University of Florida   EEL 4744   Drs. E M. Schwartz & K. Gugel
Department of Electrical & Computer Engineering   TAs: W. Goh & Colin Watson
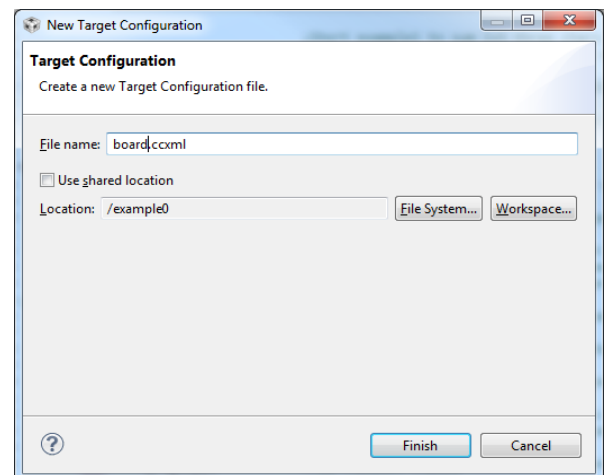Page 1/2   Revision 0   12-Feb-12

Emulating an ASM Project in CCS

Introduction

There are two types of debugging modes that we can use: ***real hardware*** (which we will call ***emulation***) or with a ***simulator***. Which one is used is dependent on the active target configuration file. In the *Create and Simulate ASM CCS Project* tutorial, we created a target configuration file for the simulator; here we will create a target configuration to debug on the hardware, i.e., an emulator. In the case of hardware debugging, we attach our lab board to our laptop running CCS and download and step through our assembly code *on the board*. In the case of simulated debugging, we step through our assembly code using the simulated debugger feature found in CCS. Now we will now create another target configuration file so that hardware debugging (emulation) will be possible.

The purpose of this document is to enable a student to quickly emulate (i.e., run with the debugger on the actual hardware) a project under CCS that has already been built and simulated. It is assumed that you have already completed the tutorial Create_Simulate_ASM_CCS_Project.pdf. To complete this tutorial you will need to have previously created the example0 project discussed in this previous tutorial (with the two files **ex0.asm** and **KG_RAM_Link1.cmd**).

Procedure

1. This tutorial assumes that you already have Code Composer Studio installed and have set your workspace folder location on your hard disk. For more information on this topic see the tutorial CCS_Installation_Instructions.pdf (at http://mil.ufl.edu/4744/docs/CCS_Installation_Instructions.pdf).

2. This tutorial assumes that you already have created the example0 project discussed in Create_Simulate_ASM_CCS_Project.pdf (at http://mil.ufl.edu/4744/docs/Create_Simulate_ASM_CCS_Project.pdf).

3. Open the CCS project example0 (or ex0). It should already be available in the Project Explorer window.

4. Create a new Target Configuration File by pressing **File → New → Target Configuration**. The target configuration file will identify the type of emulator CCS will use for programming and emulating the DSP board, i.e., it tells CCS where to load the program. In our case the programmer/emulator hardware is actually on our lab board.

Type in a filename **Board** to match target's location; the ccxml file extension is automatically added. Next, un-check the **Use shared location** box and then press **Workspace** to select the current project location. If the current project location shows up in the "Location:" field (i.e., /example0), you can leave **Use shared location** checked and just press **Finish**. We want to make sure we add the target configuration file to our current project files. Click **Finish** after the location and filename have been set.

University of Florida   EEL 4744   Drs. E M. Schwartz & K. Gugel
Department of Electrical & Computer Engineering   TAs: W. Goh & Colin Watson
Page 2/2   Revision 0   12-Feb-12

Emulating an ASM Project in CCS

5. For the Board.ccxml file look under "Basic" for "General Setup" and then for "Connection." Select **Texas Instruments XDS100v1 USB Emulator** in the **Connection** pull-down. Next check the **TMS320F28335** device in the **Device** scrollbar area (near the bottom). See the correct settings to the right. Our target D SP is the F28335 and the emulator circuitry we have placed on the lab board is equivalent to that used by the XDS100 originally designed as a stand-alone programmer by TI.

   Select "Save" under "Save Configuration." You can now close this window since no future modifications will be made to it when you are writing new code or debugging machine code.

6. This project has already been built (assembled & linked), but can be rebuilt as follows. Select the hammer icon 🔨, or **Project ➔ Build Project**, or right click the project in the Project Explorer window and click Build Project. You should see zero errors and warnings when you build the project containing ex0.asm and you should also see that a machine code output file is generated called example0.out

7. Select the configuration file that you set up for the programmer/emulator by right-mouse clicking on the appropriate file and selecting **Set as Active Target Configuration**. For example 0, this file was called board.ccxml (not NoBoard.ccxml).

8. The rest of the debug process is exactly identical to what you did in steps 10 through 14 of the *Create and Simulate ASM CCS Project* document.