Freescale Semiconductor

Release Notes

Document Number:
CW-ARMV8-RN

CodeWarrior for QorIQ LS Series, ARMv8 ISA v11.1.1

Freescale Semiconductor, Inc.

1. Revision History

The following modifications to this release note have been made relative to the note provided with the CodeWarrior for QorIQ LS-Series, ARMv8 ISA v11.1.1 installation:

Date	Description
Aug 6, 2015	Initial revision

Contents

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2. About this release

2.1. Version information

This release note provides important information for users of CodeWarrior Development Studio for ARMv8 ISA. You are encouraged to read this document to become familiar with this release's supported targets, new features, errata with workarounds, and other useful information. The latest revision of this document is available in the Documentation tab of the product support page.

The v11.1.1 milestone delivers enablement tools for the LS1043A device and LS1043A-RDB/QDS boards. Release highlights include:

- LS1043A SoC bare-metal debug and trace, Linux kernel debug with SMP awareness
- Bare-metal support for LS1023A and LS2080/40A personalities
- Board support files for LS1043A-QDS and LS1043A-RDB
- Debugging via the on-board CMSIS-DAP probe (LS1043A-RDB)
- NOR and NAND Flash Programmer support for LS1043A-QDS/RDB
- Linux kernel debugger compatibility with Linux kernel version 4.0
- Reference AMP debug example
- UEFI specific debug extensions (awareness)
- Trace buffer fill monitor
- Trace configuration export wizard
- Simulator support for MMC (LS1043 UEFI SDHC req)
- Simulator compatibility with LS2085A EAR4.0 release
- Building and debugging Linux user space applications compiled for AArch32 execution mode
- Quick Attach and Reset actions added to debugger UI
- Yocto ADT plugins bundled with Linux hosted CodeWarrior
- Application Notes depicting use of the Trace Compass and Yocto ADT integration plugins
- Updated documentation and collaterals

The v11.1.1 release has been verified with:

- Freescale Linux SDK for LS2085A Early Access Release 4
- Development versions of Freescale Linux SDK for LS2085A Early Access Release 5
- Freescale Linux SDK for LS1043A version 0.3

All CodeWarrior components with LS2085A and LS1043A support including CW-ARMv8 are delivered by means of a single installer named CW4NET. Users are advised to install all packages in order to get full visibility and control over the target device (simulated, emulated, or real hardware).

Current version (CW4NET v2015.08) provides options for:

- CodeWarrior for ARMv8 v11.1.1
- CodeWarrior for Advanced Packet Processing v10.1.1
- CodeWarrior Converter Server b433
- Layerscape Device Simulator f0137_150724
- QorIQ Configuration and Validation Suite 4.3
- Scenario Tools version 2.12

- AIOP Analyzer 1.1
- Linaro GCC Linux bare-metal + Linux application (v2014.04, 64-bit)
- Linaro GCC Linux application (v2014.04, 32-bit)

Although included with this distribution of the CW4NET suite, the Advanced Packet Processing component is not applicable to LS1043A.

Packet tracing tools for LS2085A will be published in the future as an optional add-on to the base CodeWarrior product. Availability should be advertised by the in-product advisor, or by invoking the updater manually (Help/Install New Software).

2.2. Licensing

This release is distributed under an End-User License Agreement. The EULA is displayed during product installation and a copy is located in the layout. Please read the contents of the document carefully before using this product.

When used for evaluation purposes CodeWarrior will generate a temporary license valid for 15 days from installation date. Please note that the generated license certificate is node-locked to the machine running the installer; evaluation on multiple machines requires separate installs.

Past expiry, external users can solicit an evaluation extension by opening a licensing SR – please see section 2.4. The license certificate (license.dat) needs to be placed in the CW4NET_<version>/Common/ folder.

Use of the Layerscape Device Simulator in conjunction with CodeWarrior requires a separate license. A guide for obtaining the license is available here.

2.3. Download information

CodeWarrior for ARMv8 v11.1.1 can be downloaded from its product support page on Freescale.com.

2.4. Getting Help

Product documentation is included with the layout, available for off-line from the Documentation folder in the link above, or from **Freescale Infocenter.**

If you have questions, issues, or want to provide feedback, please use the Freescale online support web page. To use this page, follow these steps:

1. In a web browser, go to http://www.freescale.com/TechSupport.
   Freescale's **Technical Support** web page appears.

2. On this page, click the Submit a service request online link.
   The **New Service Request — Category/Topic** page appears.
3. From the Category dropdown menu, select Technical Request.
4. From the Topic dropdown menu, select CodeWarrior (or other appropriate topic).
5. Click **Next**.
   The **New Service Request — SR Details** page appears.
6. In this page, enter the requested information.
   At a minimum, enter information in each field marked by an *.
7. Click **Submit**.
   If you are already logged in, the **Service Request Confirmation** page appears. Go to the last step.
   If you are not already logged in, the **Log-in** page appears.
8. If you are a registered member, login with your user name and password.
   The **Service Request Confirmation** page appears. Go to the last step.
9. If you have not yet registered,
   a. If you want to become registered member, click **Register Now** and complete the registration process.
      The **Service Request Confirmation** page appears.
   b. If you do not want to register, supply your contact information in the **I do not want to register - Provide contact information** form and click **Submit**.
      The **Service Request Confirmation** page appears.
10. Click **Done**.
    Your service request is submitted.

3. System Requirements

CodeWarrior Host

- *Windows® OS*: Intel® Pentium® 4 processor, 2 GHz or faster, Intel® Xeon™, Intel® Core™, AMD Athlon™ 64, AMD Opteron™, or later
- *Linux® OS*: 3 GHz Intel® Pentium® class processor (or better). 64-bit host OS required.
- At least 2 GB of RAM
- At least 3 GB of free disk space.
- Internet connectivity for web downloads and update access.

Layerscape Device Simulator Host

- A 64-bit host running a supported Linux® distribution (see below). 64-bit host OS required.
- Minimum 3 GB, recommended 6 GB of RAM. Memory usage depends on the number of simulated cores and use case being exercised (bare-metal or Linux).

Operating System

Windows			
Host OS	**SP Level**	**32-bit**	**64-bit**
Windows 7	SP1	X	X
Windows 8.1	u1	X	X
Linux			
Host OS	**Version**	**64-bit**	
Ubuntu	12.04	X	
Ubuntu	14.04	X	
Fedora	20	X	
Fedora	21	X	
Debian	7.3	X	
openSUSE	13.1	X	
Mint	17.1	X	
RedHat Enterprise Linux / CentOS	5.4, 5.8	X	
RedHat Enterprise Linux / CentOS	6.5	X	
RedHat Enterprise Linux / CentOS	7.0	X	

NOTES

CodeWarrior installation on 64-bit Linux hosts requires presence of dependent 32-bit libraries in the system. For supported distributions the installer detects missing dependencies and provides options to install them automatically.

For unsupported distributions please follow the instructions provided by the installer and/or installation README. Installation on non-LTS distributions (e.g. Ubuntu 13.x) is not recommended as the package repository changes URL once support for that particular version ends. Please consult the vendor web site for finding out the new repository location and proceed with manual installation of CW dependencies.

It is recommended (although not required) that all product maintenance operations be done with administrative privileges. When running the installer in GUI mode with admin privileges please use the graphical sudo command recommended by your Linux distribution (ie. gksu/gksudo).

CodeWarrior installer may update system drivers for probe connectivity. It is highly recommended that any CW NetApps versions or products should be closed before installing or updating an existing CW. Installation of QCVS component in particular requires any instances of CCS to be closed before attempting the install.

Microsoft Windows XP and Vista hosts are not supported.

4. Release Contents

4.1. Device Support Matrix

The following hardware devices and boards are supported by this release:

Device	Board	GPP cores	AIOP cores	Comments
LS2085A	LS2085A-RDB	8 (A57)	16	Main personality of the LS2 family.
LS2045A	LS2085A-RDB	4 (A57)	16	2 core variant of LS2085A.
LS2080A	LS2085A-RDB	8 (A57)	-	No AIOP variant of LS2085A.
LS2040A	LS2085A-RDB	4 (A57)	-	
LS2085A	LS2085A-QDS	8 (A57)	16	
LS2045A	LS2085A-QDS	4 (A57)	16	
LS2080A	LS2085A-QDS	8 (A57)	-	
LS2040A	LS2085A-QDS	4 (A57)	-	
LS1043A	LS1043A-RDB	4 (A53)	-	
LS1043A	LS1043A-QDS	4 (A53)	-	
LS1023A	LS1043A-RDB	2 (A53)	-	2 core variant of LS1043A.
LS1023A	LS1043A-QDS	2 (A53)	-	

4.2. Documentation

Product documentation is available in several formats:

- Integrated with the help system
- In the product layout in PDF format (CW_ARMv8/ARMv8/Help/PDF/)
- Off-line download from Compass Extranet (see download location above)
- **Freescale Infocenter**

Getting Started Guides

Hardware Board Getting Started Guide
The CodeWarrior for ARMv8 Getting Started guide explains how to install the CodeWarrior Development Studio for ARMv8 software. Additionally, it describes how to use the software to create, build, and debug a demonstration multi-core processor project.

As of the 11.1.1 release the Getting Started Guide has been updated with LS1043A-QDS and LS1043A-RDB information.

Simulator Getting Started Guide
This document explains how to install the CodeWarrior Development Studio for QorIQ LS series - ARM V8 ISA. Additionally, it describes how to use the CodeWarrior software to create, build, and debug a simple project using Simulator.

Service Pack Updater Quick Start
Explains how to install a service pack or an update for your CodeWarrior software running on the Windows or Linux platform.

Application Notes

AN5172: Trace Compass from CodeWarrior for ARMv8

This document describes how to use the Trace Compass from CodeWarrior for ARMv8. Trace Compass is an open source toolkit that integrates open source trace frameworks / toolkits. It is based on a couple of Eclipse plugins (views) and a lot of binaries, shared libraries.

AN5171: Yocto ADT plugins in CW for ARMv8

This document of the Yocto ADT plugins bundled with CW for creating, building, and debugging a Linux application on the LS2085A EAR SDK

AN4940: NADK Reflector Application Debug
This document explains how you can build a real hardware setup for running the reflector. It also explains how to import, download, run, and debug the reflector application from CW, and how you can attach to a running NADK reflector application and debug it using CW.

AN5129: Linux hardware trace for ARMv8 user space and kernel space applications.
This document describes the Linux probe-less trace component and presents multiple execution flows of it. The objective of this component is to encapsulate the trace configurator and probe into one small and cross-compiled component that will be uploaded on target machine. Its main use is to collect trace of a program that crashes without known reasons. This feature will be delivered as an archive or part of the ARMv8 CodeWarrior.

AN5128: Linux Kernel & User Applications Debug Print Application Note
This document describes the Linux Debug Print tool and presents the execution flow. Its main objective is to provide a user friendly way of monitoring kernel and user space applications activities in a CodeWarrior console.

AN4950: Simultaneous Debug using CW for ARMv8/APP
This application note depicts the steps required to debug both the GPP and LDPAA cores simultaneously using CW for ARMv8 and CW for Advanced Packet Processing.

AN5028: Configuring and Decoding Trace without using CodeWarrior
Explains use of command-line trace configuration and decoder utilities.

AN5054: CodeWarrior and Simulator setup for multiple users
Explains product setup and configuration for a single installation shared by multiple users in parallel.

User Guides

CodeWarrior for ARMv8 Targeting Manual
This document is a comprehensive reference of all major CodeWarrior product features, including:
- Creating sample bare-metal/Linux projects through the New Project Wizard
- Build tool configuration panels
- Target connection using the CodeWarrior TAP and CMSIS-DAP debug probes
- CodeWarrior Debugger reference
- U-boot debugging flow
- Linux kernel and Linux module debugging flow
- Linux application debug
- OS Awareness configuration reference
- Flash programmer
- Troubleshooting

Layerscape Simulator User Guide
This manual describes the main features included in the software simulation package. The package consists of the software simulation modules released with CodeWarrior Development Studio for ARMv8 and APP.

CodeWarrior for ARMv8 Tracing and Analysis User Guide
This document explains the purpose and use trace decoders and configurators. As of the v11.0.10 release additional details have been added around Analysis Results, Trace Commander and Trace Viewer.

CodeWarrior TAP Users Guide

Explains how to set up the CodeWarrior TAP debug probe so it can communicate with the debugger and the target hardware.

Cheat Sheets

Use cheat sheets to complete moderate-to-complex tasks by following instructions that you execute real-time within the CodeWarrior IDE. Select **Help > Cheat Sheets** > **QorIQ LS series ARM V8 ISA** in CodeWarrior IDE to run a cheat sheet.

4.3. Simulator

This release includes simulator version f0137_150724, supporting LS2085A, LS1043A and LS1088A models.

New features included:

- Added support of MMC card required by LS1043 UEFI SDHC Driver
- CAAM: Support for the register-based service interface
- Compatibility with LS2085A SDK EAR4.0

A set of the most relevant items is listed below:

ENGR00359512	FDMA ASA and PTA present/replace issues
ENGR00358443	In TOCT counter in the MAC the low and high parts are reversed
ENGR00358518	Performance improvement for accelerators return
ENGR00358348	Mpic Timers don't work
ENGR00356194	AIOP Coverage issue
ENGR00360148	Receive "Stack limit violation" when enqueue FD before AIOP WS is enabled
ENGR00360116	Not supporting 25MHz Generic timer clock source frequency
ENGR00360117	u-boot hangs at Flash init
ENGR00360535	Incorrect number of NOR sectors
ENGR00360534	SVR number is incorrect
ENGR00362166	The address map files (ccsr/soc) are incorrect for LS1088A targets
ENGR00362649	Simulator crushes with a 'segmentation fault'
ENGR00362550	FDMA: L1_03A New Spec Release - Need update in Model
ENGR00362222	FDMA : L1_02A BG support
ENGR00358954	TMAN BG 2.0 Update
ENGR00363098	QBMAN: DQRR_DCAP[DCAP_CI] should be 3 bit width in 1088 but it seems it was left with 2 bit

ENGR00363018	QBMAN: CQ channel id isn't derived correctly from CQID
ENGR00363220	CAAM: Register-based service interface not working on LS1080

As of the 11.1.1 release the simulator using a unified startup procedure. More details regarding this change:

- Debug arguments for run-sim.sh and start_sim_uboot_debug/start_sim_app_debug are now unified.
- The custom script can be given now to run-sim.sh or start_sim* as:
  `-s source='<custom_source_script> with optional arguments'`
  Default LS1043 images are no longer shipped with the simulator drop, and expected to be provided by the SDK. Their location is now a run-sim.sh parameter.

- Dropped the following legacy run-sim.sh flags:
  `-c <cores>` , users should use the tested simconfigs. It can still be overwritten via LS_SIM_A57_CORE_COUNT/LS_SIM_A53_CORE_COUNT
  `-s <true/false>` , use "-sp_enable=<true/false>" instead
  `-d <dpl>, -k <kernel.itb>, -f <mc.itb>, -u <u-boot.bin>, -i <aiop.elf>` , these are SDK-specific, use "-source" instead
  `-h <tio-host>` , use "-tio_host=<hostname>" instead
  `-p <tio-port>` , use "-tio_port=<port>" instead
  `-a, -m` , use "-use_tio_console=<duart1_1,...>" instead
  `-e 'extra arguments for simulator'` , use start_sim_uboot_debug or start_sim_app_debug arguments directly

4.3.1. Block Guide versions

Layerscape Component Documents – LS2085A, LS1088A		
Document Name	**Version Number**	
	LS2085A	LS1088A
AIOP Archdef	1.7	idem
AIOP FDMA	L1_03A	idem
AIOP CDMA	L1_02A	idem
AIOP WRKS	L0_03A	idem
AIOP TMan BG	2.0.1	idem
AIOP OSM	1.0	
AIOP CTLU BG	1.0.0	idem
AIOP MFLU BG	1.0.0	idem
AIOP Core z490 Reference Manual	RM 1.8	idem
AIOP Instruction Extensions	Rev 1.1	idem
WRIOP BG	1.0	idem

QBMan BG	BG 2.47	04.01.00_L0_01A_doc_01
CAAM RM	RevA	idem
Parser BG	Rev 3.103	idem
MCC Archdef	AD 0.7	idem
MC Core z4201n3 Reference Manual	RM v 1.94	idem
SoC Archdef	LS2 Archdef 1.02	LS1080 Archdef 08.0
PME 3.0 BG	BG 0.94	NA
DCE 2.0 BG	BG 0.94	NA
FD Specifications	BG 0.62.3	idem
DDRC BG	BG 5.2	idem
DUART BG	BG 1.2	idem
IFC BG	2.0	2.0
PEX BG	LS1021 RevD RM	idem
USB FSL BG	Map_usb	idem
USB synopsys databook	2.5a	idem
USB XHCI spec	1.1	idem
QDMA BG	BG Rev 0.9 Version 6	idem
Service Processor BG	BG 0.5	idem
Device Configuration	LS2085A RM Rev B	idem
SDHC BG	BG 2.08	idem
Layerscape Component Documents – LS1043A		
Document Name	**Version Number**	
	LS1043A	-
LS1043 SoC Archdef	Chassis Archdef Gen2.1 LS1043 Archdef 0.9.9	
DDRC Block Guide	BG 5.2	
DUART Block Guide	BG 1.2	
QMan Block Guide	From DPAA1 (with updated register map)	
BMan Block Guide	From DPAA1 (with updated register map)	
CAAM Block Guide	BG v1.0	
FMan Block Guide	BG 0.9	
IFC Block Guide	BG 1.3_C	
USB	USB3	
SDHC Block Guide	BG 2.08	

4.3.2. Device Support

The following simulator configuration targets are supported:

Device	GPP cores	MC cores	AIOP cores	Service Processor	Comments
ls2085a	8 (A57)	2	16	Disabled	Default, recommended for SMP Linux.
ls2085a-lite1	2 (A57)	2	4	Enabled	Performance model of the above.
ls2085a-min	1 (A57)	2	4	Disabled	Internal single-core GPP development target
ls1043a	4 (A53)	-	-	-	
ls1088a	8 (A53)	1	4	Disabled	

NOTE Although exposed in the CodeWarrior debugger configuration GUI at the same level as hardware targets, it should be noted that the ls2085a–lite1 variant does not correspond to an actual hardware device. This configuration is intended for use with the simulator only.

4.4. Debugger/IDE

4.4.1. LS2085A QDS/RDB

This release includes support for the LS2085A device on the LS2085A-QDS and LS2085A-RDB boards.

The following table summarizes the feature set and verification status for the entire 11.1 Alpha series concluding with its Final milestone.

Feature	QDS	RDB
Attach/Connect	Tested	Tested
Register access	Tested	Tested
Memory access	Tested	Tested
Reset to debug	Tested	Tested
Reset to user	Tested	Tested
Single core run control (run/step/stop)	Tested	Tested
Software breakpoints	Tested	Tested
Hardware breakpoints	Tested	Tested
Debug in SRAM	Tested	Tested
Board initialization file	Tested	Tested
Download	Tested	Tested
Access with caches turned on	Tested	Tested
Watch points	Tested	Tested
U-boot debug scenario	Tested	Tested
RCW override	Tested	Tested
Project stationary	Tested	Tested
UART I/O	Tested	Tested
Multicore run control (run/step/stop)	Tested	Tested
Semihosting I/O	Tested	Tested
Debug u-boot in ROM	Tested	Tested
Flash Programmer - NOR	Tested	Tested
Flash Programmer - NAND	Tested	Tested
Linux Kernel Debug	Tested	Tested
Linux Application Debug	Tested	Tested

NOTE All JTAG based features (bare-metal, Linux kernel/module debug) assume an AArch64 execution mode.

4.4.2. LS1043A-RDB/QDS

Feature	QDS	RDB
Attach/Connect	Tested	Tested
Register access	Tested	Tested
Memory access	Tested	Tested
Reset to debug	Tested	Tested
Reset to user	Tested	Tested
Single core run control (run/step/stop)	Tested	Tested
Software breakpoints	Tested	Tested
Hardware breakpoints	Tested	Tested
Debug in SRAM	Tested	Tested
Board initialization file	Tested	Tested
Download	Tested	Tested
Access with caches turned on	Tested	Tested
Watch points	Tested	Tested
U-boot debug scenario	Tested	Tested
RCW override	N/A	N/A
Project stationary	Tested	Tested
UART I/O	Tested	Tested
Multicore run control (run/step/stop)	Tested	Tested
Semihosting I/O	Tested	Tested
Debug u-boot in ROM	Tested	Tested
Flash Programmer - NOR	Tested	Tested
Linux Kernel Debug	Tested	Tested
Linux Application Debug	Tested	Tested

4.4.3. DAP Mode Required

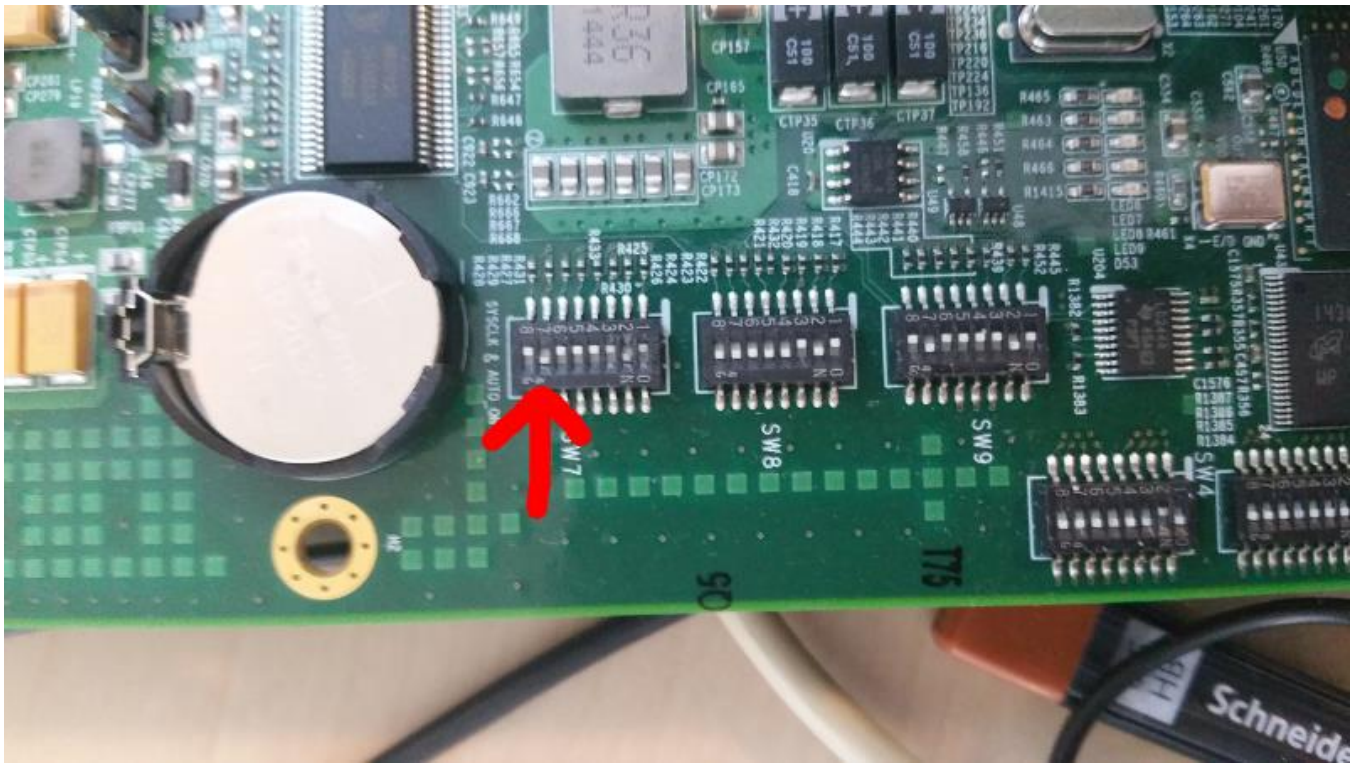
Starting with the 11.1 release the tools assume the target board is configured for ARM debugger compliant mode, as opposed to Boundary Scan mode.

The following switches need to be applied:

- LS2085A-RDB: SW7.7 set to ON (TBSCAN_EN_B=1)
- LS2085A-QDS: SW5.7 set to ON (TBSCAN_EN_B=1)

Failure to apply the correct switch configuration results in inability to connect to the target. Connectivity in Boundary Scan mode is no longer supported.

The following picture shows the location of the switch on the LS2085A-RDB:



4.4.4. New Debugger Features

The following features have been introduced or refined in the 11.1 release series:

- Eclipse 4.4.2 / CDT 8.6, and inclusion of the Mylyn framework.
- IDE support for license management (Help > Freescale Licenses)
- Eclipse support for OS Resources.
- ASM/C stationery projects updated to support both SMP/AMP applications. Use the dedicated switch in the start.S file.
- Cache is now enabled by default in stationery projects.
- New ELF importer wizard - CodeWarrior Debug Projects – assisting with generation of launch configurations suitable for bare-board, Linux application, kernel and u-boot scenarios. Relevant awareness settings (ie. Linux or u-boot) are automatically set.
- U-boot awareness for simulator/hardware targets. Similar to Linux Kernel awareness, the debugger is now able to detect changes in the MMU configuration done by u-boot and adjust symbolic display accordingly. The feature can be activated from the OS Awareness tab.
- Debugging a SMP session will target the secondary cores only after Linux kernel resumes them from hold-off.
- Interrupts are now inhibited during single-stepping operations.
- The GDB Hardware Launcher now displays an error if an old GDB version is detected. CodeWarrior requires gdb versions greater than 7.4.
- Default connection timeout reduced to 10 seconds in order to avoid apparent hangs with a slow/unresponsive target.
- Automatic choice of debugger server port if no user port selection exists.
- CodeWarrior will display a detailed warning dialog when "Verify memory after Download" fails. The warning dialog will list the elf section, the download address and verification status.
- Flash Programmer, enable unprotect command for all supported devices.
- Simple single-stage MMU configuration dump implemented as a GDB/Python extension. To use please type the following commands in the GDB console:

```
source -s mmu/scripts/mmu_init.py
mmu
```

- "Attach" action from Target Connections view was moved to the view's toolbar and renamed to "Inspect". Similarly, a new action was added for the connect flow which resets the target and runs the initialization file.
- "Use target init" option from Target Connection Configurator page was renamed as "Execute target initialization file" and moved in Debugger tab from launch configuration.
- Support for Linux kernel, module and application debug on the LS1043A-RDB board.
- Support for Linux kernel, module and application debug on the LS1043A-QDS board.
- Support for bare-metal debug for the LS1023A rev. 1 QDS and RDB.
- Support for debugging Linux application executables and shared libraries compiled for AArch32 mode.
- Added support for the case when the Linux kernel is compiled for AArch64 and user space runs in AArch32.
- Added new entry in ARMv8 New Project Wizard targeting AArch32 Linux application projects.
- Debugger support for LS2080/40A with LS2085A-RDB board.
- New Reset action was added in the Debug view. This option resets the board and, depending on the user choice, may run the target initialization file.
- Added support for CMSIS-DAP probe.
- Discontinued support for Windows XP and Windows Vista.
- Added new option in Launch Configuration, Debugger tab: "Synchronize with breakpoints set in GDB console". This option toggles synchronization of breakpoints set in GDB console with the CodeWarrior UI.
- Added a new Flash Programmer command, fl_info, to obtain info (in a human readable format) about a flash device.
- File "exceptions.c" was added in the New Project Wizard projects to incorporate exception handlers for C development purposes.
- Linux support for kernel version 4.0.

- Added new "UEFI" type in OS Awareness type with the option to use the CodeWarrior defined UEFI initialization script or to use a custom script. When the UEFI Awareness is enabled, the command uefi-add-symbols (used to add symbol files for all UEFI modules loaded in memory) is enabled.

- Target Connection view automatically makes the last edited board configuration the default.

- The details area in Target Connections view now shows the connection information of the selected configuration.

- Linux support for LS1023 rev.1, QDS and RDB boards.

- Flash Programmer commands can now be invoked directly from the GDB console.

Notes:

- If the TCP connection between ARM1 (virtual NIC on the Linux Host PC) and eth0 (embedded Linux) is slow when the ping command is executed (e.g. the time is more than 200 ms) the user need to increase the timeout limit in GDB to wait for the remote target to respond. To do that, add the command 'set remotetimeout 10' in .gdbinit script to set the timeout limit at 10 seconds (the default value is 2 seconds).

- CodeWarrior will do source level debugging using symlink destination file path instead of original source path. For this, create a source path substitution gdb command to point to a non-existing path. Place gdb command in "Startup" sequence from "Debug Configurations". The command syntax is: set substitute-path <from> <to>. Alternatively, create a gdb init file located near the debugged file with '-gdb.gdb' extension, e.g. 'apploader.elf-gdb.gdb' with the gdb command substitution.

- In some cases user cannot download and debug the linux application project. This has been observed when connection between host PC and target board has very small delay, e.g. a cross-connect cable.

  As a suggested workaround set the “ttywait” value to 1 in the Remote System properties, Connector Service page, “SSH Settings” group.

- The ARM core can enter in a non-recoverable state when a speculative access to an unmapped memory happens. Also this can happen for accesses to memory regions that are marked as valid in the MMU, but the underlying memory interface is either misconfigured or absent. For example, access to a memory range dedicated to PCIe without a proper initialization for the PCIe controller or access to memory holes as defined in the SoC memory map can cause core to enter in a non-recoverable state.

  If the debugger detects a failed attempt to stop the core in such situation, it samples the value of the External PC Debug register (EDPCSR) in order to provide the program location where the program

has hanged. An error message is displayed informing the user that the stop attempt has failed and listing the collected PC sample value.

Although the debug session is not reliable from this point onwards and must be terminated, the PC value allows the user to identify and fix the application problem that has caused the core to enter into the non-recoverable state. The user needs to make sure that the MMU is configured from the application in such a way that all valid translations point to the actual memory.

4.5. Software Analysis

The following features have been introduced or refined in the 11.1.1 release series:

- Linux kernel and application trace support - code coverage and profiling statistics generated based on hardware trace.
- Linux Debug Print functionality - provides a user friendly way of monitoring kernel and user space applications activity in a CodeWarrior console.
- Overwrite mode support – continuous trace collection using wrap mode in a dedicated buffer, useful for crash analysis.
- Trace decoding and display for the following trace sources:
  - ETM
  - STM
  - PXDI
  - DDDI
  - NoC
- New views for bareboard profiling:
  - Timeline - shows the evolution of the execution in time.
  - Code coverage – presents code coverage data into two views; the top view displays the summary of the functions, and the bottom view displays the statistics for all the instructions executed in a particular function.
  - Performance displays the count and invocation information for each function that executes during the measurement, enabling you to compare the relative data for various portions of your target program.
  - Call tree - shows the biggest depth for stack utilization in Call Tree and the functions on this call path are displayed in green color.
- Executable relocation support for trace decoding.
- Automatically save results – trace results are saved before starting a new trace session.
- Trace buffer fill monitor is now available in Trace Commander view during a trace session.
- Export wizard for all ARMv8 trace configurations.

- Known issues:
  - For LS1043A/23 only kernel trace collection is available due to some hardware limitations.

- DCSR access is disabled by default. To enable linux trace run the following command in uboot console: “mw.l 0x15100F0 0xFF003300 1”

4.6. QorIQ Configuration and Validation Suite

The NetApps installer now provides the option to integrate the QorIQ Configuration and Validation Suite with LS2085A support with the base CodeWarrior for ARMv8 layout. QCVS is a collection of graphical tools assisting with configuration of various software or hardware modules, generation and validation of configuration data provided in a variety of formats.

The current release (QCVS 4.3 nightly 150714) includes:

- DDR Validation, PBL and Hardware Device Tree support for the LS2085A target. DAP access only mode is supported.
- DDR4 support
- SerDes Configuration and Validation tool

4.7. Scenario Tools

This release incorporates Scenario Tools version 2.12. Scenarios Tool is an advanced performance measurement tool that configures, collects and analyzes platform counters and presents them in a graphical fashion.

New features and capabilities in this release.

- Full support for LS2085A
- Preliminary support for LS2040A/LS2080A.
- Support for LS1043A (core only)
- Updated User Manual and On-Line help.

The following general improvements have been made in the final Scenario Tools build comparing with its previous version:

- Improved performance when connected to a networked/remote license server.

5. Known Issues

The following defects are known to be present in this release.

Defect ID	Component	Issue
DBG-925	Debugger	Issue: [GDB Command Line] In some cases, a "command aborted" error triggers creating a huge number of gdb processes Workaround: none
DBG-922	Debugger	Issue: [u-boot debug] [RDB only]: Cannot suspend target after continue target from entry point Workaround: none
DBG-567	Debugger	Issue: Pinning GDB Console doesn't persist between two different debug sessions. Workaround: to quickly switch to the correct GDB console, select GDB element from Debug view.
DBG-333	Debugger	Issue: On slow machine, "Terminate and debug" on simulator target might seldom fail. Workarounds: - Start simulator with -noRestart option (./start_sim_bare_metal -noRestart) - Wait few seconds between terminating and starting again a debug session to allow simulator to restart
DBG-1142	Debugger	Cannot step/resume when having Hardware Breakpoints over the limit supported by target. Solution is to limit number of HW breakpoints used.
DBG-951	Debugger	[Attach reflector] Set breakpoint at main function is not mapped with source file Workarounds: - either start the application and the gdbserver separately, and use 'C/C++ Attach to Application" to attach to the running application - or use "C/C++ Remote Application" in order to start the application from gdbserver and debug it from the entry point
DBG-1310	Debugger	No support for NAND flash via CMSIS_DAP.

ENGR00361695	CCS	Issue: SW breakpoints don't get hit across ELs with different MMU/Cache settings Workaround: none
ENGR00360238	CCS	Issue: RCW override does not work on LS1043A Workaround: none
ENGR00354406	Software Analysis	Issue: Core not in debug error is showed when STM trace is generated Workaround: Core becomes unresponsive when STM trace is generated using guaranteed transactions on LS2085A. Not reproducible if wrap buffer mode is used or if instead of guaranteed transactions we used Invariant Timing transactions.
ENGR00363059	Simulator	Issue: The simulation is stuck for LS1043A when trying to ping between host and simulator. Workaround: none (there is no official LS1043A SDK simulator release which included the Ethernet port support).
ENGR00362837	Simulator	Issue: -auto_nic=fsl/smsc option does not work with ls2-sdk-ear4.0 pack Workaround: use LS2085A SDK phase 4.0 for application debug
	QCVS	See the QCVS Release Notes document, section 7.
	Software Analysis	See the Software Analysis RN, section 9.

How to Reach Us:

Home Page:
www.freescale.com

E-mail:
support@freescale.com

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