NXP Semiconductors
Application Note

Document Number: ANxxxx

Building Linux Kernel in CodeWarrior ARMv8

1. Introduction

This application note defines guidelines for configuring CodeWarrior for ARMv8 for Linux Kernel development.

This document explains:

- Installing standalone toolchain supplied with NXP Linux SDK
- Configuring CodeWarrior for ARMv8 for building Linux Kernel
- Building Linux Kernel with CodeWarrior for ARMv8

Contents

2. Requirements

For building Kernel using CodeWarrior for ARMv8, is necessary a host computer with Linux OS and CodeWarrior for ARMv8 Linux version installed.

3. Installing SDK standalone toolchain

Linux SDK provides a standalone toolchain which can be used for building different application outside Yocto. In our case, we can use the standalone toolchain for building U-Boot using CodeWarrior for ARMv8.

To build and install the standalone toolchain with Yocto, perform these steps:

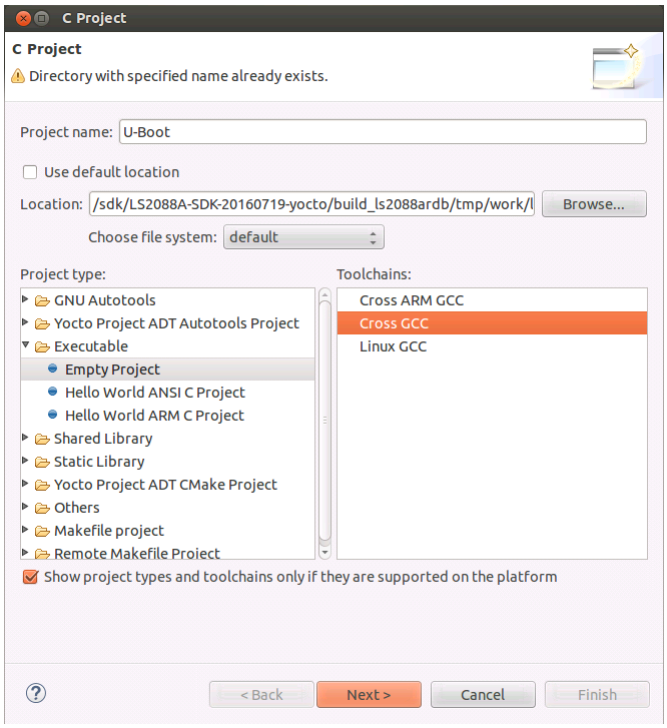
```
$ cd build_<machine>_release
$ bitbake fsl-toolchain
$ cd build_<machine>_release/tmp/deploy/sdk
$ ./fsl-qoriq-glibc-<host-system>-<core>-toolchain-<release>.sh
```

NOTE	The default installation path for the standalone toolchain is: `/opt/fsl-qoriq/`. You need to specify this path while installing the standalone toolchain. For additional information about building and installing the standalone toolchain with Yocto, see **SDK Knowledge Center**.

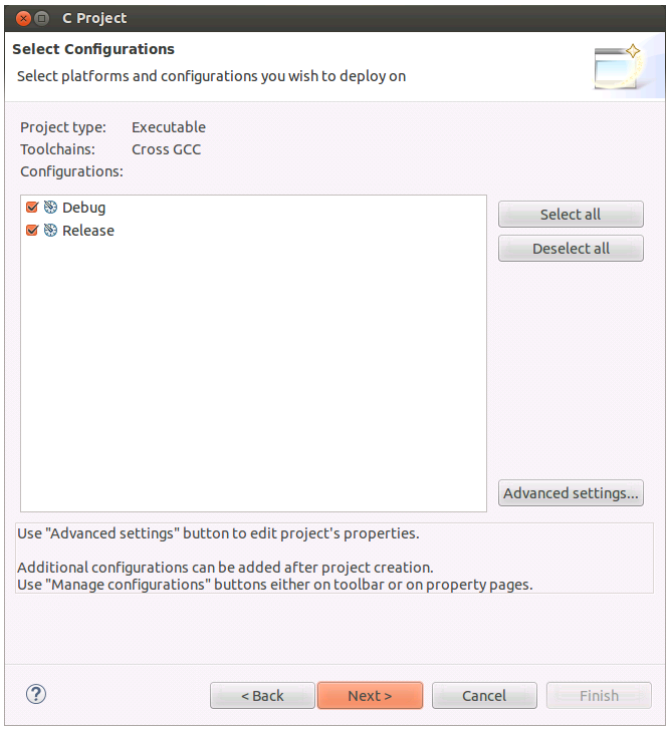
4. Configuring CodeWarrior for ARMv8 for building Linux Kernel

To create a project for building U-Boot inside CodeWarrior for ARMv8, perform these steps:

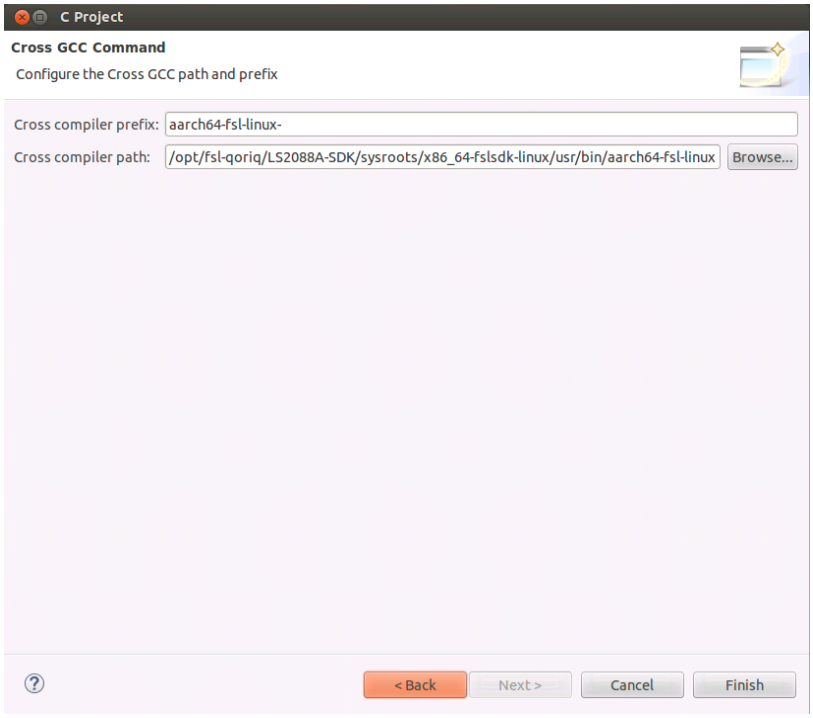
1. Choose **File > New > C Project**
2. Specify the project name and select Empty Project as Project type
3. Uncheck the **Use default location** and use the Browse button to find the location for Linux Kernel source
4. Chose Cross GCC as Toolchain
5. Click Next



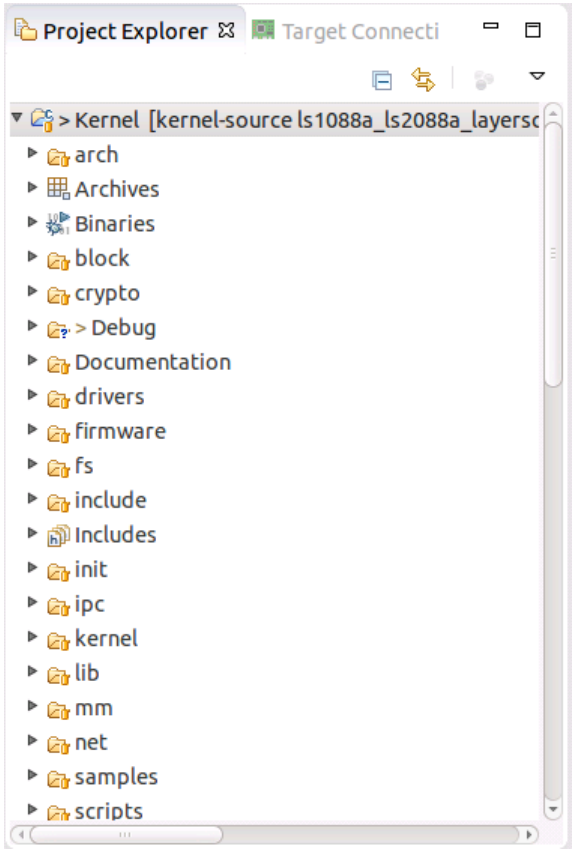
6. Choose both Debug and Release configurations and click Next



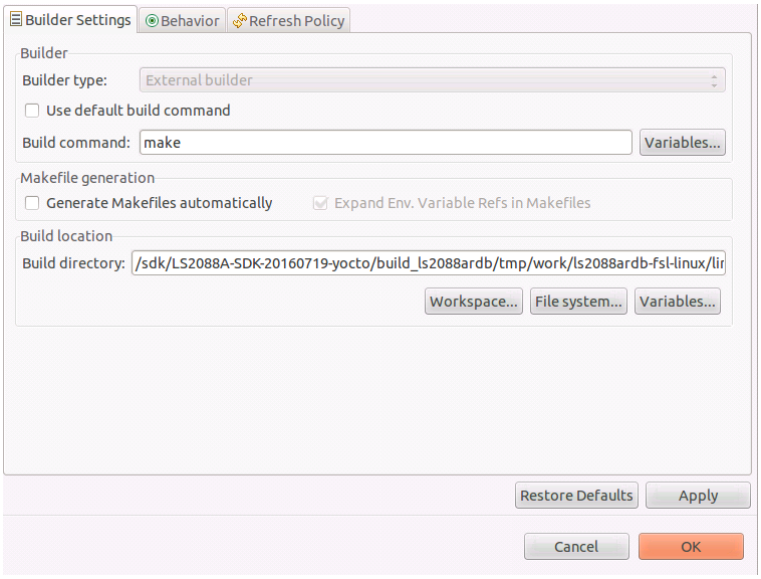
7. Specify the Cross compiler prefix, Cross compiler path and click Finish



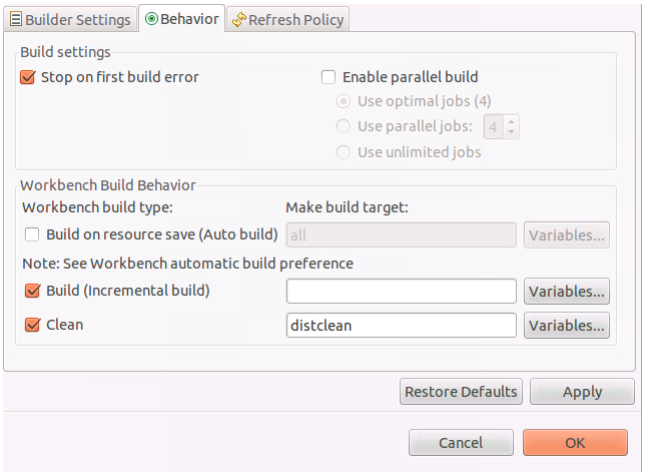
8. Project is created and will appears in Project Explorer view



9. Go to **Project > Properties > C/C++** build, select **Builder settings** and uncheck **Generate Makefiles automatically**



10. Update the **Build directory** with Linux Kernel source code path
11. Select **Behavior**, empty the **Build (incremental build)** field and change clean to distclean in **Clean** field



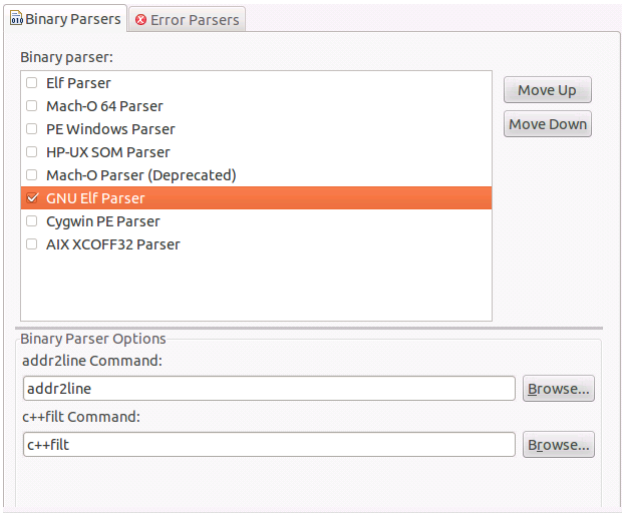
12. Go to **Project > Properties > C/C++ build > Environment** and add environmental variables for:

    Name: **CROSS_COMPILE**
    Value: **aarch64-fsl-linux-**
    Click **Add to all configuration**

Name: **ARCH**
Value: **arm64**
Click **Add to all configuration**

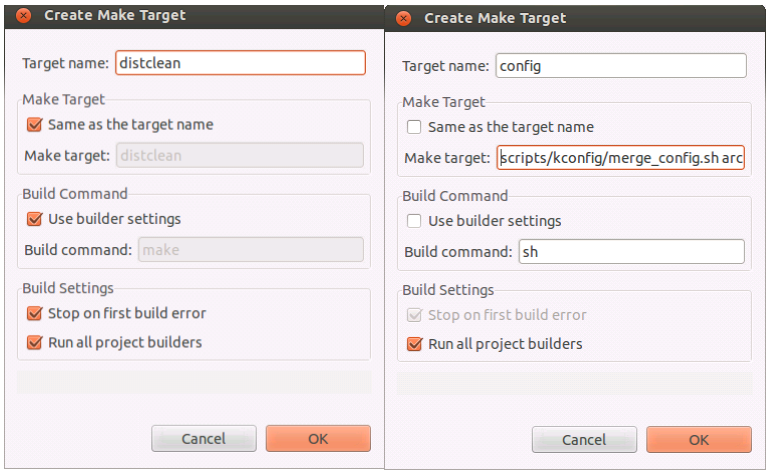
Name: **PATH**
Value: **/opt/fsl-qoriq/LS2088A-SDK/sysroots/x86_64-fslsdk-linux/usr/bin:/opt/fsl-qoriq/LS2088A-SDK/sysroots/x86_64-fslsdk-linux/usr/bin/aarch64-fsl-linux:/usr/sbin:/usr/bin:/bin**
Click **Add to all configuration**

13. Go to **Project > Properties > C/C++ build > Settings** and uncheck **Elf Parser** and check on **GNU Elf Parser**

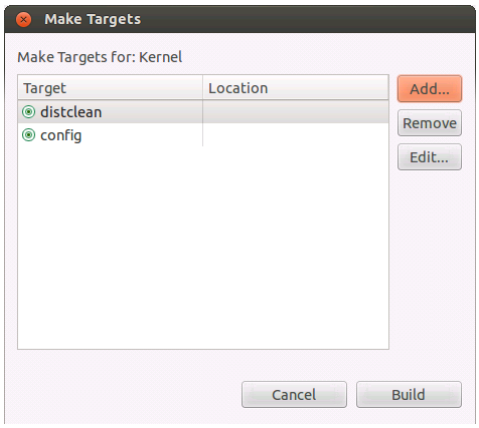


5. Building Linux Kernel using CodeWarrior for ARMv8

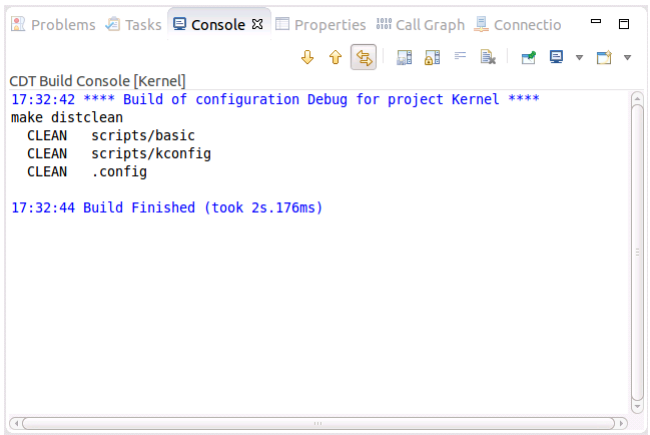
In order to build Linux Kernel using CodeWarrior for ARMv8, two build activities must be created under **Project > Make Target > Build** from the menu bar.



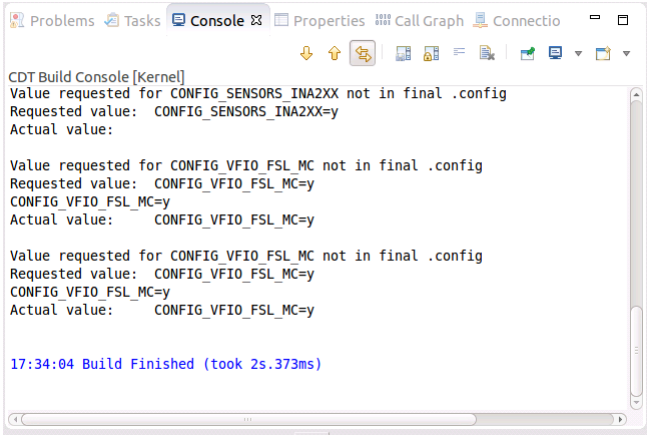
Once configured we have two build targets.



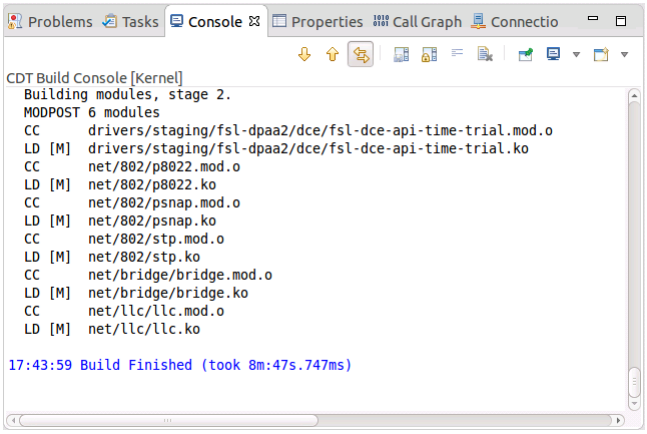
Go to **Project > Make Target > Build**, select **distclean** and click **Build**. A "`make distclean`" command will run removing all the object and temporary files. Below message will be displayed when build is complete in **Console** view.



Go again to **Project > Make Target > Build**, select **config** and click **Build**. A ”`sh scripts/kconfig/merge_config.sh arch/arm64/configs/defconfig arch/arm64/configs/freescale.config`” command will run and configure the Linux Kernel to be built for LS2088ARDB board in this case.



To build Linux Kernel, go to **Project > Build Project** from the menu bar. Below message will be displayed when build is complete in **Console** view.



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