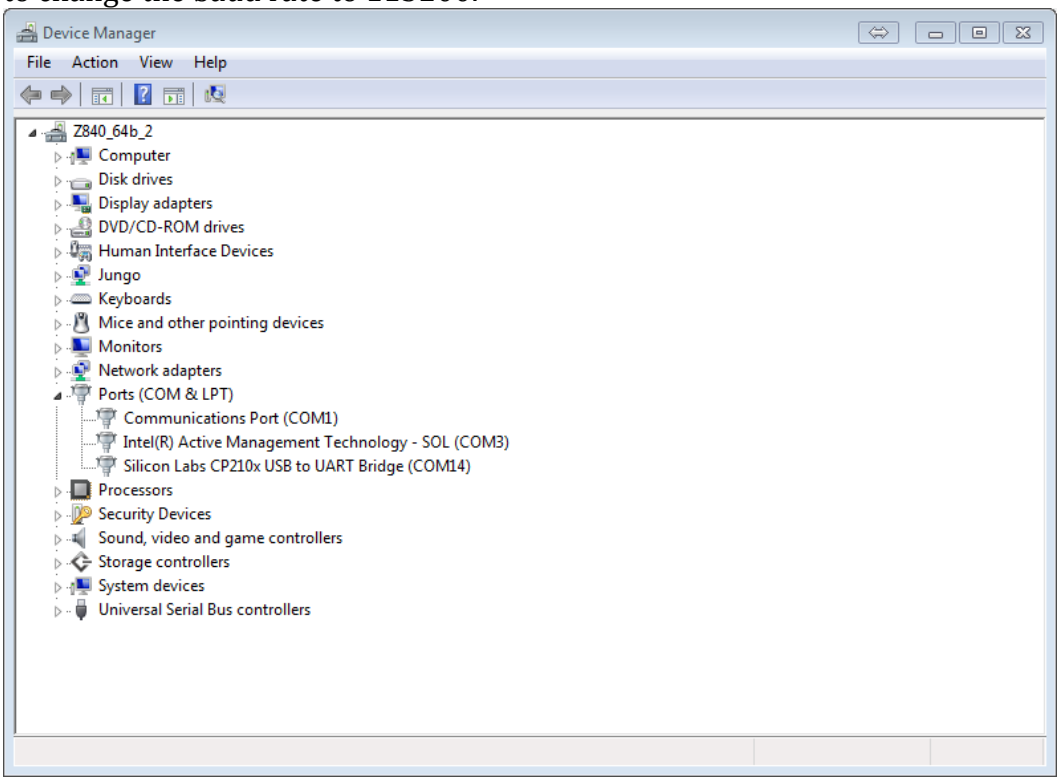
3 Running an Application

The HPP uses a serial command line interface to interact with the operating system. To connect the PC for terminal access, you must have required drivers for the PC.
Download and install VCP driver (CP210x VCP driver) from:
https://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx
If you haven't already done so,

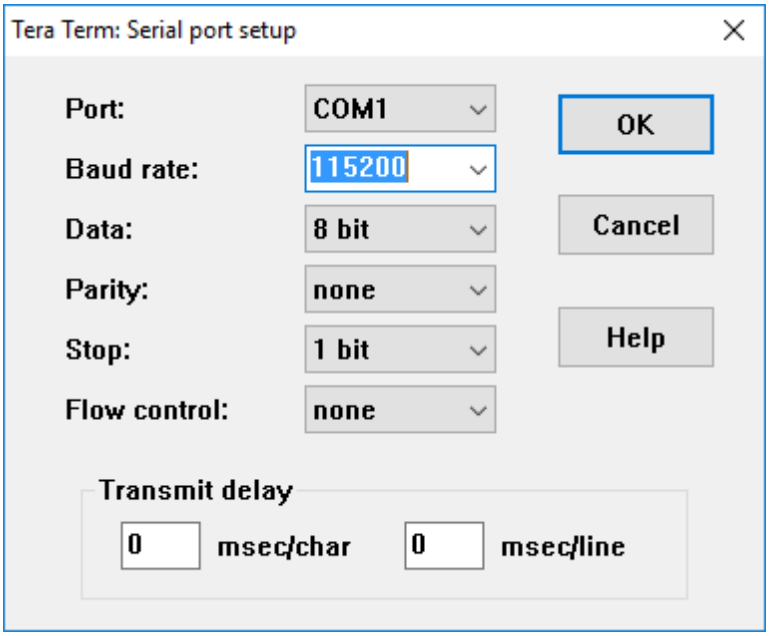
- Attach a USB cable from development PC to Digital Lynx SX port "HPP Terminal"
- Attach a USB cable from development PC to Digital Lynx SX port "HPP JTAG"

If you don't already have a terminal application, you can download Teraterm (https://ttssh2.osdn.jp/index.html.en)

Open TeraTerm, Select “Setup->Serial Port” and select the COM Port of your HPP connection. This is listed in the Windows Device Manager as “Silicon Labs CP210x USB to UART Bridge.” You will also need to change the baud rate to 115200.

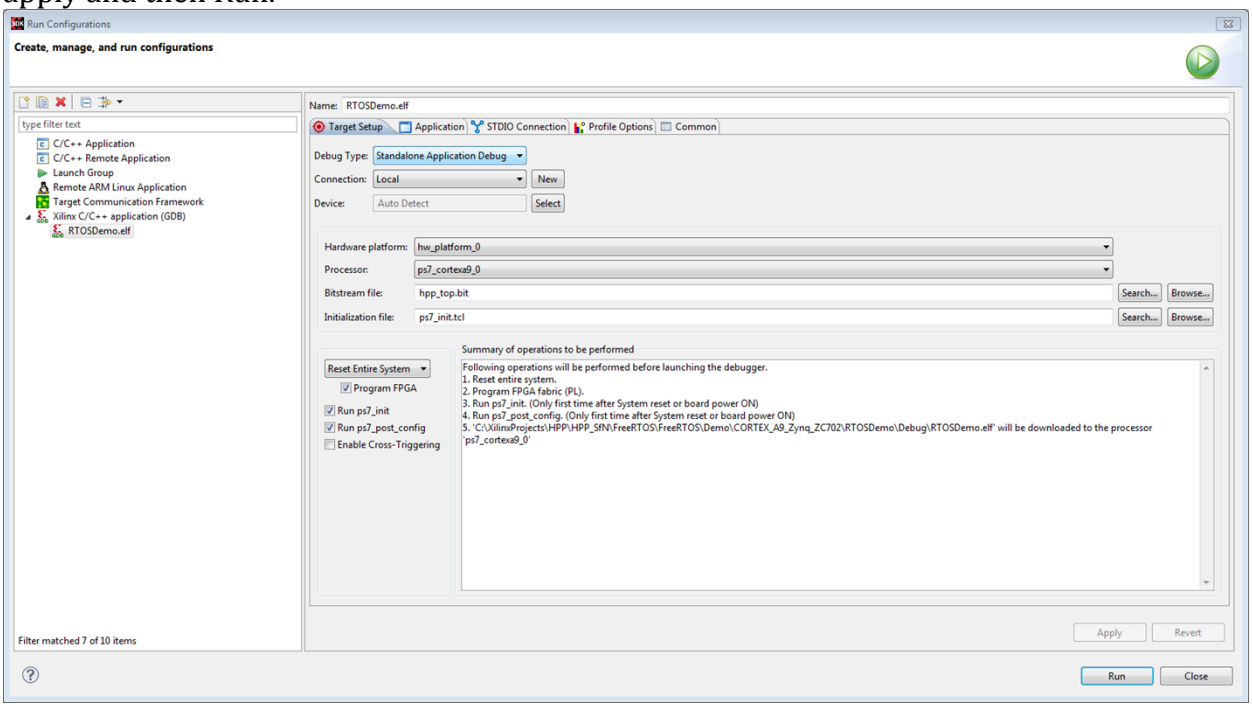


Windows device manager view of COM ports



Serial port setup - Use your COM port

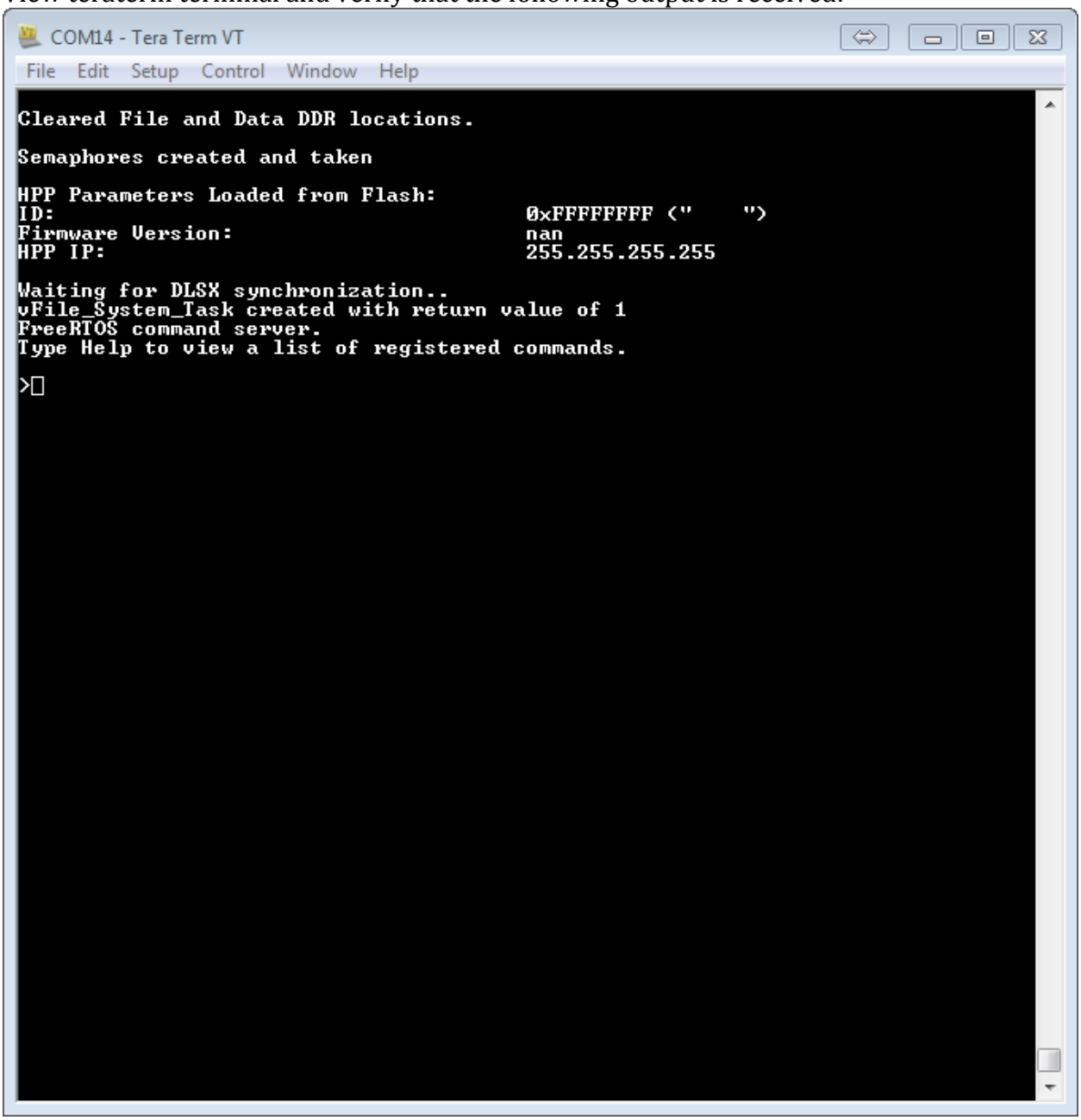
In the SDK, right-click on RTOSDemo and select Run As-> "1 Launch on Hardware (GDB)." This will create a default run configuration for this application.
In the SDK interface, Select Run->Run configuration. In the Target Setup tab, select "Reset Entire System" for the reset option drop down box. In the Bitstream file box, click Search and choose hpp_top.bit. Click apply and then Run.



Run Configuration

This will begin a download process visible in the lower right progress bar. This process usually takes about 15 seconds as it configures the FPGA, then it will download the application.

View teraterm terminal and verify that the following output is received:



Type “help” and Enter, this will output a default menu.

For more information or questions, please contact:

HPP_Support@neuralynx.com / 406-585-4542