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QorIQ Multicore Processor Development

Processor Expert Software: QorIQ Configuration Suite

Streamline board bring-up time

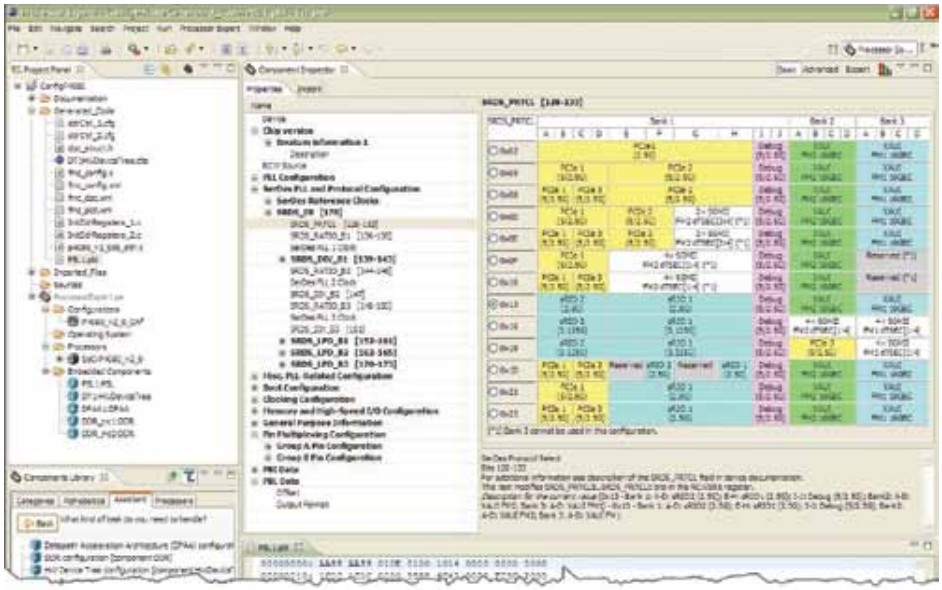
Overview

The QorIQ configuration suite is an Eclipse-based toolset for configuring QorIQ processors to a known working state from silicon reset to avoid the typical board bring up issues that exist in most complex applications with custom hardware designs. This tool suite is implemented as a set of components, each of which knows the details of the silicon control registers, configuration specifics, muxing rules and the necessary value ranges of all the configuration properties. Leveraging Processor Expert software as a framework for these embedded components makes it easy to align tools with new silicon products and support upgraded models. Processor Expert software, and therefore the QorIQ configuration suite, is designed as a set of plug-ins that function within a standard Eclipse environment, such as CodeWarrior Development Studio.

QorIQ Configuration Suite User Interface

Users will create a QorIQ configuration project that defines all imported and generated configuration files (and/or source code) so that a version control system can be used. A simple wizard is used to select basic configuration values and to define default settings. The Component Inspector window is used to modify each property. Each property is automatically evaluated to help ensure that the values are correct and consistent with each other. Each tool has a set of criteria that is applied to help ensure the configuration set is properly defined, including checks with the other tools for consistent configuration of the QorIQ silicon product. Each component generates output in the form necessary for configuration (PBL data in hex format, DDR configuration source code for u-boot, fmc xml data, device tree source files for dts, and so forth). Every tool and property has tool tip style documentation aligned with the product manuals.

The QorIQ configuration suite supports a continually growing number of QorIQ processors. For a current list of devices, visit **freescale.com/QCS**.



freescale™ QorIQ

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The QorIQ configuration suite allows developers to:

- Configure the preboot loader: The preboot loader tool (PBL) supports the bit field settings of the QorIQ reset control word (RCW) and variable length PBI commands for establishing configuration from reset of the SoC. The PBL tool wizard supports either importing an existing configuration or defining a configuration based on preset values as defined in the QorIQ manuals. Import and export can be in various forms, including memory dumps and u-boot files.
- Configure DDR memory: The QorIQ DDR memory controllers are vastly configurable, which leads to a nearly infinite combination of settings possible. Consequently, the DDR configuration tool supports the criteria and conditional testing to help ensure a valid configuration of all settings. Based on internal configuration worksheets, this tool can save days in debug mode. The DDR configuration wizard asks the standard DDR data sheet questions and builds a valid set of configuration settings which can be calibrated for an optimal solution, all while knowing that the tool will show conflicts.
- Create and modify device trees: Hardware, device trees are used by u-boot and our Linux® board support packages to define the device configuration to the Linux drivers. These device trees allow more data-driven support for custom hardware offering ease in configuration and set up. Until now, device trees were edited using XML editors with no knowledge of possible element details and no concept of leaf node references, making for a very time consuming and error-prone process. The QorIQ configuration suite V2.0 or later is designed to include a comprehensive XML editor and graphical representation of the device tree for GUI management and intelligent editing. Trees can be imported and exported from the editor and edited simultaneously in XML and the graphical view.

QorIQ Configuration Suite vs. Device Initialization

Feature	QorIQ Configuration Suite	Device Initialization
Easy-to-use GUI	Yes	Modify data files and C code to function based on reference manual parameters
Built in knowledge base	Yes	Read the QorIQ reference manuals (more than 6,000 pages)
Generated code	Yes	Use the generated code in production software or as a teaching aid and example configuration

- Define data path and DPAA configuration: Netcomm customers think in terms of data flow charts to define IP frame flow from hardware port to software portal, so why not configure the DPAA accelerator in a more convenient method? Currently, developers are asked to edit an XML representation of the data path and compile the XML using the fmc tool to generate API calls or write C source code to configure the accelerator. This configuration tool allows developers to use a data flow charting system to generate the C calls to software drivers for configuring the DPAA. The tool is complimentary to the SDK and NCSW software releases supporting QorIQ processors and adds an easy-to-learn user interface to the incredibly powerful data path accelerator. The QorIQ configuration suite V2.0 or later is designed to include this data path graphing tool for configuring the DPAA from port to portal.
- Redefine configuration for custom hardware, Freescale development systems and evaluation boards provide a good starting point for development. When faced with reconfiguring the system to custom hardware, the QorIQ configuration suite fully supports importing the existing software configuration and allows developers to define the unique characteristics of custom hardware devices, helping to ensure a properly configured solution. The tools support reconfiguration using a visual interface with feedback and instantaneous property checks for completeness/consistency. They are designed to provide the fastest path to configure the software for custom hardware designs and calibrate the solution to function optimally.

Getting Started

The QorIQ configuration suite is supported by Eclipse software V3.5 or later. Install an Eclipse-based tool before installing the QorIQ configuration suite. Current users of CodeWarrior V10.0 or greater or other Eclipse-based tools are ready to install the QorIQ configuration suite. Visit **eclipse.org** to download the Eclipse C/C++ toolset (V3.5 or later) before installing the QorIQ configuration suite.

The QorIQ configuration suite is available via a free moderated download at **freescale.com/QCS**.

For more information, visit freescale.com/QCS

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