How to Install Tiny OS

Here is a guide to help you to prepare for Programming tasks

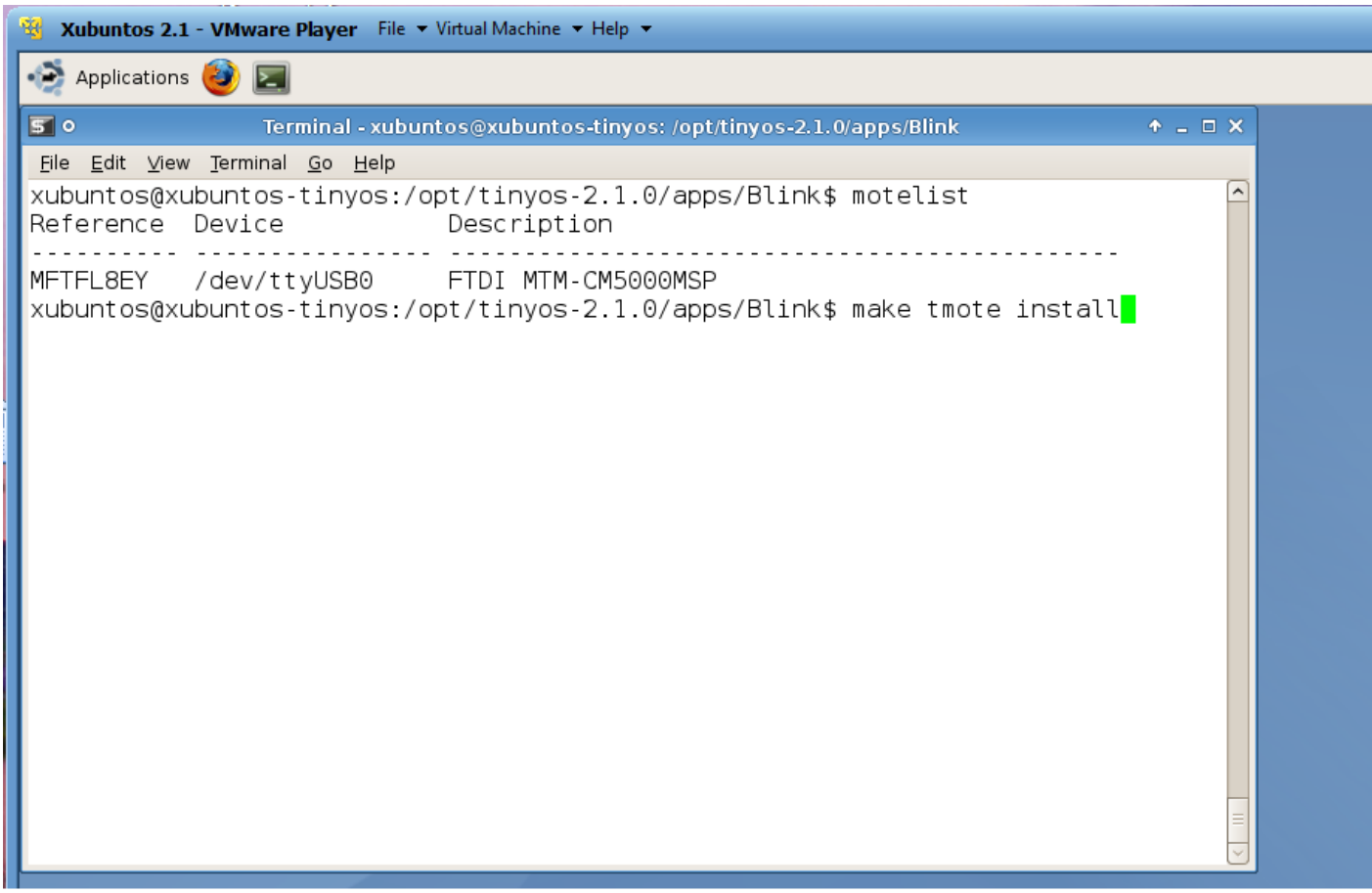
1. Download and install an image viewer
    a. for windows and linux users: vmware player.
    b. for mac users: virtualbox
2. Download tinyos image
    a. guide for windows and linux users : Xubuntos on vmware
    b. guide for mac users: Xubuntos on virtualBox
3. [optional] Install TinyOs directly:
    a. guide for Ubuntu users: http://www.electronicspub.com/article/28/TinyOS-installation-guide-on-Ubuntu.html
    b. guide for mac users(a bit advanced): http://olafland.wordpress.com/2012/06/25/tinyos-on-mac-os-x-10-7-lion/).

How to run a test application

Now we want to connect a sensor node and run a test application

1. Connect the motes to the USB port and acticvate them. To connect to motes, you will have to tell the virtual machine that you would like it to recognize them. Once you have your motes connected and you have started XubunTOS, you can select which ones you would like to connect to. They should be listed at the top of the screen, with depressed buttons indicating a connection, and undepressed buttons indicating that no connection has been made. You may connect or disconnect them as you wish.
2. Go to test folder by typing following line in the Terminal environment
   cd /opt/tinyos-2.1.0/apps/Blink
3. Test if the motes are connected by following line
   motelist
4. Make and install the Blink app on the mote by following code
   make tmote install

   Now your mote should blink!!!



Homework Task

Extend the AntiTheft application that you have implemented in the lecture session. The requirement for the homework is as following. Whenever, a Mote gets stolen. i.e., it loses light (TSR or PAR sensors), The mote turns on a LED. Meanwhile, It will send a broad cast message to the other nodes indicating that it is stolen. Other nodes when receive a theft message turn on another LED (like red when node itself is stolen and blue if another one is stolen). Make sure that whenever the nodes are released (are taken out from the pocket) they need to turn off the LEDs. Hint: In this case they might send another broadcast message to the network indicating that they are released!!
In following you will find some usefull hints to help you in your task

How to istall a program on a Telosb mote?

- make telosb install, bsl 0, /dev/ttyUSB0

what is the Photo sensor class for telosb motes?

- HamamatsuS1087ParC

What Components do I need to be able to send and receive broadcast messages?

- components ActiveMessageC;
- components new AMSenderC(myID) as Sender;
- components new AMReceiverC(myID) as Receiver;

What Interfaces do I need to implement for broadcasting?

- interface SplitControl as AMControl;
- interface Packet;
- interface AMSend;

What are the appropriate settings for Make file

```
1. COMPONENT=MyTheftAppC
2. include $(MAKERULES)
3. # msg size up to 127
4. MSG_SIZE=64
5. # channels from 11 to 30
6. CFLAGS+=-DCC2420_DEF_CHANNEL=29
7. # transmission power from 1 to 31
8. CFLAGS+=-DCC2420_DEF_RFPOWER=27
```

How to wire message sending components into MyTheftApp?

- MyTheftAppC.AMControl ⇒ ActiveMessageC;
- MyTheftAppC.Packet ⇒ ActiveMessageC;
- MyTheftAppC.AMSend ⇒ Sender;
- MyTheftAppC.Receive ⇒ Receiver;

Reference

Use RadioSenseToLeds app under tinyOs totorial as a base for your implementations!.