Networking Level Laboratory

Mica-Motes Family:

Configuration and Driver Installation

Purpose/Objective:

Learn how to install and setup the virtual COM port for MIB520 USB-based programming board for Mica Motes family. This lab depends on the successful installation of virtual machine of Osian Linux within Virtual Box and TinyOS.

1. Installing VCP Driver for MIB520

Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the computer. Application software can access the USB device in the same way as it would access a standard COM port.

To use MIB520 as programming board, you need to install FTDI FT2232C to use the USB port as virtual COM port on your machine. The WHQL zip file below is for both 32-bit and 64-bit OS. You can also find the most up to date driver from http://www.ftdichip.com/Drivers/VCP.htm and choose the one fit for your OS.

We will use Windows 7 as example in the manual. Figure 1 shows the screenshot when accessing the FTDICHIP.com. For Windows 7, double click on the link to the setup executable – indicated by red circle.

Figure 1. Virtual COM Port Website

After successful download, double click on the application (.exe) file, and the driver will be installed. Now start the Virtual Box and TinyOS. Check the "Devices" tab on top of the Virtual Box, you will see the MIB520 listed under the USB list – as indicated by the red circle (Figure 2).
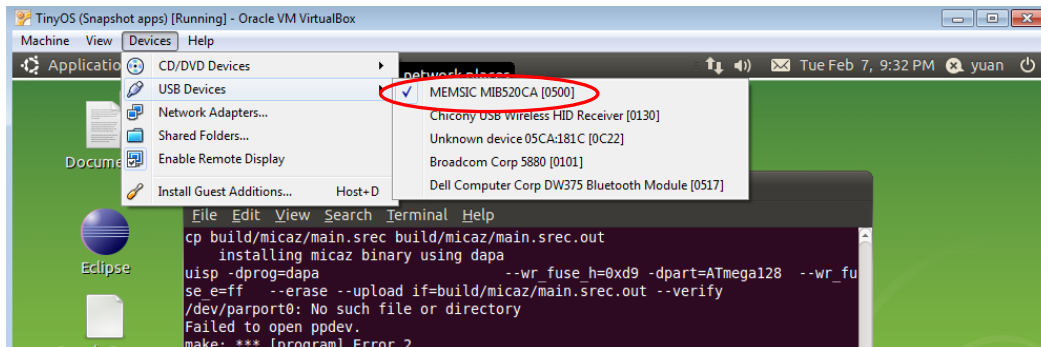

Figure 2 MIB520 shown on the USB Devices List in TinyOS on Virtual Box

You can find installation guide for other operating system from
http://www.ftdichip.com/Support/Documents/InstallGuides.htm

2. Testing Installation: Load a Program onto a MicaZ node via MIB520

With the successful installation of virtual machine and the installation of virtual COM port for MIB520, it is now possible to start working with Family of Mica motes. To verify the virtual COM port driver for MIB520 is installed properly, we will load the Blink application into MicaZ nodes via MIB520.

1. Plug the Tmote into an available USB port on your computer;

2. Give the Virtual Machine control of the mote;

3. Go to the devices menu on the VM's window -> Under USB devices, the Tmote should show up, select the Tmote;

4. In the VirtualBox TinyOS, launch a terminal.

5. Change the active directory to '**/opt/tinyos-2.x/apps/Blink'**

6. Use the command '**make micaz install.1 mib510,/dev/ttyUSB0**' to load "Blink" program into the MicaZ via MIB520;

7. Once the program is finished downloading the mote should execute the program. That is, the 'Blink' program blinks the onboard LEDs.

Congratulations! You just verified that the virtual COM port for MIB520 is installed correctly.

Note: the number '1' after 'install' in the 'make' command in step xx indicates it is the first node. You can program multiple mica nodes with the same application by specify the node ID.

Post-Lab Questions (Due Feb. 14):

1) Study the files in Blink Application folder, identify the components and the functions of the components it uses, construct the linkage file for the Blink Application – see WSN Software Platform lecture slides for example.
2) Read the tos.h file and identify global variables TinyOS use.