Overview

This will instruct you on how to install the tools necessary in order to run PetaLinux 2017.1 on the Avnet MiniZed.

Objectives

When this tutorial is complete, you will have installed all the necessary tools to program the MiniZed with PetaLinux. The tools will be installed under an Ubuntu 16.04 LTS virtual machine.

Installing these tools will allow you to perform the rest of the class's labs.

Experiment Setup

Software

The software used to test lab 0 were:
- Host OS: Windows-7 64-bit / Windows 10 64-bit
- VM OS: Ubuntu Linux v14.04.LTS 64-bit virtual machine
- Xilinx Toolchain: Xilinx Vivado, SDK and PetaLinux 2017.1
- You will download a pre-made Virtual Box VM as well as the Xilinx tools

PC Requirements

- Windows-7/10 PC with a minimum of 2 GB RAM (preferred 4GB) available for the Xilinx tools to complete a XC7Z007S design[1]. This is the amount the tools require by themselves, this is not the total RAM of your machine.
- The PC should have at least 8GB total system RAM, 16GB is preferred.
- Enough free hard drive space to install Oracle VirtualBox with the minimum required tools: *at least* 60GB is desirable, 100GB is more ideal. This is in order to have room for the VM as well as downloading, installing and using the Xilinx tools (You want to leave the host OS room too).
- The class VM file itself is designed to expand up to 200GB if needed. It starts out at about 6GB and grows to about 60GB for the minimum tools installation.
- You want to install the VM on the fastest hard disk/ssd you have. It is possible to install the VM on an external hard disk or thumb drive but you will want it to be fast; use a USB 3.0 device if you have one.

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[1] Refer to https://www.xilinx.com/products/design-tools/vivado/memory.html

Additional Equipment required (you must bring to class):

- (1) Avnet MiniZed
- (2) micro-USB cables 1-3'
- (1) USB Flash drive formatted FAT or FAT32
- (1) USB Type A extension cable (optional – needed if your Flash drive is wide)
- (1) TE Connectivity HTU21D Humidity and Temperature PMOD Sensor

Instructions:

There is a total minimum of about 15GB of downloading that needs to occur. The download and installation time will take longer than the actual work time to setup the tools.

Assuming all goes well, it is estimated that you will spend about 1 hour of time performing hands on steps (that doesn't include the time waiting for the downloads and automated installations).

It is estimated that the downloading and waiting for tools to install will take on average 1-4 hours depending upon your internet speed to the tool's servers.

Please plan accordingly! The steps do not need to be done all at one contiguous sitting.

Prepare your PC, Install the Tools

1. Verify Your BIOS Virtualization Settings

Installation of a 64-bit guest operating system is only recommended on a 64-bit host operating system. Also, virtualization technology (AMD-V or VT-x) must be supported by the processor and enabled in the BIOS.

On Lenovo T420 laptops, Virtualization Technology BIOS settings must be enabled in order to run a guest OS in 64-bit mode, change these settings in the **BIOS Security → Virtualization** settings menu.

On HP Z210 workstations, Virtualization Technology BIOS settings must be enabled in order to run a guest OS in 64-bit mode, change these settings in the **BIOS Security → System Security** settings by setting VTx and VTd to Enabled and accepting with F10 then saving the updated settings.

Windows™ 7 machines that are deployed with Bitlocker™ and other PC protection software require special attention when changing BIOS settings. Bitlocker software looks at the BIOS settings and if they change you may need contact your IT support desk for a security code to unlock the system.

2. Read and Execute the Installation Guide, Install the VM

The installation guide is long and ominous looking. Do not despair, if you use the Virtual Machine that has been pre-made for the PetaLinux class much of the work has been already done for you.

Unfortunately Xilinx will not allow us to pre-install the tools and distribute them along with the pre-made Virtual Machine files. This is because of their licensing policies.

IMPORTANT TIME SAVER: If you are going to use the highly suggested pre-made VM file: when you read and execute the installation instructions: we have highlighted the necessary sections in yellow. If a section header is highlighted, you must execute the entire section up to the next section header. If you desire to do it all from scratch follow the entire instructions.

o **Download the VirtualBox and Xilinx tools Installation PDF**

https://docs.avnet.com/amer/smart_channel/VirtualBox_Installation_Guide_2017_1_PetaLinux_Speedway.pdf

o **Download the Pre-made Virtual Box (Highly suggested vs starting from scratch, the instructions document both)**

The download is 2GB, unzipped it will become 6GB. Once the tools are installed it will grow to about 60GB when running the class labs. You will also need to leave your host OS some space, you should have ideally at least 100GB initially free if you are installing on the host OS's hard disk. The pre-built VM file can grow up to 200GB if needed.

The login information for this virtual machine is:

User: **training**
Password: **avnet**

Note: Unzip this to where you are planning to execute the VM from. This can be a different hard drive than where the VirtualBox software is installed.

https://docs.avnet.com/amer/smart_channel/Ubuntu_16.04_MiniZed_PetaLinux_Speedway_Virtual_Box.zip

Please read the installation guide and setup your own Ubuntu Virtual Machine using the pre-made Speedway VM.

Equipment Checklist

You MUST bring the following with you to the training, they will not be provided:

- ✓ Your laptop/PC with the tools pre-installed via the prior instructions!
- ✓ Two micro-USB cables.
- ✓ USB Flash drive. You will be copying a Linux image from your Flash drive onto the MiniZed eMMC memory. <u>FAT32 or FAT Format is the only format that will work!</u>
- ✓ If your Flash drive and/or micro-USB cable are extra wide, a Type A USB extension.
- ✓ TE Connectivity HTU21D Humidity and Temperature PMOD Sensor.

MiniZed with two USB cables and Flash drive plugged in
(Note the little space between USB devices)
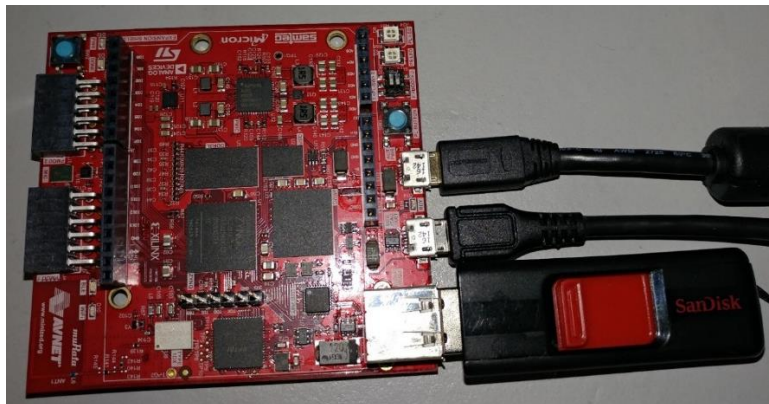
MiniZed with TE PMOD HTU21D Sensor
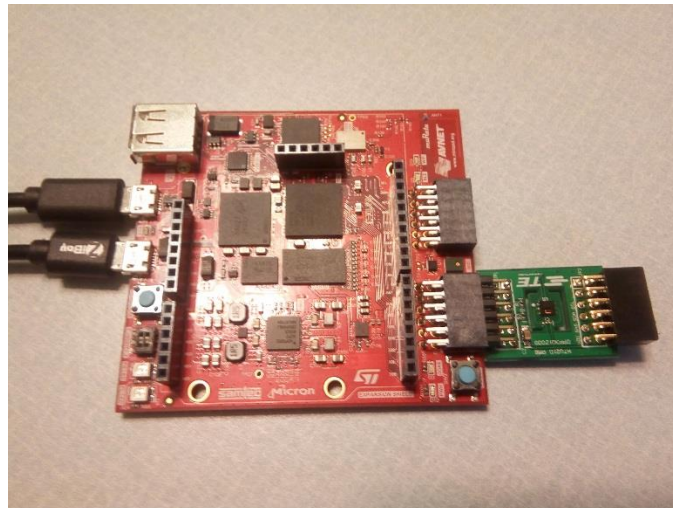
Revision History

Date	Version	Revision
Sept 2017	1.0	Boston PetaLinux Speedway