Avnet SpeedWay Design Workshops™

Lab 0 – Pre-Lab

Setting Up a Development Platform for Zynq

June 2017
Version 06

Lab Setup

To complete all of the Speedway labs, the following software and hardware setups are required.

Software

The recommended software for this Speedway is:

- O/S supported by Xilinx® Vivado® Design Suite 2017.1
  - See UG973 v2017.1 *Release Notes* for the supported list
  - Windows-7 64-bit was used to develop this Speedway
- Xilinx Vivado Design Suite 2017.1 (available for download free of charge from Xilinx website)
- MiniZed users
  - Windows 7 and 10 supports the FTDI USB-to-UART bridge without any extra drivers installed
- 7-Zip file archiver tool
- Tera Term
- Adobe Reader for viewing PDF content
  - Adobe Reader X or later recommended for this SpeedWay

Hardware

The recommended target hardware consists of the following:

- Windows 7 64-bit PC with a minimum of 1.6 GB RAM available for the Xilinx tools to complete a XC7Z007S design
    - https://www.xilinx.com/products/design-tools/vivado/memory.html
- Avnet MiniZed Development Kit - https://www.avnet.com/shop/us/p/kits-and-tools/development-kits/avnet-engineering-services/aes-minized-7z007-g-3074457345632706668
- MiniZed users:
    - One additional USB cable (Type A to Micro-USB Type B) – *only one included in kit*

Lab Instruction Notes

Throughout all the Speedway labs, a generalized instruction is given. If you're comfortable completing the task based on that instruction, feel free to do so. If not, step-by-step instructions are provided.

Technical Support

For technical support with any of the labs, please contact your local Avnet FAE or visit the support forum for MiniZed:

www.minized.org/forum

Additional technical support resources are listed below.

Evaluation Kit home pages with Documentation and Reference Designs

www.minized.org

Xilinx technical support

You may contact your local Avnet FAE or Xilinx Online Technical Support at www.support.xilinx.com . On this site you will also find the following resources for assistance:

- Software, IP, and Documentation Updates
- Access to Technical Support Web Tools
- Searchable Answer Database with Over 4,000 Solutions
- User Forums
- Training - Select instructor-led classes and recorded e-learning options

Avnet technical support

Contact your Avnet FAE or the forums for any additional questions regarding the MiniZed, reference designs, kit hardware, or if you are interested in designing any of the kit devices into your next design.

Lab 0 Overview

This lab will provide appropriate guidance for setting up a suitable development platform under Windows 7 using the Xilinx Vivado WebPACK 2017.1 tools.

Lab 0 Objectives

When you have completed Lab 0, you will know how to do the following:

- Set up a Windows PC environment for Zynq development
  - Download, install, Xilinx Vivado WebPACK 2017.1
  - Install 7-Zip archive utility
  - Install Tera Term for use as a serial terminal
- Install appropriate target development board USB-UART drivers under Windows
- Obtain and extract the appropriate Speedway training files archive

Experiment 1: Install 7-Zip, Vivado 2017.1, and SDK 2017.1

This experiment shows how to obtain and install the **7-Zip** archive utility.

There are known limitations to using the Windows Explorer Zip utility, specifically with respect to very long path names, which can cause problems when extracting archived Vivado projects.

The SpeedWay lab documentation assumes that the **7-Zip** archive utility is installed locally on the development PC. It is strongly recommended that **7-Zip** archive utility be installed so that the instructions in the subsequent lab activities can be followed exactly.

Experiment 1 General Instruction:

Download and install the most recent version of **7-Zip** installer and install this utility on your development PC. Download and install Vivado 2017.1

Experiment 1 Step-by-Step Instructions:

1. To download the latest version of 7-Zip, it can be accessed from the following URL:

   http://www.7-zip.org/

   Locate the 7-Zip installer and launch the installer by double clicking on the file.

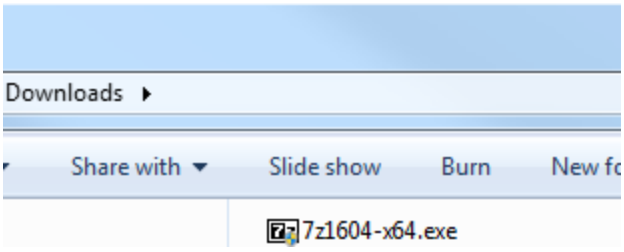

Figure 1 – Launching the 7-Zip Installer

2. Finish installation of 7-Zip

3. Download the Vivado Design Suite 2017.1 "**Vivado HLx 2017.1: WebPack and Editions – Windows Self Extracting Web Installer**" from the Xilinx Downloads page which can be accessed from the following URL:

   https://www.xilinx.com/support/download/index.html/content/xilinx/en/downloadNav/vivado-design-tools/2017-1.html

4. Run the installation program to begin the install

5. Make sure when installing to install the WebPACK edition of Vivado as it does not require a license in order to work with your MiniZed.

6. Under the installation options list, **make sure that the SDK option is selected** (by default it is not selected) and use the default selection for the remaining options.

7. When the installation is completed the **Xilinx License Manager** will open.

Experiment 2: Installing Tera Term

For the SpeedWay lab documentation, Windows 7 was used which does not come with a built in terminal application such as HyperTerm. The open source, free, software implemented, serial terminal emulator application **Tera Term** was used in all lab documentation which can be downloaded from the **Tera Term** project on this SourceForge Japan page:

http://ttssh2.sourceforge.jp

This experiment provides guidance on how to install **Tera Term** which can be used for MicroZed or ZedBoard development. Installing **Tera Term** is strongly recommended for following later lab document instructions. However, if you already have a preferred serial terminal emulator application which you feel comfortable using with development boards featuring a USB-UART device, this experiment can be skipped and your serial terminal emulator application substituted for **Tera Term** in all subsequent lab instructions.

Experiment 2 General Instruction:

Download the most recent version or locate the local **Tera Term** installer and install this utility on your development PC.

Launch the installer and follow the on-screen prompts to install the Tera Term serial terminal emulation application.

Experiment 2 Step-by-Step Instructions:

1. You can download the latest version of Tera Term, it can be accessed from the following URL:

   http://ttssh2.sourceforge.jp

   Locate the Tera Term installer and launch the installer by double clicking on the file.

2. A User Account Control may display indicating that the publisher could not be verified. Since Tera Term is open source software and most open source software does not go through the digital signature publishing process, it should be safe to install this software on your local machine as long as the source of the software is well known. However, only install at your own risk. If you have a verified terminal application provider, please use that. Click on the **Yes** button to continue launching the Tera Term installer.

3. Read through the presented License Agreement. If you accept the terms of the agreement, click on the option **I accept the agreement** and click the **Next** button.

4. A component selection is then displayed, accept the default settings and click on the **Next** button to continue installing Tera Term.

5. A language selection is then displayed, select the appropriate language for your region (English is strongly recommended) and click on the **Next** button to continue installing Tera Term.

6. An additional task selection is then displayed, de-select the **Create Tera Term shortcut to Quick Launch** option and click on the **Next** button to continue installing Tera Term.

7. The Tera Term Setup Wizard is now ready to begin the installation. Click on the **Install** button.

8. Wait while the Tera Term installation continues which will complete after about 1 minute. During this time, several Access Control prompts may be displayed. Be sure to allow access to the installer in order to successfully complete the installation.

9. Once the Tera Term Setup Wizard has completed installation, click on the **Finish** button to close the Setup Wizard.

10. Once Tera Term is installed you are ready to use your terminal program

Experiment 3: Setting Up SpeedWay Lab Files

This experiment provides guidance on how to setup the SpeedWay lab files relating to the corresponding courses.

MiniZed users attending the **Developing Zynq-7000 AP SoC Software** course will need to extract the contents of the **ZynqSW_2017_1_student.zip** file archive to the following folder:

C:\Speedway

MiniZed users attending the **Developing Zynq-7000 AP SoC Hardware** course will need to extract the contents of the **ZynqHW_2017_1_student.zip** file archive to the following folder:

C:\Speedway

Extracting the archives to the appropriate folders is required in order to follow course lab document instructions.

Experiment 3 General Instruction:

Extract the SpeedWay lab file archives relating to the corresponding courses to the appropriate local folders.

Experiment 4 Step-by-Step Instructions:

1. Users attending the **Developing Zynq-7000 AP SoC Software** course will need to extract the contents of the **ZynqSW_2017_1_student.zip** file archive to the following folder:

   C:\Speedway

   Appropriate paths are included within the archive which will create a sub-folder structure containing lab instructions, slides, solution files, and support documents under the **C:\Speedway\ZynqSW\2017_1** folder:

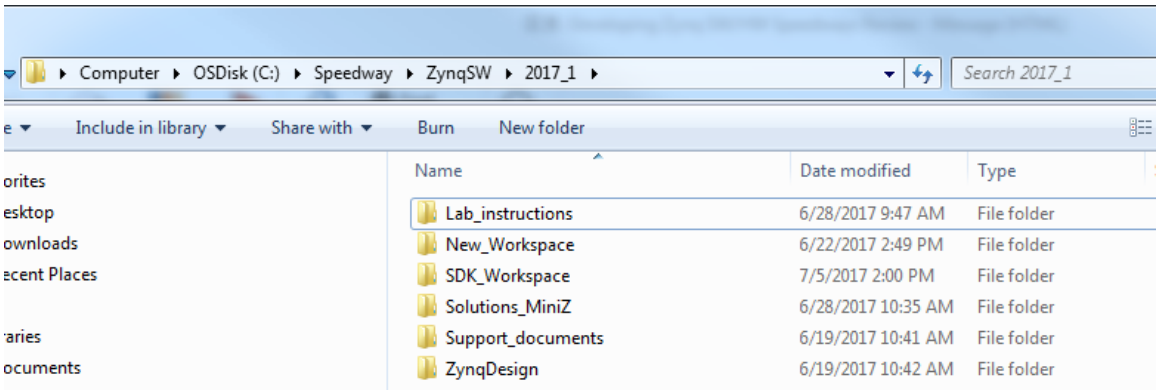

Figure 2 – Zynq Software Course Files Extracted

2. Users attending the **Developing Zynq-7000 AP SoC Hardware** course will need to extract the contents of the **ZynqHW_2017_1_student.zip** file archive to the following folder:

   C:\Speedway

   Appropriate paths are included within the archive which will create a sub-folder structure containing lab instructions, slides, solution files, and support documents under the **C:\Speedway\ZynqHW\2017_1** folder:

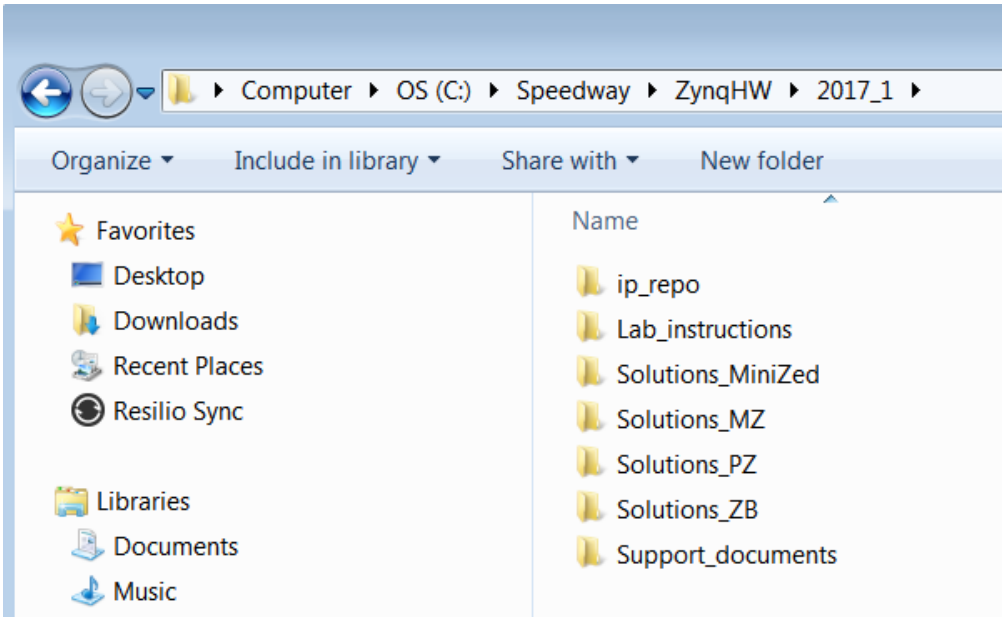

Figure 3 – Zynq Hardware Course Files Extracted

Revision History

Date	Version	Revision
12 Nov 13	01	Initial Release
20 Nov 13	02	Updated instructions on Cypress persistent USB-UART Driver
30 Nov 13	03	Updated instructions, not yet published
24 Mar 15	04	Update to 2014.4
10 Aug 16	05	Updated to 2016.2
22 May 17	06	Updated to 2017.1, added MiniZed/Rebranded

Resources

www.minized.org

www.microzed.org

www.picozed.org

www.zedboard.org

www.em.avnet.com/drc

www.xilinx.com/zynq

www.xilinx.com/sdk

www.xilinx.com/vivado