Developing a New BSP

MQX 3.8.1, CodeWarrior IDE

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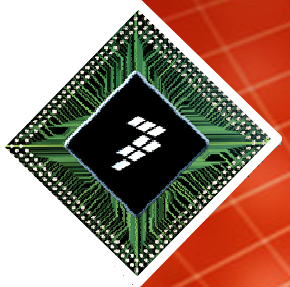


Updated November 2012

1. Select and copy baseline BSP to modify

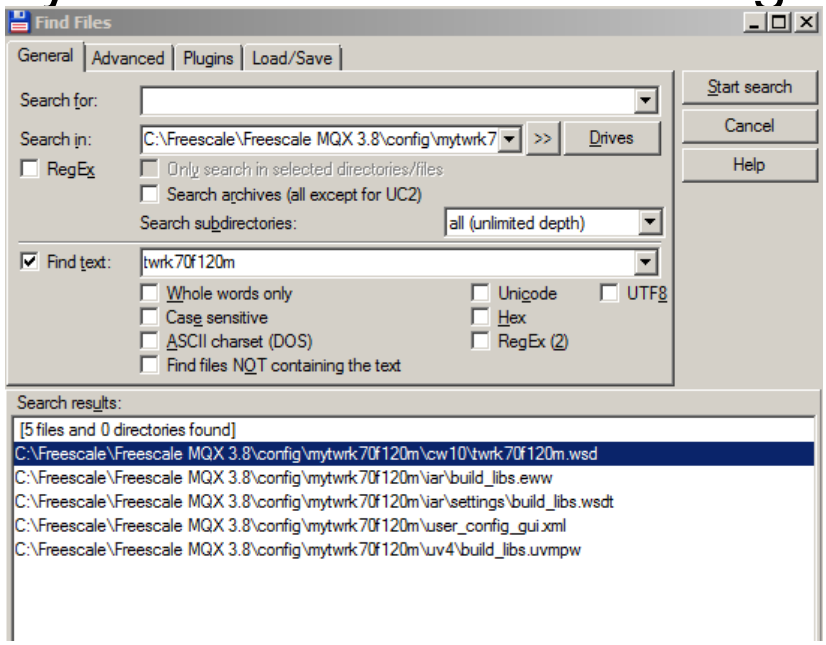
- Create a new BSP source directory
  - mqx\source\bsp\mytwrk70f120m
- Copy all content from baseline directory to the new directory
  - Copy *.* including subfolders
    - From: mqx\source\bsp\twrk70f120m
    - To: mqx\source\bsp\mytwrk70f120m

2. Rename board-specific header files

- Rename
  - \mqx\source\bsp\mytwrk70f120m\twrk70f120m.h
- To new name
  - \mqx\source\bsp\mytwrk70f120m\mytwrk70f120m.h
- Search in all files in the new BSP \mqx\source\bsp\mytwrk70f120m\ and replace original header file with the name of the new header file
  - \mqx\source\bsp\mytwrk70f120m\bsp.h
  - Find #include line of the original board specific header file
    - #include <twrk70f120m.h>
  - change it to the new header file (save changes)
    - #include <mytwrk70f120m.h>

3. Create additional files and directories related to the new BSP (1)

- new BSP configuration directory
  - Create \config\mytwrk70f120m\
  - Copy *.* from original configuration to the new configuration
    - From: c:\Freescale\Freescale MQX 3.8\config\twrk70f120m\
    - To: c:\Freescale\Freescale MQX 3.8\config\mytwrk70f120m\
- Search in all files in \config\mytwrk70f120m\ for the original board name “twrk70f120m”
- Results are files related to the IDE (build projects for IAR, Keil and CodeWarrior)
- For CW, in interest are:
  - User_config_gui.xml
  - Cw10\twrk70f120m.wsd



3. Create additional files and directories related to the new BSP (2)

- Rename \config\twrk70f120m\cw10\twrk70f120m.wsd to new name: \config\mytwrk70f120m\cw10\mytwrk70f120m.wsd
- Edit mytwrk70f120m.wsd
  - Find and replace all occurrences of "_twrk70f120m" to the new name "_mytwrk70f120m"
- Edit \config\mytwrk70f120m\user_config_gui.xml
  - Replace line:
    - <path>mqx\source\bsp\twrk70f120m\twrk70f120m.h</path>
  - With new bsp and new board specific header file name:
    - <path>mqx\source\bsp\mytwrk70f120m\mytwrk70f120m.h</path>

3. Create additional files and directories related to the new BSP (3)

- Create new build output directory
  - c:\Freescale\Freescale MQX 3.8\lib\mytwrk70f120m.cw10\
- We can leave this folder empty. This is the output folder for the build process of MQX libraries for this board.
- When we will be ready for building, as part of post build steps, all MQX header files *.h and MQX library files *.a will be stored into this output directory.
- User application for this new board then include and link header files and libraries from the new folder. This is shown on next pages.

Cloning Existing MQX libs configuration (1)

- For background, text from MQX User Guide Rev.4:
  - "Using an example of M52259EVB board, the following items depend on the board's name:
    - User configuration is taken from config\<board> directory (for example config\m52259evb).
    - Build project include-search paths are set to point to the user configuration directory.
    - Build projects are set up to produce resulting binary library files in lib\<board>.<compiler> output directory (for example lib\m52259evb.cw).
    - Build projects are named to reflect the board name mqx\build\<compiler>\bsp_<board>.<prj> (for example mqx\build\cwcf72\bsp_m52259evb.mcp)
    - Post-link batch files set in build projects are also specific to the board. (for example mqx\build\bat\bsp_m52259evb.bat)."

Cloning Existing MQX libs configuration (2)

- User configuration is taken from board specific config\<board> directory
  - c:\Freescale\Freescale MQX 3.8\config\twrk70f120m\
- Our goal is to change MQX libraries build projects for the new board to take User configuration from our new directory
  - c:\Freescale\Freescale MQX 3.8\config\mytwrk70f120m\
  - Build project include-search paths are set to point to the user configuration directory – we will change include search paths.
- Build projects are set up to produce resulting binary library files in lib\<board>.<compiler> output directory
  - c:\Freescale\Freescale MQX 3.8\lib\twrk70f120m.cw10\
- We need to change our new build projects for the new board to produce resulting *.h and *.a files to our new directory
  - c:\Freescale\Freescale MQX 3.8\lib\mytwrk70f120m.cw10\

Cloning Existing MQX libs configuration (3)

- Build projects are named to reflect the board name mqx\build\<compiler>\bsp_<board>.<prj>
  - c:\Freescale\Freescale MQX 3.8\mqx\build\cw10\bsp_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\mqx\build\cw10\psp_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\rtcs\build\cw10\rtcs_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\mfs\build\cw10\mfs_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\shell\build\cw10\shell_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\usb\host\build\cw10\usb_hdk_twrk70f120m\
  - c:\Freescale\Freescale MQX 3.8\usb\device\build\cw10\usb_ddk_twrk70f120m\

Cloning Existing MQX libs configuration (4)

- Post-link batch files set in build projects for PSP and BSP are also specific to the board.
  - c:\Freescale\Freescale MQX 3.8\mqx\build\bat\bsp_twrk70f120m.bat
  - c:\Freescale\Freescale MQX 3.8\mqx\build\bat\psp_twrk70f120m.bat

Cloning Existing BSP build project for CW10

- Create new directory for the new build project
  - \mqx\build\cw10\bsp_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \mqx\build\cw10\bsp_twrk70f120m\
  - To: \mqx\build\cw10\bsp_mytwrk70f120m\
- Edit \mqx\build\cw10\bsp_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \mqx\build\cw10\bsp_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \mqx\build\cw10\bsp_mytwrk70f120m\.ProcessorExpert.g_c
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing PSP build project for CW10

- Create new directory for the new build project
  - \mqx\build\cw10\psp_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \mqx\build\cw10\psp_twrk70f120m\
  - To: \mqx\build\cw10\psp_mytwrk70f120m\
- Edit \mqx\build\cw10\psp_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \mqx\build\cw10\psp_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing MFS build project for CW10

- Create new directory for the new build project
  - \mfs\build\cw10\mfs_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \mfs\build\cw10\mfs_twrk70f120m\
  - To: \mqx\build\cw10\mfs_mytwrk70f120m\
- Edit \mfs\build\cw10\mfs_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \mfs\build\cw10\mfs_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing RTCS build project for CW10

- Create new directory for the new build project
  - \rtcs\build\cw10\rtcs_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \rtcs\build\cw10\rtcs_twrk70f120m\
  - To: \rtcs\build\cw10\rtcs_mytwrk70f120m\
- Edit \rtcs\build\cw10\rtcs_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \rtcs\build\cw10\rtcs_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing SHELL build project for CW10

- Create new directory for the new build project
  - \shell\build\cw10\shell_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \shell\build\cw10\shell_twrk70f120m\
  - To: \shell\build\cw10\shell_mytwrk70f120m\
- Edit \shell\build\cw10\shell_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \shell\build\cw10\shell_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing USB HDK build project for CW10

- Create new directory for the new build project
  - \usb\host\build\cw10\usb_hdk_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \usb\host\build\cw10\usb_hdk_twrk70f120m\
  - To: \usb\host\build\cw10\usb_hdk_mytwrk70f120m\
- Edit \usb\host\build\cw10\usb_hdk_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \usb\host\build\cw10\usb_hdk_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing USB DDK build project for CW10

- Create new directory for the new build project
  - \usb\device\build\cw10\usb_ddk_mytwrk70f120m\
- Copy baseline build project *.* including subfolders to the new directory
  - From: \usb\device\build\cw10\usb_ddk_twrk70f120m\
  - To: \usb\device\build\cw10\usb_ddk_mytwrk70f120m\
- Edit \usb\device\build\cw10\usb_ddk_mytwrk70f120m\.project
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”
- Edit \usb\device\build\cw10\usb_ddk_mytwrk70f120m\.cproject
  - Find and replace all “twrk70f120m” to “mytwrk70f120m”

Cloning Existing post build batch files for CW10

- Copy existing BSP post build batch file
  - From: \mqx\build\bat\bsp_twrk70f120m.bat
  - To: \mqx\build\bat\bsp_mytwrk70f120m.bat
- Edit, Find and replace all “twrk70f120m” to “mytwrk70f120m” in this file.

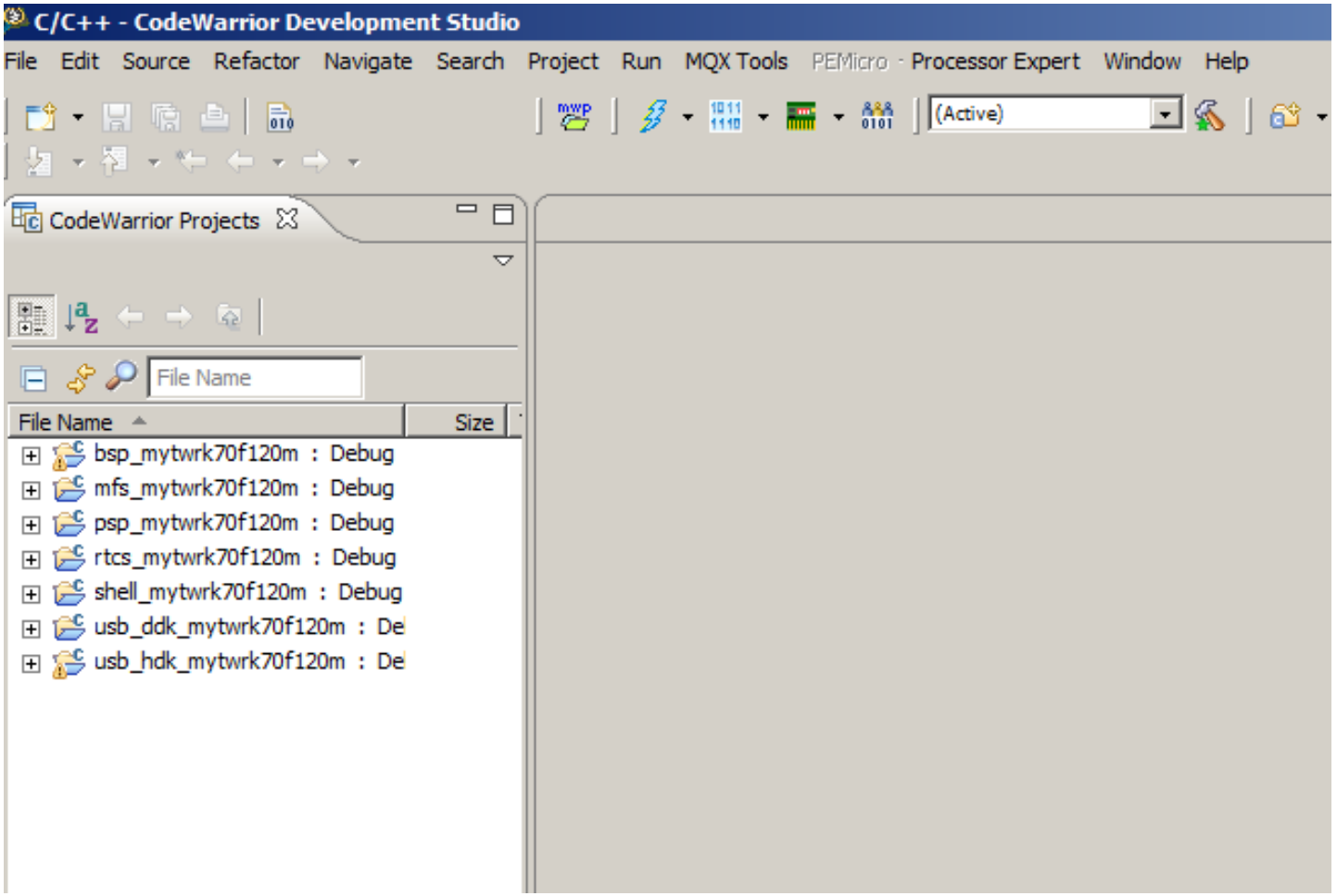
- Copy existing PSP post build batch file
  - From: \mqx\build\bat\psp_twrk70f120m.bat
  - To: \mqx\build\bat\psp_mytwrk70f120m.bat
- Edit, Find and replace all “twrk70f120m” to “mytwrk70f120m” in this file.

Build MQX libraries for our new board (1)

- Now we are ready for build of MQX libs. We have build projects for all MQX libraries and we have new post build batch files.
- Start CW 10.2 IDE, open new workspace, for example C:\Workspace\cw102_mqx381_mytwrk70f120m
- Drag and drop c:\Freescale\Freescale MQX 3.8\config\mytwrk70f120m\cw10\mytwrk70f120m.wsd (drag from Windows Explorer, drop to CodeWarrior Projects window)

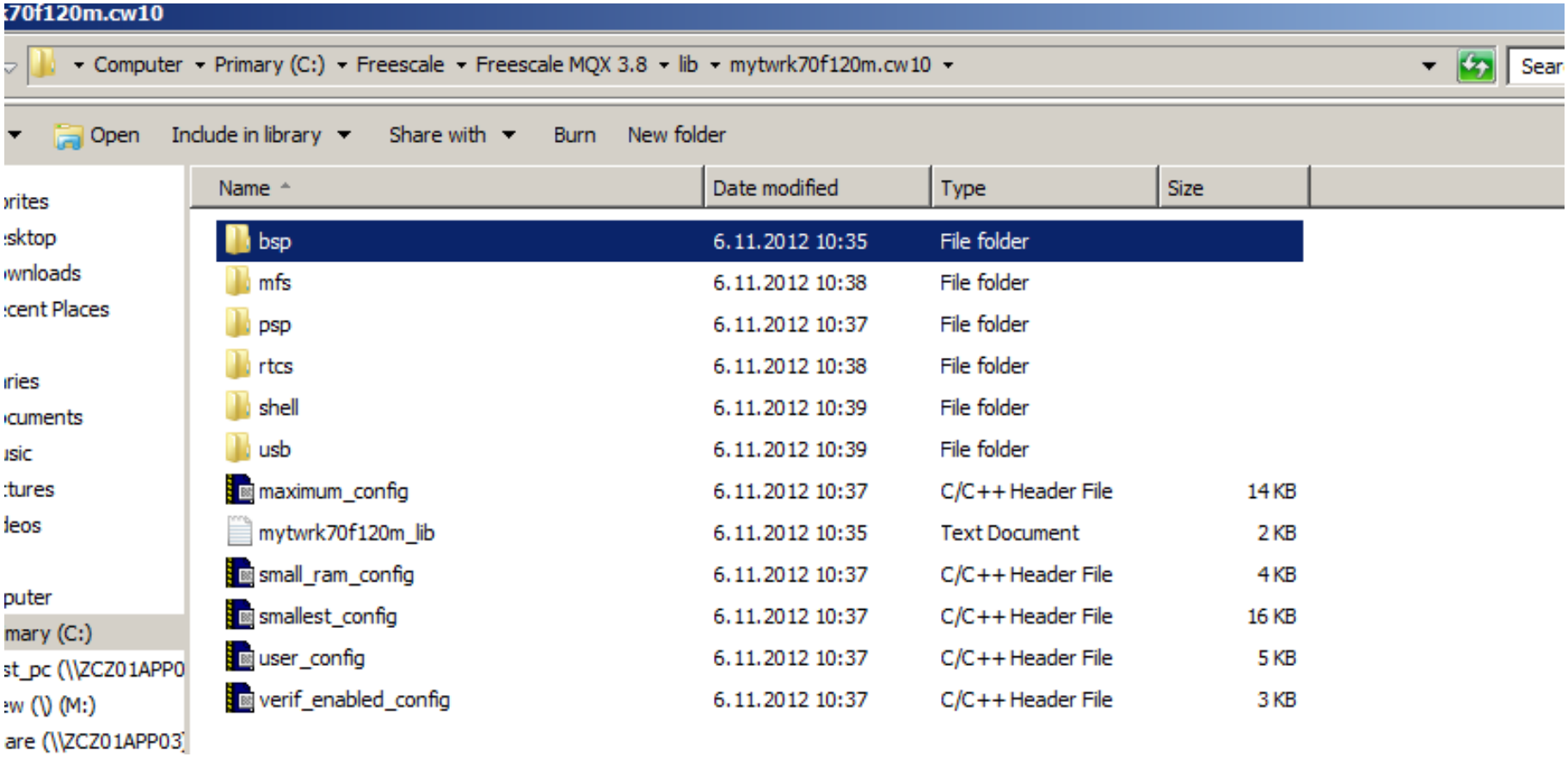
Build MQX libraries for our new board (2)

- Result:



Build MQX libraries for our new board (3)

- Build Debug and Release MQX libraries for mytwrk70f120m



CodeWarrior New Project Wizard (1)

- We are building MQX libraries for our new board. Now we would like to create some MQX applications that will be using our new libraries.
- We will leverage New Project Wizard, which allows to create new MQX 3.8.1 project(s), which can be either empty “hello word from MQX” application or an application based on one of the standard MQX 3.8.1 examples.
- To do this, we need to add our new board into the CodeWarrior new project wizard.

CodeWarrior New Project Wizard (2)

- Data for New Project wizard for MQX 3.8 can be found in:
  - c:\Freescale\CW MCU v10.2\MCU\lib\wizard_data\mqx\3.8\
- Here we copy new project wizard xml configuration file from the baseline board file:
  - From: c:\Freescale\CW MCU v10.2\MCU\lib\wizard_data\mqx\3.8\mqx_TWRK70F120M.xml
  - To: c:\Freescale\CW MCU v10.2\MCU\lib\wizard_data\mqx\3.8\mqx_myTWRK70F120M.xml

CodeWarrior New Project Wizard (3)

- Edit the new xml file as shown below. Need to change ID for the new board, and the new board name.
- Find and replace all occurrences of "ID_BOARD_TWRK70F120M" with "ID_BOARD_MYTWRK70F120M"
- Look for elementChoice name. Change element choice name:

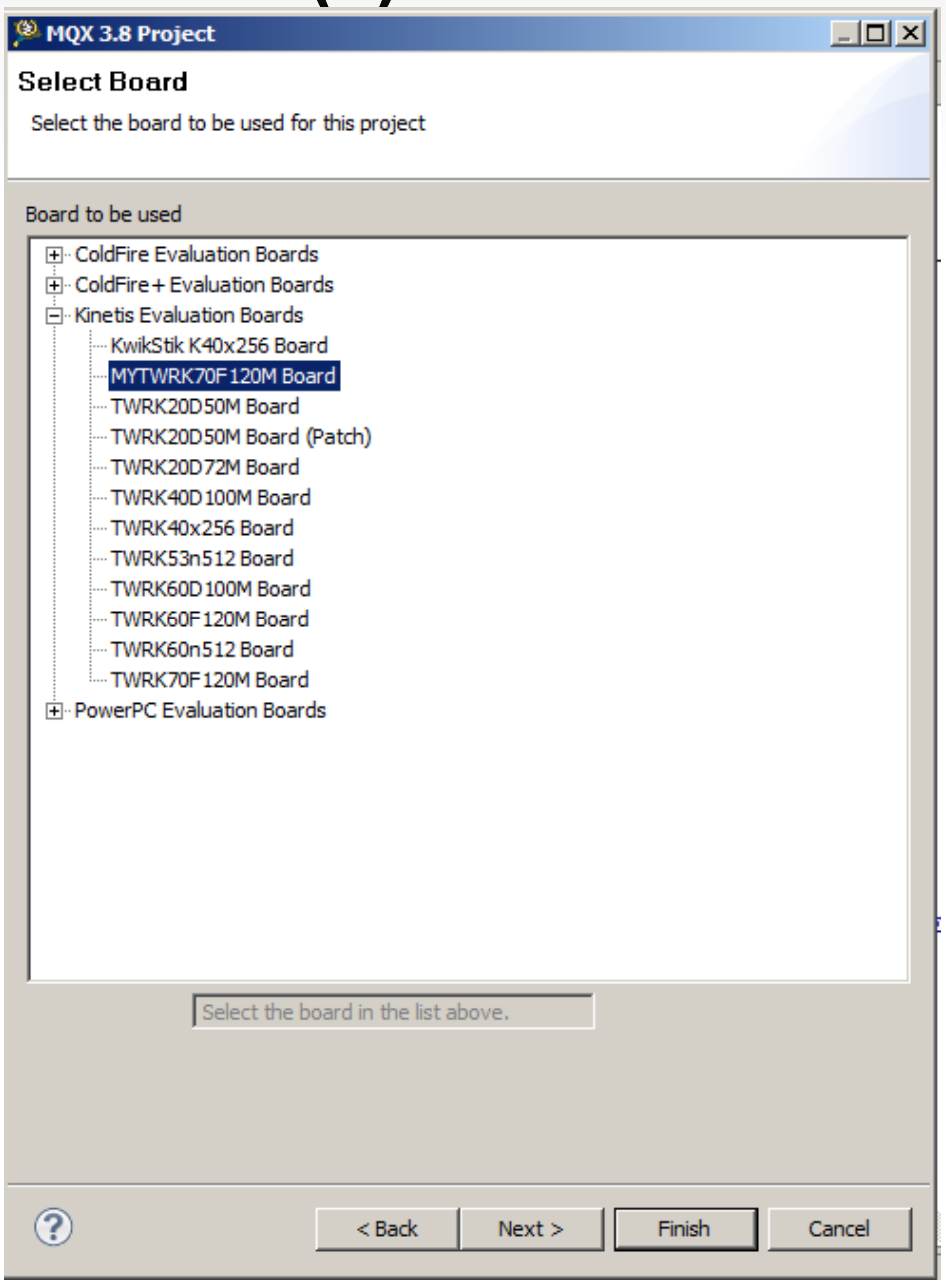
<elementChoice name="MYTWRK70F120M Board"

- Look for <variables> section in the xml file (near the end of the file). Change "BoardName":

<variable name="BoardName" value="mytwrk70f120m"

CodeWarrior New Project Wizard (4)

- Restart the CodeWarrior 10.2 to let it accept our new XML file. After CW restart, we can use New Project wizard to create New MQX 3.8 projects for our new board.
- Try to create new MQX 3.8 project for our new board, based on MQX hello2 example, build and debug.



MQX 4.0

- The manual work shown on the previous pages applies to MQX versions prior to 4.0. Along with MQX 4.0, we release BSP cloning wizard tool which will automate the process of an existing board build projects cloning.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