Lab Zero

Purpose:

This lab provides a first hands-on lab experience for the students.   Note: there is NO credit for this lab.   After this lab the student should be able to perform following

tasks independently.

⊕Connect the hardware devices together.
⊕Compile existing code on the PC side.
⊕Wirelessly download the code from the PC to the sensor devices (MicaZ motes) for execution.

Pre-lab Suggestions:

Read the LiteOS user's manual on how to install LiteOS onto MicaZ motes, and how to set up your compiling environment. Install the LiteOS base onto two motes, using a radio channel that is assigned. Make sure that you should get a unique channel to use, so that your experiments will not interfere with others. These two nodes should be named nodeA and nodeB, respectively, and should form a network called sensornet1 (or any other name you choose).

In-lab Procedure:

[Instructions]

1. Connect the hardware devices.
2. Open the Cygwin shell window.
3. In the Cygwin shell window, navigate to the pre-installed LiteOS directory,   using the command: "cd c:/LiteOS"

4. In the Cygwin shell window, start the serial forwarder. First, navigate to the JavaTools/classes directory using the following command:"cd JavaTools/classes", then use the following command: "java tools.sf.SerialForwarder -comm serial@[YOUR PORT]:57600". Here

[YOUR PORT] should be replaced with the particular port number your programming board uses (COM1 for MIB510).

5. Next open another Cygwin window as in Setp 2.

6. In the Cygwin shell window, navigate to the JavaTools/classes directory again using the following command: "cd c:/LiteOS/JavaTools/classes", then use the following command
"java tools.terminal.terminal" to start the LiteOS terminal.

7. Open a third cygwin window.   Navigate to C:/LiteOS/Apps/Apps/Blink directory using the following command: "cd c:/LiteOS/Apps/Apps/Blink"

8. Compile the code by using the following command. The details of this command is discussed in the LiteOS programming guide.

"build -flash_page=320 -ram_start=2800 -ram_size=512 blink.lhex"

9. Now switch back to the terminal window you opened in Step 6. Use the following commands to connect to the sensor network. You should have three nodes available to you, one base station connected with MIB510 programming board, and two nodes for installing applications.

LiteOS Version 0.3
$setchannel [YOUR CHANNEL HERE]

$ls -l
The returned has 2 packets.
Name Type Size Protection
sensornet1 network -- rwxrwxrwx
Time elapes 547

$cd sensornet1
cd command successful
Time elapes 0

$ls -l
The returned has 2 packets.
Name Type Size Protection
nodeB noderoot -- rwxrwxrwx
nodeA noderoot -- rwxrwxrwx
Time elapes 500
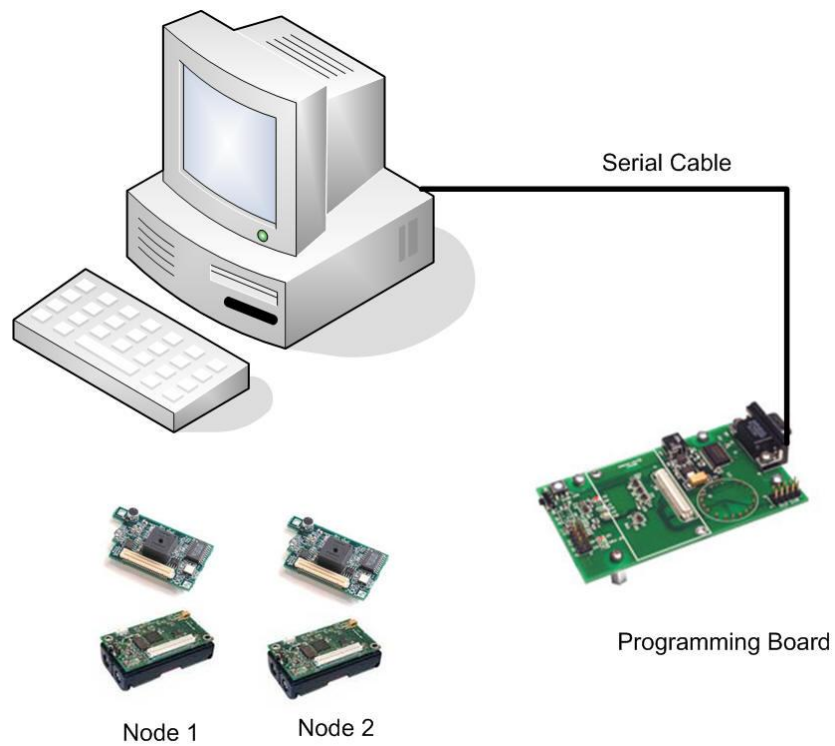
$cd nodeA

cd command successful
Time elapes 0

$ls -l
The returned has 1 packets.
Name Type Size Protection
dev directory -- rwxrwxrwx
Time elapes 516

10. You have entered into the root directory of nodeA. Now copy the blink.lhex file you have compiled to sensor network node A.
"cp /c/LiteOS/Apps/Apps/Blink/build/blink.lhex blink"

11. Next start the blink application "exec blink"

12. If everything is fine, you will see the red LED light up every second - congratulations! Watch the status of blink by using the following command.

13. Copy the blink application to another node, nodeB, and by using the following commands.
cd ..
cd nodeB
cp /c/LiteOS/Apps/Apps/BlinkBasic/build/blink.lhex blink
exec blink
ps

14. (Optional) You may try other commands following the LiteOS user guide after you finish the above steps.

15. To clean up, disconnect the devices.

Serial Cable

Programming Board

Node 1   Node 2

After-Lab Deliverables:

⊕None