

Using external GNU toolchain with CodeWarrior for QorIQ LS series – ARMv7 ISA

1. Introduction

This document describes the steps that are required to use external GNU toolchain in conjunction with CodeWarrior for QorIQ LS series – ARMv7 ISA. This is used by Linux version of CodeWarrior.

This document includes the following sections:

- Build the toolchain supplied with Freescale Linux SDK.
- Customize a stationary Linux project to work with the external toolchain.
- Build project using external toolchain.

2. Preliminary background

CodeWarrior for QorIQ – ARMv7 ISA includes Linaro GNU binary toolchain, if you are intending to develop Linux user space application with CodeWarrior is recommended to use the toolchain supplied with the Freescale Linux SDK or the external prebuild toolchain indicated in SDK release.

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3. External toolchain

3.1. Prebuild toolchain

Ensure that you have extracted the Freescale prebuild toolchain on your Linux machine. Current `gcc` version is indicated in SDK release. See [Change toolchain](#) section for using prebuild toolchain as default Build Tool in CodeWarrior.

3.2. Standalone toolchain

Other method to gain an external toolchain is compiling the one provided in SDK. To build and install the standalone toolchain with Yocto, perform these steps:

```
$ bitebake fsl-toolchain
$ cd build_<machine>_release/tmp/deploy/sdk
$ ./fsl-networking-eglibc-<host-system>-<core>-toolchain-
<release>.sh
```

NOTE The default installation path for standalone toolchain is: `/opt/fsl-networking/`. The installation folder can be specified during the installation procedure. Additional information about build and install the standalone toolchain with Yocto can be found on Freescale [infocenter](#).

See [Change toolchain](#) section for using prebuild toolchain as default Build Tool in CodeWarrior.

4. ARMv7 Linux application project

4.1. Stationary project for Linux application

To create an ARMv7 stationary project for Linux application, follow these steps:

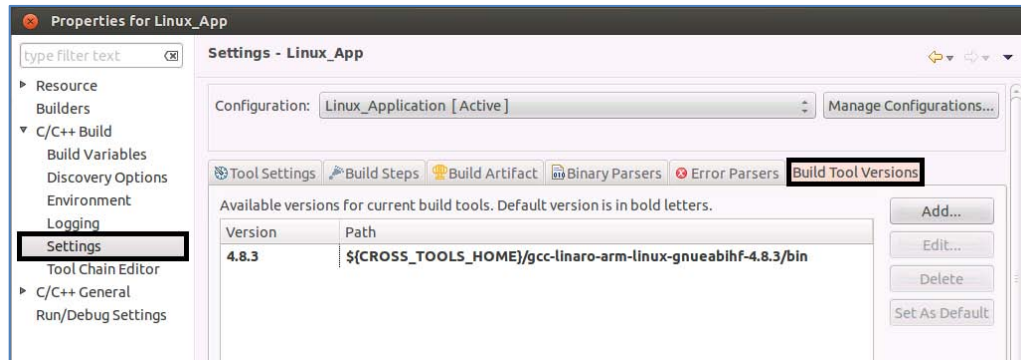
1. Start CodeWarrior for QorIQ LS series - ARMv7 ISA
2. Select **File > New > CodeWarrior Linux Project Wizard**.
3. Specify the **Project name** and **Location**.
4. Select the **Processor** and **Project Output**.
5. Configure **Build Settings**.
6. Configure the connection details and click **Finish** to create the Linux application project.

4.2. Change toolchain

The stationary project for Linux application includes Linaro GNU binary toolchain by default. To change the default toolchain used by CodeWarrior, follow these steps:

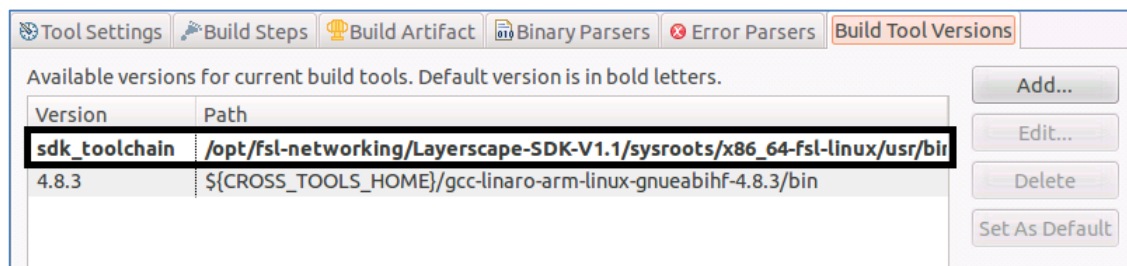
1. Select **Project Properties > Settings > Build Tool Version**.

Figure 1. Project Properties



2. Click **Add** and **Browse** for the new toolchain location. The default installation path for Freescale Linux SDK standalone toolchain is: `/opt/fsl-networking/Layerscape-<release>/sysroot/<host-system>/usr/bin/arm-fsl-linux-gnueabi/`
3. Click **OK** to make the new toolchain available.
4. Select the new toolchain and click the **Set As Default** button. This way, the new toolchain will be the default toolchain for the project.

Figure 2. Build Tool Version dialog



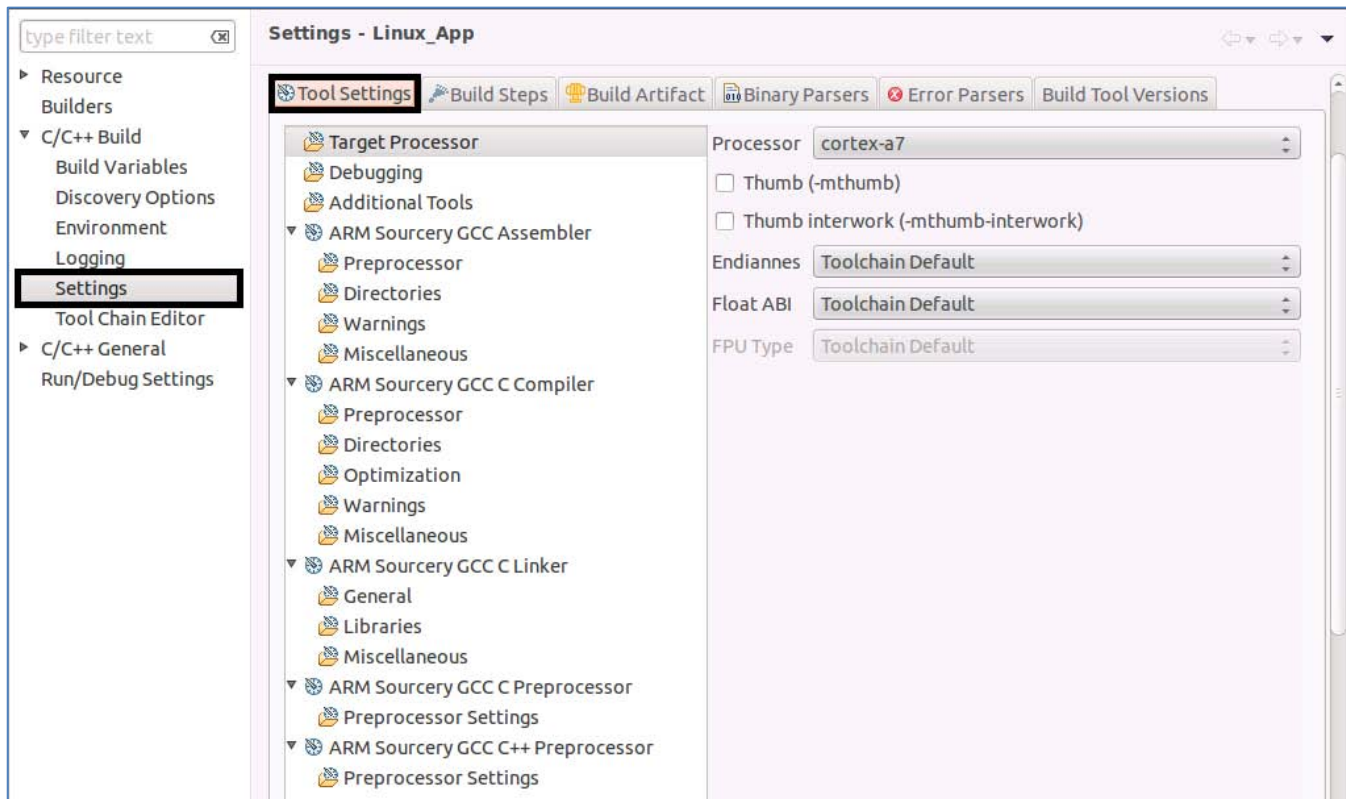
NOTE In CodeWarrior for QorIQ LS series - ARMv7 ISA 10.0.3 release, **Add** option is not available, and a workaround must be used in order to have an external toolchain. Make it as default. See [Change path to toolchain from cwide-env](#) section for details.

4.3. Check build settings

After the external toolchain was selected, the build settings must be checked before the project is build.

1. Select **Project Properties > Settings > Tool Settings**.

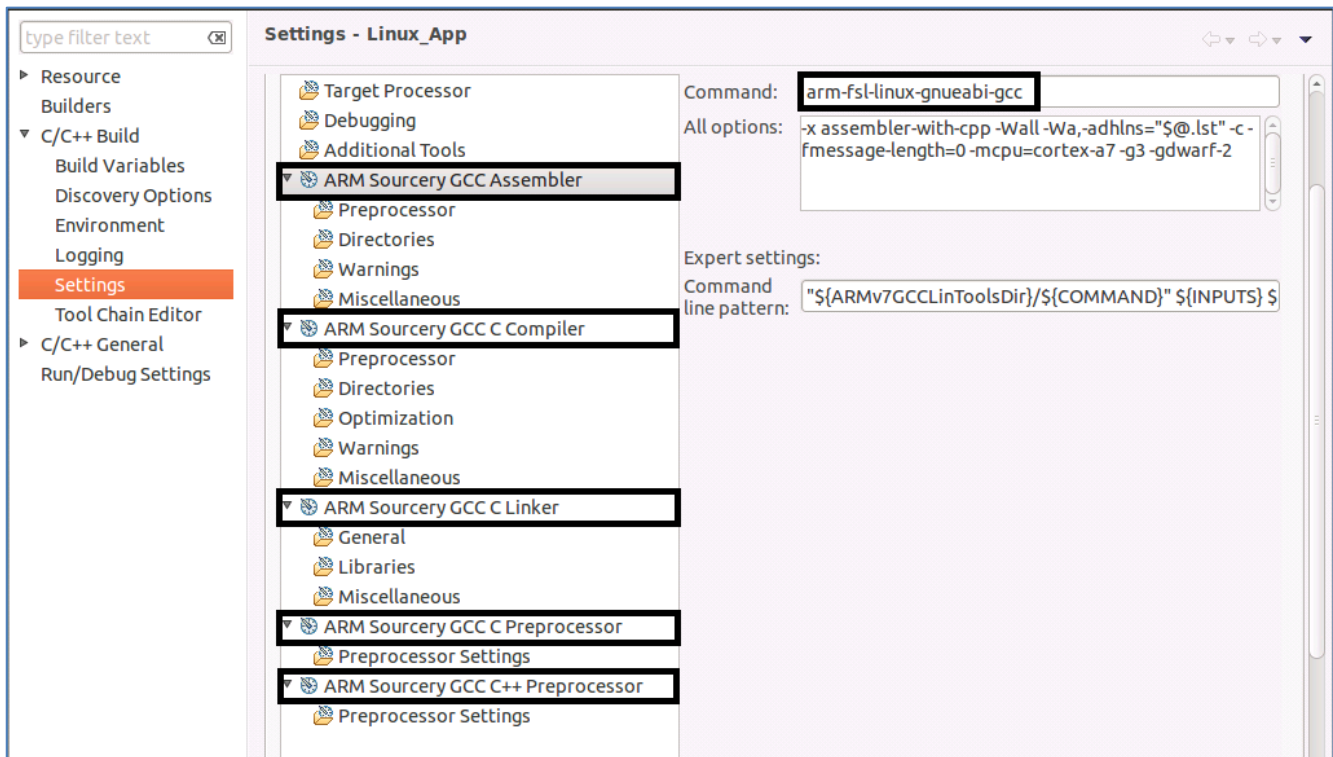
Figure 3.Tool Settings



2. For ARM Sourcery GCC Assembler, C Compiler, C Linker, C Preprocessor, C++ Preprocessor, check the command to be the same as in the external toolchain.

NOTE In the toolchain that is shipped with CodeWarrior, the command is: *arm-linux-gnueabihf-* and in the Freescale SDK Linux toolchain, the command is: *arm-fsl-linux-gnueabi-*

Figure 4. Project Settings



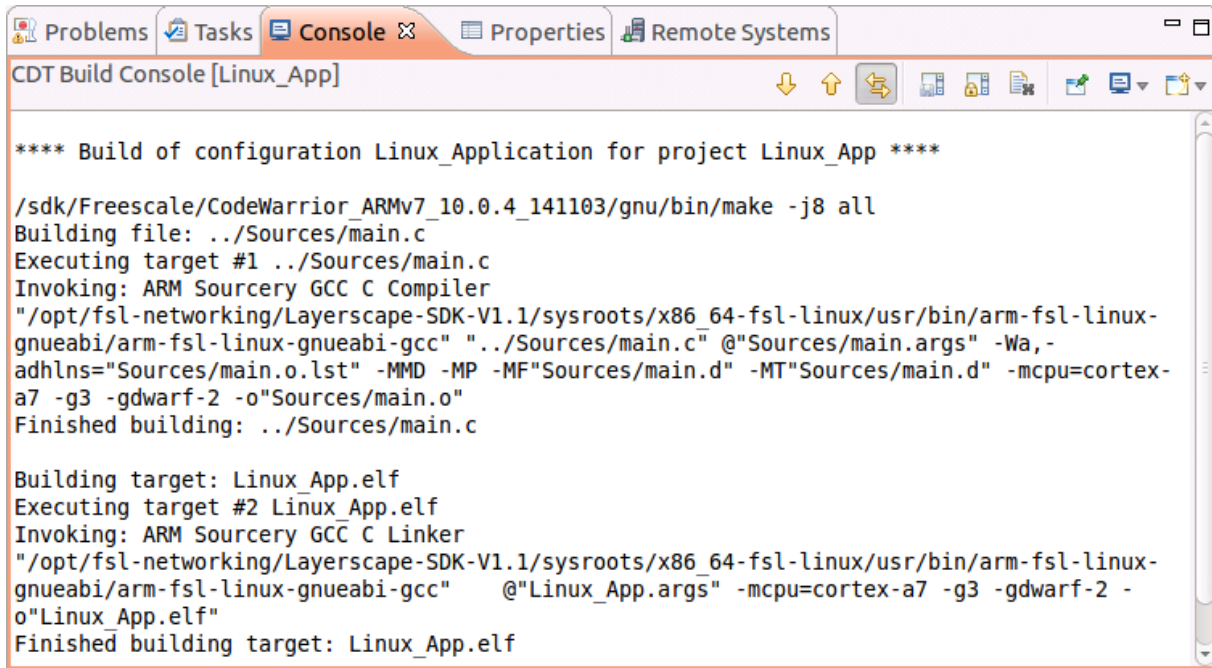
3. Click **OK** to save the project settings.

4.4. Build project using external toolchain

1. Build the project using **Project > Build Project** option.
2. Project should be built with no errors.

Change path to toolchain from cwide-env

Figure 5. Project Console view



```
CDT Build Console [Linux_App]

**** Build of configuration Linux_Application for project Linux_App ****

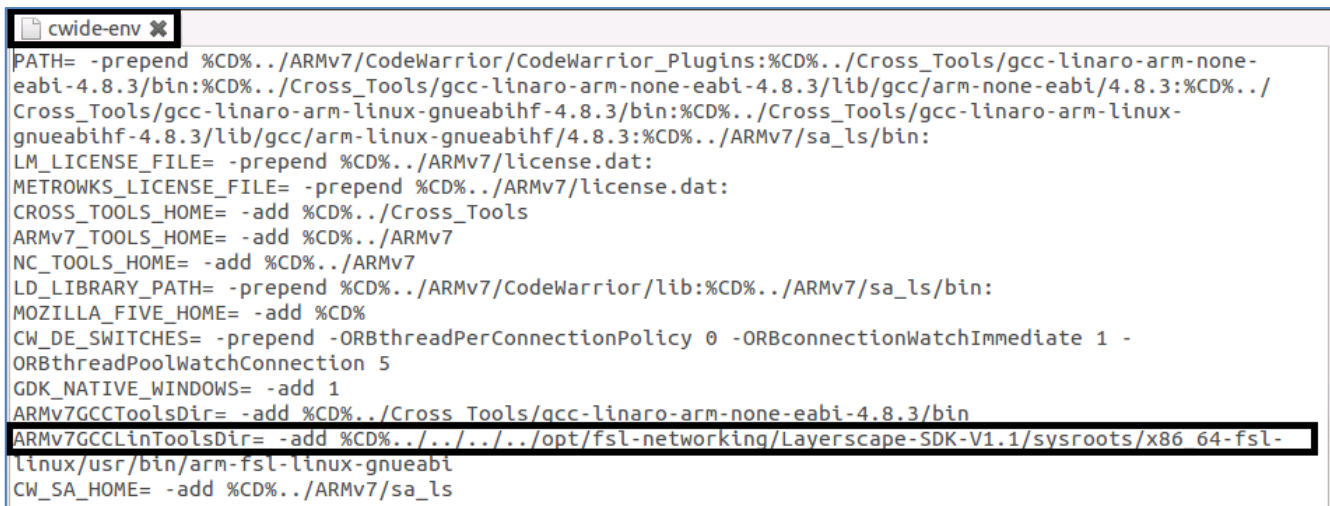
/sdk/Freescale/CodeWarrior_ARMv7_10.0.4_141103/gnu/bin/make -j8 all
Building file: ../Sources/main.c
Executing target #1 ../Sources/main.c
Invoking: ARM Sourcery GCC C Compiler
"/opt/fsl-networking/Layerscape-SDK-V1.1/sysroots/x86_64-fsl-linux/usr/bin/arm-fsl-linux-gnueabi/arm-fsl-linux-gnueabi-gcc" "../Sources/main.c" @"Sources/main.args" -Wa,-adhlns="Sources/main.o.lst" -MMD -MP -MF"Sources/main.d" -MT"Sources/main.d" -mcpu=cortex-a7 -g3 -gdwarf-2 -o"Sources/main.o"
Finished building: ../Sources/main.c

Building target: Linux_App.elf
Executing target #2 Linux_App.elf
Invoking: ARM Sourcery GCC C Linker
"/opt/fsl-networking/Layerscape-SDK-V1.1/sysroots/x86_64-fsl-linux/usr/bin/arm-fsl-linux-gnueabi/arm-fsl-linux-gnueabi-gcc" @"Linux_App.args" -mcpu=cortex-a7 -g3 -gdwarf-2 -o"Linux_App.elf"
Finished building target: Linux_App.elf
```

5. Change path to toolchain from cwide-env

Go to the *eclipse* folder, open *cwide-env* and change the path for *ARMv7GCCLinToolsDir* with the path of the external toolchain.

Figure 6. File Editor



```
cwide-env
PATH= -prepend %CD%../ARMv7/CodeWarrior/CodeWarrior_Plugins:%CD%../Cross_Tools/gcc-linaro-arm-none-eabi-4.8.3/bin:%CD%../Cross_Tools/gcc-linaro-arm-none-eabi-4.8.3/lib/gcc/arm-none-eabi/4.8.3:%CD%../Cross_Tools/gcc-linaro-arm-linux-gnueabi-4.8.3/bin:%CD%../Cross_Tools/gcc-linaro-arm-linux-gnueabi-4.8.3/lib/gcc/arm-linux-gnueabi/4.8.3:%CD%../ARMv7/sa_ls/bin:
LM_LICENSE_FILE= -prepend %CD%../ARMv7/license.dat:
METROWKS_LICENSE_FILE= -prepend %CD%../ARMv7/license.dat:
CROSS_TOOLS_HOME= -add %CD%../Cross_Tools
ARMv7_TOOLS_HOME= -add %CD%../ARMv7
NC_TOOLS_HOME= -add %CD%../ARMv7
LD_LIBRARY_PATH= -prepend %CD%../ARMv7/CodeWarrior/lib:%CD%../ARMv7/sa_ls/bin:
MOZILLA_FIVE_HOME= -add %CD%
CW_DE_SWITCHES= -prepend -ORBthreadPerConnectionPolicy 0 -ORBconnectionWatchImmediate 1 -ORBthreadPoolWatchConnection 5
GDK_NATIVE_WINDOWS= -add 1
ARMv7GCCToolsDir= -add %CD%../Cross_Tools/gcc-linaro-arm-none-eabi-4.8.3/bin
ARMv7GCCLinToolsDir= -add %CD%../../../../opt/fsl-networking/Layerscape-SDK-V1.1/sysroots/x86_64-fsl-linux/usr/bin/arm-fsl-linux-gnueabi
CW_SA_HOME= -add %CD%../ARMv7/sa_ls
```


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