

# CodeWarrior for QorIQ LS Series, ARMv8 ISA v11.4.0

NXP Semiconductors

## 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 v11.4 installation:

Date	Description
Jan 31, 2019	V11.4.0

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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 ARMv8 v11.4.x series designates the set of releases based on the 2018 eclipse.org release (Oxygen). The 11.4.0 release focuses on platform introduction and layout changes and delivers a small set of incremental improvements over 11.3.x series. Subsequent releases will resume the regular cadence of NPI/maintenance/new feature introductions.

#### New in ARMv8 v11.4.0 (v2019.01)

- Installer
  - Stand-alone installer: CW-APP and CW-ARMv7 no longer bundled with CW4NET. Stand-alone installer for CW-APP will be separately provided.
  - Simulator removed from CW4NET. External users should contact support to get access to the component.
- New devices and boards
  - LS1028A device support
  - LS1017A, LS1027A, LS1018A personality support in debugger
  - LS1028A-RDB and LS1028A-QDS reference design BSPs
- ARMv8 Debugger
  - Synchronization with LSDK 1812
- QorIQ Configuration and Validation Suite 4.16
  - PBL and DDR Configuration/Validation for LS1028A
  - DD3L support for LS1028A
- Host OS:
  - Update for Win10 v1803 and Ubuntu 18.04 LTS

### 2.2 Licensing

This release is distributed under an End-User License Agreement. The EULA is displayed during product installation; a copy is also 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.

## 2.3 Download information

CodeWarrior for Networked Applications v2019.01 can be downloaded from the Software & Licensing section of the NXP.com account. Product updates are delivered online and installed as follows:

- Help > Install New Software
- Choose “ARMv8 Eclipse Update Site”
- Select all components
- Proceed with the installation.

## 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 [NXP Infocenter](#).

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

1. In a web browser, go to <https://www.nxp.com/support/support:SUPPORTHOME> .  
NXP **Technical Support** web page appears.
2. For general purpose questions/support please follow the Technical Communities link. Note this is a public, moderated forum.
3. For specific questions please follow the Support Requests link and instructions listed in the Web wizard.

### 3. System Requirements

#### Operating System

Windows			
Host OS	SP Level	32-bit	64-bit
Windows 10	1803		X
Windows 7	SP1	X	X
Linux			
Host OS	Version	64-bit	
Ubuntu	18.04, 16.04	X	
Fedora	21	X	
Mint	17.x, 18.x	X	
RedHat Enterprise Linux / CentOS	6.x, 7.0	X	

- *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 (minimum 5 GB / recommended 8 GB if using the Layerscape device simulator)
- At least 6 GB of free disk space.
- Internet connectivity for web downloads and update access.

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**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.

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## 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
<b>LA1575</b> (rev. 1)	LA1575-RDB	4 (A53)	4
<b>LS1012A</b> (rev. 1)	LS1012A-RDB LS1012A-QDS LS1012A-FRDM	1 (A53)	-
<b>LS1012A</b> (rev. 2)	LS1012A-FRWY	1 (A53)	-
<b>LS1023A</b> (rev. 1, rev. 1.1)	LS1043A-RDB LS1043A-QDS	2 (A53)	-
<b>LS1043A</b> (rev. 1, rev. 1.1)	LS1043A-RDB LS1043A-QDS	4 (A53)	-
<b>LS1026A</b> (rev. 1)	LS1046A-RDB LS1046A-QDS	2 (A72)	-
<b>LS1046A</b> (rev. 1)	LS1046A-RDB LS1046A-QDS	4 (A72)	-
<b>LS1044A</b> (rev. 1, rev. 1.1)	LS1088A-RDB LS1088A-QDS	4 (A53)	-
<b>LS1048A</b> (rev. 1, rev. 1.1)	LS1088A-RDB LS1088A-QDS	4 (A53)	4
<b>LS1084A</b> (rev. 1, rev. 1.1)	LS1088A-RDB LS1088A-QDS	8 (A53)	-
<b>LS1088A</b> (rev. 1, rev. 1.1)	LS1088A-RDB LS1088A-QDS	8 (A53)	4
<b>LS2044A</b> (rev. 1, rev. 1.1, rev. 1.1.1)	LS2088A-RDB (rev. D, rev. F) LS2088A-QDS	4 (A72)	-
<b>LS2048A</b> (rev. 1, rev. 1.1, rev. 1.1.1)	LS2088A-RDB (rev. D, rev. F) LS2088A-QDS	4 (A72)	16
<b>LS2084A</b> (rev. 1, rev. 1.1, rev. 1.1.1)	LS2088A-RDB (rev. D, rev. F) LS2088A-QDS	8 (A72)	-
<b>LS2088A</b> (rev. 1, rev. 1.1, rev. 1.1.1)	LS2088A-RDB (rev. D, rev. F) LS2088A-QDS	8 (A72)	16
<b>LX2160A</b> (rev. 1)	LX2160A-RDB LX2160A-QDS	16(A72)	-

<b>LS1028A, LS1027A</b> (rev. 1)	LS1028A-RDB LS1028A-QDS	2 (A72)	-
<b>LS1018A, LS1017A</b> (rev. 1)	LS1028A-RDB LS1028A-QDS	1 (A72)	-

## 4.2 Flash Device Support Matrix

The following flash devices are supported by the 11.4.0 release. Please note that not all combinations between devices and flash models are supported out of the box.

Device	Company	Type
JWA57	Micron	eMMC
EMMC_MTFC16_LSCH2	Micron	eMMC
MMCP1xxx_LSCH2	-	eMMC
MMCP1xxx_LSCH3	-	eMMC
MMCP1xxx_LSCH3_v2	-	eMMC
MMCP1xxx_LSCH3_v3	-	eMMC
MT29F4G08ABBDA	Micron	NAND
MT29F4G08ABBEA	Micron	NAND
MT29F16G08ABABA	Micron	NAND
S29GL01GP	Spansion	NOR
S29GL01GS	Spansion	NOR
MT28EW01G	Micron	NOR
JS28F00AM29EWHA	Micron	NOR
S29GL01GN	Spansion	NOR
S29GL032P	Spansion	NOR
N25Q512A	GigaDevice	QSPI NAND
GD5F1GQ4	GigaDevice	QSPI NAND
GD5F2GQ4	GigaDevice	QSPI NAND
MT29F1G01ABBFDSF	Micron	QSPI NAND
MX25UM51245G	Macronix	QSPI NAND
W25N01GW	Winbond	QSPI NAND
N25Q128A	Micron	QSPI NOR
S25FL128S	Spansion	QSPI NOR
S25FS256S	Spansion	QSPI NOR
S25FS512S	Spansion	QSPI NOR
W25Q64F	Winbond	QSPI NOR
MT25QU128ABA	Micron	QSPI NOR
MT25QU512ABA	Micron	QSPI NOR
MT35XU512ABA	Micron	QSPI NOR
MX66U51235F	Macronix	QSPI NOR



W25Q16	Winbond	QSPI NOR
W25Q16DW	Winbond	QSPI NOR
W25Q16FW	Winbond	QSPI NOR
W25Q32	Winbond	QSPI NOR
W25Q80	Winbond	QSPI NOR
SP016GBSDHAU1V10	Silicon Power	SD
SDSP16GB_i.MX6	SanDisk	SD
SDSP16GB_LSCH2	SanDisk	SD
SDSP16GB_LSCH3	SanDisk	SD
SDSP16GB_LSCH3_v2	SanDisk	SD
SDSP16GB_LSCH3_v3	SanDisk	SD
SST25WF040B (blind)	Microchip	QSPI NOR
EN25S64 (blind)	EON	QSPI NOR
MT25QU01GBBB (blind)	Micron	QSPI NOR

Product documentation is available in several formats:

- Integrated with the help system
- In the product layout in PDF format (CW\_ARMv8/ARMv8/Help/PDF/)
- CW4NET documentation page on [nxp.com](http://nxp.com)
- [NXP 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.

### *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.

### *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
- UEFI debug
- OS Awareness configuration reference
- Flash programmer
- Troubleshooting

*CodeWarrior for ARMv8 Tracing and Analysis User Guide*

This document explains the purpose and use trace decoders and configurators. As of the v11.2 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 > CodeWarrior for ARM V8 ISA** in CodeWarrior IDE to run a cheat sheet.

## 4.3 Debugger/IDE

### 4.3.1 Board Support

This release includes board configuration and initialization files for:

- LA1575 device on the LA1575-RDB board
- LS1012A device on LS1012A-QDS, LS1012A-RDB and LS1012A-FRDM and LS1012A-FRWY boards
- LS1043A device on LS1043A-QDS and LS1043A-RDB boards
- LS1046A device on LS1046A-QDS and LS1046A-RDB boards
- LS1088A device on LS1088A-QDS and LS1088A-RDB boards
- LS2088A device on the LS2088A-QDS and LS2088A-RDB boards
- LX2160A device on the LX2160A-QDS and LX2160A-RDB boards
- LS1028A device on the LS1028A-QDS and LS1028A-RDB boards

### 4.3.2 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. Please refer to the board documentation and/or the README associated with the project stationery for the relevant switch configuration. Failure to configure the board properly results in inability to connect to the target.

The following switches need to be applied:

- LS1088A-QDS: SW5.8 set to ON (TBSCAN\_EN\_B=1)
- LS1088A-RDB: SW4.8 set to ON (TBSCAN\_EN\_B=1)

### 4.3.3 New Debugger Features

The following features have been introduced in the 11.4.0 release series:

- Linux kernel version 4.9/4.14 recognized / LSDK 18.12 compatibility
- TFA-aware (only) Linux kernel debug

The following features have been introduced in the 11.3.x release series:

- Based on CDT 9.3
- Linux kernel version 4.4/4.9 recognized / LSDK 18.03 compatibility
- PPA-aware Linux kernel debug
- GIC registers for LS1046A
- JTAG Connection Diagnostics from gdb command line

The following features have been introduced in the 11.2.x release series:

- Based on CDT 8.8.1
- Linux kernel version 4.1 recognized / QorIQ SDK 2.0 compatibility
- LA1575 and LA1575-RDB board support
- LS1012A-RDB, LS1012A-QDS and LS1012A-FRDM board support
- LS2088A-RDB and LS2088A-QDS board support
- LS1046A-RDB and LS1046A-QDS board support
- LS1088A-RDB and LS1088A-QDS board support
- CMSIS-DAP connectivity for LS1012A-RDB, LS1012A-FRDM and LS1046A-RDB
- NPW allows display between little/big type of projects only if a matching toolchain is installed
- User-added toolchain support
- Tooltips for Inspect/Connect buttons
- UART library updated to account for different clock divisors (SVR based)
- Launch time slightly improved / CCS kept resident across sessions
- Memory translations displayed properly for AArch64/BE
- Flash Programmer support for LS2088A NOR, NAND and QSPI  
(All supported devices listed in ... \CW\_ARMv8\Config\flash\flash\_devices.html)
- Flash Programmer automatically connects to the target if no session exists
- Erase option enabled for Flash Program actions
- Support for side-by-side flash devices
- Dedicated icon for in-progress flash programmer actions
- Flash Programmer command-line operations now respond to ^C

- Connection error messages include a link to connection diagnostics
- OS Resources now displays which modules have loaded symbolics

The following features have been introduced in the 11.2 release:

- Support for Flash Programmer GUI. It offers details of flash devices, validation, commands can be added in a flash sequence, execute/import/export flash sequences.
- Support for multicore debugging on aarch64 big endian targets.
- Provided UART and Syscall libraries for big endian bare-metal targets.
- Added support to create stationery projects targeting aarch64 big endian.
- Linux application support to debug executables and shared libraries compiled for aarch64 big endian mode.
- Linux KA support for Big Endian targets.
- Added support to perform debug on LS1012A Interposer board with LS1043 processor.
- Added support for I2C transactions from different devices.
- New "JTAG Connection Diagnostics" option visible from Target Connections view. It launches a series of connection tests and provides hints in case such a test fails.
- Added commands for callback registration for Linux/u-boot awareness events like u-boot relocation, Linux MMU initialization, Linux Kernel module init/removal.
- Support to inform user if a UEFI boot session is not in progress.
- [Linux] Wizard support to generate a kernel project matching the corresponding Linux SDK (the one configured via ADT).
- Debug support for LS2088A emulation target.

The following features have been introduced or refined in the 11.2 Beta 1 release:

- Flash Programmer support for LS1012 Emulator (Palladium) QSPI.
- Support for Flash Programmer protect operations.
- “CodeWarrior ELF Importer” has been renamed to “CodeWarrior Executables Importer”.

- Support for UEFI awareness in "CodeWarrior Executable Importer" wizard.
- Debug support for all the phases from an UEFI boot flow.
- UEFI Awareness support for LS2085A RDB.
- UEFI Awareness support for LS2080A RDB.
- Support for LS1047A Simulator (core registers currently supported).
- Support to automatically load symbols for firmware UEFI files.
- Support to view in the OS Resources view details about UEFI modules.
- Debug support for LS2088A emulation target.
- Export a target configuration now displays a file system browser instead of a workspace browser.
- Support for Save As operation in Target Connection editor.
- Re-designed Duplicate action in Target Connection view, now it just asks for the name of the new configuration.
- Transitioned to Eclipse Mars (4.5) and CDT 8.8: <https://wiki.eclipse.org/CDT/User/NewIn88>.
- ROM target skeleton has been created for C bare-metal stationery as a separate build configuration (ROM). Memory address parameters need to be updated manually for each specific SoC/board from the separate linker configuration file. For details please see the 'ROM target' section in the readme file, corresponding to each Target Connection Configuration (TCC).
- Support for Flash Programmer blank check operation.
- Supported flash models are documented in <layout>\CW\_ARMv8\Config\flash\flash\_devices.html.
- Support to annotate CCS log with register names.

The following features have been introduced or refined in the 11.2 Alpha 1 release:

- Linux support for LS1023 rev.1, QDS and RDB boards.
- Flash Programmer commands can now be invoked directly from the GDB console.

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- The C/C++ Development Toolkit has been updated to version 8.7 and Eclipse 4.5. New and noteworthy in the community page:  
<https://wiki.eclipse.org/CDT/User/NewIn87>  
<https://www.eclipse.org/eclipse/news/4.5>
- Added support for selecting USB devices (cmsis-dap, cwtap/usb) based on serial number.
- Changed default cable type in the Predefined Target Connection Configurations, for hardware targets is USB TAP, for emulation targets is CodeWarrior TAP.
- Fixed typo in New Project Wizard, "Stationery" instead of "Stationary".
- Added debug support for LS1088A emulator (ZeBu) target.
- Added support to flash the NOR device for LS1088A emulator (ZeBu) target.
- Added debug support for LS2088A Emulation target.
- Added debug support for LS2088A Simulator target.
- The board readme file, included in the stationery project, is now accessible directly from the Predefined Target Connection Configuration as a separate tab.
- The Target Connection Configuration can now be opened as a multipage editor.
- Added support to edit board GDB initialization file in editor area and use all editor facilities for easier navigation.
- Two or more Target Connection Configurations can have the same name (each can be exported to any location within the workspace).
- Changed icon for "Reset Board" action in Eclipse toolbar.
- After viewing or changing a Target Connection Configuration it automatically becomes the active one.
- User defined Target Connection Configurations are now backward compatible between workspaces/products.
- Added UEFI command, uefi-show-images, to query the list of UEFI modules.
- Updated GDB version to 7.8.



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
```

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- "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.

### 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.



## 4.4 Software Analysis

The following features have been introduced or refined in the 11.4 release series:

- LS1028 target support

The following features have been introduced or refined in the 11.2 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
- Linux and bare-metal Profiling views:
  - 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.
- Known issues:
  - For LS1043A/23 only kernel trace collection is available due to some hardware limitations.

## 4.5 QorIQ Configuration and Validation Suite

The CW4NET installer provides the option to integrate the QorIQ Configuration and Validation Suite with LA1575, LS1012A, LS1043A, LS1046A, LS1088A, LS2088A, LX2160A 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.

QCVS 4.16 release highlights:

- LS1028A support in PBL and DDR Configuration + Validation
- DDR tool: [LS1028A] Add DD3L support

QCVS 4.15 release highlights:

- PBL tool: Significant refactoring in PBL component enabling easier implementation of erratas in the future
- PBL tool: Regenerate PBL for LS1088 based on latest RCW
- DDR tool: LX2 Improve per bit Read Margins results
- DDR tool: DDR4 address parity settings

QCVS 4.14 release highlights:

- LX2160A support (DDR and PBL)
- DDR tool: Add Walking Ones/Zeros tests for LS1012A
- DDR tool: Data driven support for DDR wizard
- DDR tool: DMA test does not accept address range higher than 0x7FFFFFFF
- DDR tool: Bug fixes
- PBL tool: Bug fixes
- PinMux tool: LS1012 - QCVS doesn't make the difference between CPU revisions for PinMux

QCVS 4.13 release highlights:

- DDR tool: Bug fixes
- DDR tool: RCW override GUI support
- DDR tool: DMA test for LS1012
- DDR tool: Allow skipping WRLV start search table
- PBL tool: Bug fixes
- PinMux tool: Bug fixes
- SerDes tool: Bug fixes
- SerDes tool: Support for LS1012

QCVS 4.12 release highlights:

- DDR tool: Data eye display for Read and Write margins for DDR4 working above 1600MT/s.
- DDR tool: Option to select Write leveling searching method
- DDR tool: Message saying which method is selected for WRLV searcher
- DDR tool: DDR clock default values per target provided in wizard

- DDR tool: Any tables from Centering the clock should be disable/enable by user
- DDR tool: Fixes for LS2088 3rd DDR controller

#### QCVS 4.10 release highlights:

- DDRv: Target reset can now be optionally turned off between tests. Drastically improves test execution time.
- DDRv: Tweaks for read margins algorithm
- DDRv: Write leveling values recognition based on skews
- Automatic determination of DDR data rate based on DDR PLL ratio in DDR wizard page
- DDRv: Option to generate random patterns for BIST tests
- SerDes: LS1046/26A support
- PinMux: LS1043A 23x23 die

**NOTE:** Starting with this release, support for the ARM 32-bit LS102xA targets has been relocated in the QCVS 4.9.1 component installable over CW-ARMv7 only. CW-ARMv7 users can update to QCVS 4.9.1 by using the in-product update advisor.

#### **NOTE:**

By default, for some targets address parity is enabled, but if this field is disabled, the related settings are not set. Same case if it is disabled and then is enabled.

#### Case to Disable:

- Set *Address Parity* to *Disabled* in *Control Configuration 2*
- Set *Parity latency* to *Disabled* in *Timing Configuration 7*
- in *SDRAM mode 5 – DDR\_SDRAM\_MODE\_9* set *CA parity Persistent Error* to *Disabled*, *C/A Parity Latency Mode* to *Disabled*, *Force value* should be on *no* (in case of multiple chip selects active, disabled these fields in *MODE\_9/11/13/15*)
- *Register Control Word 15* should be *0* in *Register Control Words*

#### Case to Enable:

##### 1. For UDIMM and DISCRET DRAM

- *Register Control Word 15* should be *0* in *Register Control Words*
- Set *Address Parity* to *Enabled* in *Control Configuration 2*
- for data rate between to 1600 - 2133 MHZ:
  - > Set *Parity latency* to *4* in *Timing Configuration 7*
  - > in *SDRAM mode 5 – DDR\_SDRAM\_MODE\_9* set *CA parity Persistent Error* to *Enabled*, *C/A Parity Latency Mode* to *1*, *Force value* should be on *no* (in case of multiple chip selects active, set these fields in *MODE\_9/11/13/15*)
- for data rate between to 2400-2666 MHZ:
  - > Set *Parity latency* to *5* in *Timing Configuration 7*
  - > in *SDRAM mode 5 – DDR\_SDRAM\_MODE\_9* set *CA parity Persistent Error* to *Enabled*, *C/A Parity Latency Mode* to *2*, *Force value* should be on *no* (in case of multiple chip selects active, set these fields in *MODE\_9/11/13/15*)

- for data rate between to 2933-3200 MHZ:
  - > Set *Parity latency* to 6 in *Timing Configuration 7*
  - > in *SDRAM mode 5 – DDR\_SDRAM\_MODE\_9* set *CA parity Persistent Error* to *Enabled*, *C/A Parity Latency Mode* to 3, *Force value* should be on *no* (in case of multiple chip selects active, set these fields in *MODE\_9/11/13/15*)

2. For RDIMM

- Set *Address Parity* to *Enabled* in *Control Configuration 2*
- Set *Parity latency* to *Disabled* in *Timing Configuration 7*
- Set *Register Control Word 15* to 4 in *Register Control Words*
- Make sure *CA parity Persistent Error* and *C/A Parity Latency Mode* are *Disabled* for *MODE\_9/11/13/15*



## 5. Fixed Issues

Issue Type	Issue key	Summary
Defect	QCS-5766	[LX2] Handle correctly the enablement of DRAM clock while executing various DDR validation scenarios
Defect	QCS-5785	[LS2] BIST with no turnaround will fail when you import configuration from target
Defect	DTINST-722	Cancel button is not enabled after the installation starts

## 6. Known Issues

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

Issue Type	Key	Summary
Defect	DTDBG-4244	LS1028A-QDS unstable at default JTAG speed. <i>Workaround: Use a JTAG speed of 10000kHz for LS1028AQDS.</i>
Defect	DTDBG-4252	Connection diagnostics doesn't work on cmsisdap from UI. <i>Workaround:</i> 1. Edit <CodeWarrior Folder>CW_ARMv8\ARMv8\gdb_extensions\diagnostics\diag.py. 2. Go to line 700 and add the following line "time.sleep(1)" (immediately after self.ta.disconnect()).
Defect	DTDBG-3634	It takes too long time to launch CW ARMv8 Windows Host when CWTAP is plugged in USB port <i>Workaround: remove CWTap for USB port or wait for 1minute for CW to start</i>
Defect	DTDBG-4241	Connect to target doesn't work after you used Scenario Tools <i>Workaround: After using Scenario Tools, close CodeWarrior IDE and start it again. (Do not use Restart from CW menu).</i>

**NOTE:** A known issue with JRE7 based CW-ARMv8 11.2.x series and Yocto based Linux distributions has been resolved in the JRE8 based CW-ARMv8 v11.3.x series. Workaround below may not be required in v11.3.x but still listed:

Several connection problems might be encountered when trying to debug a Linux application with Eclipse. They are caused by the existing implementation of SSH client in Eclipse plus the limitations of JRE 7. Problems can be worked around by applying some special configurations to the SSH server on target.

Solutions:

- "diffie-hellman-group1-sha1" key exchange parameter needs to be enabled in SSH server. This can be done either by adding in sshd\_config file a line containing "KexAlgorithms+=diffie-hellman-group1-sha1" or by starting a new SSH server instance on a non-default port by using "/usr/sbin/sshd -o KexAlgorithms+=diffie-hellman-group1-sha1 -p 22222".
- If an 1024-bit Diffie-Hellman key is necessary on the target and it can't be generated based on the existing /etc/ssh/moduli file, a new moduli file needs to be generated by using the commands below. Replacing the system-wide moduli file with the output file moduli-1024 is then required.
  - ssh-keygen -G moduli-1024.candidates -b 1024
  - ssh-keygen -T moduli-1024 -f moduli-1024.candidates
- Root access is controlled by PermitRootLogin preference. Its value needs to be set to "yes" either by adding "PermitRootLogin yes" in sshd\_config file or by starting the new SSH instance with "PermitRootLogin=yes".

After applying the changes described above, SSH server needs to be restarted.

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