

GURUCE IMX6 BSP RELEASE NOTES

FOR THE WEC7 & WEC2013 EVALUATION IMAGES AND FULL SOURCE BSP

Release 2391

Tuesday, 21 May 2019

TABLE OF CONTENTS

Release Contents	1
iMX6 BSP Release Notes.pdf	1
GuruCE iMX6 Getting Started Guide.pdf.....	1
Evaluation Images	1
Special Release Instructions	2
Release 2391	2
Update Level	2
Instructions	2
Release 2034	2
Update Level	2
Instructions	2
Release 1375	3
Release 1100	3
Changelist	4
Release 2391	4
New Features	4
New Drivers	4
New Boards.....	4
Performance & Code Upgrades	5
Bug Fixes	7
Release 2034	9
New Features	9
New Drivers	10
New Boards.....	10
Performance & Code Upgrades	11
Bug Fixes	14
Release 1375	16
Release 1100	19
Release 954	20
Release 550	23
Release 474	24
Release 406	24
Release 363	24
Release 299	25
Release 282	25
Known Issues and Limitations	26
Support	28

RELEASE CONTENTS

The contents of the release packages are described below.

The latest release can always be found at this link: <https://guruce.com/imx6/latest>

The release packages:

1. iMX6 BSP Release Notes.pdf
2. GuruCE iMX6 Getting Started Guide.pdf
3. Evaluation Images

IMX6 BSP RELEASE NOTES.PDF

This document.

GURUCE IMX6 GETTING STARTED GUIDE.PDF

The GuruCE iMX6 Getting Started Guide is a step-by-step guide to help you get started with the GuruCE iMX6 Full Source BSP and the Windows Embedded Compact evaluation images so you can evaluate our BSP on various off-the-shelf iMX6 boards.

EVALUATION IMAGES

GuruCE iMX6 BSP WEC7 and WEC2013 evaluation images for various off-the-shelf iMX6 boards can be downloaded from our website at <https://guruce.com/imx6/latest>

Historic releases can be found here: <https://guruce.com/imx6-bsp-releases>.

Please note that our license does not allow the use of our evaluation images and accompanying tools for anything other than evaluating the GuruCE iMX6 BSP. In other words; the evaluation images and tools cannot be used in, or for preparation of, production devices!

SPECIAL RELEASE INSTRUCTIONS

RELEASE 2391

UPDATE LEVEL

The evaluation kernels of this release are built with updates up to:

- WEC7
Update 71, March 2019 (v7.5.2889.0)
- WEC2013
Update 61, March 2019 (v8.4.6277.0)

INSTRUCTIONS

- Various changes to the board header file definitions. Please look at one of the provided board header files to make sure you understand all the changes you need to make in your custom board header file (or contact us to make those changes for you).
- The bootloader menu has been optimized with better grouping of functionality making it easier to find options.
- All evaluation kernels now have HAB enabled. Due to an iMX6 ULL erratum (ERR010449), you need to set fuse BT_MMU_DISABLE (bit 1 of OCOTP_CFG6) to get HAB to pass on the MXIMX6ULL EVK. This is easily done using our bootloader. Enter the [B]ootloader shell and type "fw 0x07 0x02" (without the quotes), followed by ENTER. Note that this **only applies to the iMX6 ULL!**

RELEASE 2034

UPDATE LEVEL

The evaluation kernels of this release are built with updates up to:

- WEC7
Update 67, March 2018 Wave 5 (v7.5.2882.0)
- WEC2013
Update 53, April 2018 (v8.3.6261.0)

INSTRUCTIONS

- Various changes to the board header file definitions. Please look at one of the provided board header files to make sure you understand all the changes you need to make in your custom board header file (or contact us to make those changes for you). More details below:
- When adding support for ULL, we had to rename some ENET definitions and some PIN and PAD definitions to allow re-use of header files between S/DL/D/DP/Q/QP and UL/ULL, so some definitions will need to be renamed in your custom board header file.
- All calls to OALxxxx functions have to be renamed to DDKxxxx. Code was duplicated for use in bootloader, KITL and low-level kernel (OAL) and drivers (DDK). We now have a single code base that can be used everywhere.
- Every board now has a boardname.reg file that contains any board specific registry settings. For instance, default touch calibration data is now located in the board specific registry file.

RELEASE 1375

The evaluation kernels of this release are built with updates up to:

- WEC7
December 2016 (v7.2.2872.0)
- WEC2013
December 2016 (v8.2.6243.0)

No further special instructions for this release.

RELEASE 1100

This release changes the memory layout to support boot splash images in the reserved system partition (where eboot and NK live). Due to this memory layout change you can't simply update eboot from eboot (because the previous release eboot will think the new eboot is destined for the wrong medium). The quickest way to update the bootloader to this release is to first build a bootloader for use with the MfgTool (select 'Boot using MfgTool' in the GuruCE i.MX6 BSP catalog under Config->Bootloader) and rebuild the bootloader folder. Copy the resulting eboot.nb0 to the correct MfgTool profiles folder (make sure cfg.ini in the MfgTool folder is configured properly as well), then press [R][1] on the device running a previous release bootloader, then start MfgTool. After clicking the Start button in MfgTool, it will load the new release bootloader in the device memory and break into the bootloader menu. Now select the correct bootloader target medium (select 'Boot from NAND/SATA/SD/MMC or SPI Flash' in the GuruCE i.MX6 BSP catalog under Config->Bootloader) and rebuild the bootloader folder again. Now press [D] in the bootloader menu and upload the bootloader to the device using Platform Builder (or CEloader). When the upload is complete the device will ask you to flash the new release bootloader to the device.

Alternatively, follow the (much longer) procedure in chapter 'FLASHING THE GURUCE IMX6 EVALUATION IMAGES' in the GuruCE i.MX6 Getting Started Guide.

CHANGELIST

RELEASE 2391

NEW FEATURES

- High Assurance Boot (HAB), completely integrated into the build system and BSP catalog.
- 100% flicker-free display transition from bootloader splash to CE desktop, also in multi-display configurations and also for HDMI monitors.
- Silent boot; boot without any serial output and without delay. Bootloader menu only shows when the correct password is sent at power-up, using the Silent Boot Breaker (full source code provided).
- Implemented fix for kernel handle table locking bug, see <https://guruce.com/blogpost/windows-embedded-compact-is-not-an-rtos> and <https://guruce.com/blogpost/tls-12-support-and-fix-for-rtos-bug-released-for-wec2013>
- Added EEMBC's CoreMark® benchmark.
- Added RegExport utility.
- Added SafeRemove utility.
- Added Format utility.
- Added managed C# version of CE Remote Host (cerhostm.exe), including full source code.
- BSP revision, bootloader version and build date/time now available in registry under HKLM\Platform.
- Added enable_usb_serial_kitl.cmd to make it easy to stop Windows Mobile services (so you can use super-fast USB Serial for KITL).
- Added cleansubprojects.cmd to make it easier to switch OS versions and not get build errors when building subprojects (due to mismatched build.dat files).

NEW DRIVERS

- Added support for the NEC NL4827HC19-05A 4.3" 480x272 LCD display.
- Added support for LCD8000-97C 9.7" Capacitive Multi-Touch 1024x768 display.
- Added support for the ET043080DH6-GP 4.3" 480x272 display.
- Added support for the STMPE811 touch controller.
- Added support for the CT36x touch controller.
- Added support for the BQ32000 RTC chip.
- Added support for EDT M06, M09 and M12 PolyTouch controllers.
- Added RTT driver to show the kernel handle table locking bug.
- Added support for MX25L6445E NOR Flash.
- Added support for Emtrion TX14D17 5.7" 640x480 LCD.
- Added support for AR1020 resistive touch controller.
- Added support for the SSD2533 touch chip.
- Added support for the DS1377 RTC chip.
- Added support for the DS3231 RTC chip.
- Updated WEC2013 conmgr binaries to latest.
- Updated GPU driver to v5.0.16.0.
- Added WDOG driver.
- Updated SDMA driver scripts to latest and added more mem2mem SDMA scripts to support memory mapped FIFOs (src->dst, src+->dst and src->dst++).

NEW BOARDS

- Added support for the iWave IW-RainBow-G15M-SM SOM and devkit.
- Added support for Emtrion DIMM-MX6DL on a Lohtron base board.
- Added support for Advantech DMS-BA16 module on a Q7 DVB.

PERFORMANCE & CODE UPGRADES

- Added option to dump more than a single register in the bootshell.
- Added definitions for DDR pad voltage selection.
- Added RTC chip items in the catalog.
- Added GPR13 definitions to mx6sdl_iomux.h.
- NAND options in bootloader menu now only shown when bootloader was built with NAND support.
- Code in bspargs.c now not displaying IMAGE_SHARE_VIDEO_RAM defines if no video ram reserved.
- Removed stale code in cspnand.c.
- Changed 1280x800 LVDS display modes to work with Boundary Devices displays.
- By default output New Calibration data message in non WINCESHIP builds.
- Backlight driver now determines if backlight duty cycle should be inverted by looking at the GPIO level setting of the PWM signal.
- Now always using external RTCs alarm functionality if RTC supports it. Only using internal SOC alarm if external RTC does not support alarms.
- Now only erasing/writing/verifying sectors that need to be erased/written/verified when flashing SPI bootloader.
- Removed SATA_HD definitions from catalog (not used anymore).
- Bootloader now not requiring correct MAC to be set when using USB Serial.
- Now retrying commands sent to AR1020 touch controller if they fail the first time.
- Manufacturing bootloader no longer resets to default boot config.
- Updated CEWriter to convert splash images to 32bpp by default.
- Boot splash images now supported in both 24bpp and 32bpp. 32 bpp is preferred because the bootloader now sets the display in 32 bpp mode (so we can switch 100% flicker-free to the CE desktop and use the same framebuffer).
- Now not erasing framebuffer on mode change.
- Now getting disable DMA setting from registry in USDHC driver code.
- Increased DEFAULT_MAX_SLOT_CURRENT to 400 mA in USDHC driver.
- Renamed Wait4CF to Wait4WMGR in AutoExec subproject (because that is what it actually does).
- Removed Serial KITL Configuration; not used anymore.
- Added bForce parameter to ClockInit function to avoid warning message in bootloader.
- Bound mouse to display boundaries in multi-display configurations.
- Removed unnecessary warning message in ioctl.c.
- Now allowing to set OAL watchdog thread priority.
- Better output of cleanbsp.cmd.
- Changed BLMapMemory function to allow specifying VA to map PA on.
- Changed IRAM definitions to OCRAM to keep it consistent with the RM naming.
- Removed fake addresses VA display in bspargs.c as they will always be 0 (no PT mapping for fake addresses).
- Updated baseregs.c to match all multiple instance modules in all iMX6 series we support.
- Increased performance of SDMA by setting OCRAM memory to normal uncached memory (instead of strongly ordered).

- Increased performance of I2C sync mechanism by setting OCRAM memory to normal uncached memory (instead of strongly ordered).
- Added common definitions for JTAG_TRAP and SPIN_FOREVER.
- Renamed all anatop references to analog.
- Removed all references to DVFS module (removed from iMX6 RM due to HW implementation problems).
- Added multiple inclusion protections to all .inc files.
- More detailed naming and more precise mapping of all memory and I/O in all iMX6 series.
- Made sure all globals in ipuv3_basemdd.cpp are initialized and not left uninitialized.
- Moved inclusion of processor specific assembler constants into mx6_ARM_const.inc.
- Added readme.txt to ConMGR subproject to explain solutions to the Remote Tools problem in WEC2013 when ConMGR subproject is included in the OS Design.
- Removed WEC7/WEC2013 conditionals in ce_startup.s; not needed.
- Now always including ConMGR files (no more depending on GWES, apart from ddi_nop).
- Remove BSP_XRPLUGIN_OPENGL from board configurations (don't force this selection, let customer decide).
- Small improvements to reloaddrv.
- Fixed function header comments in ipuv3_base_sdk.cpp.
- Ethernet driver now not loading if MAC address not set.
- Added GPTGet/SetOCRValue functions to the GPT driver.
- Made CPUload priority configurable via a #define.
- Moved many subprojects to BSP apps folder, and made all apps and tests selectable in the catalog.
- Made all SDK headers thread safe.
- Removed now RESERVED (in latest rev RMs) info from mx6info struct.
- Now using correct chip revision field for determination of HAB ROM API table location.
- Added a bit more error output when loading of a bmp goes wrong.
- Refactoring and re-ordering of bootloader menu.
- Added option to configure all Ethernet interfaces in the bootloader.
- Better handling of KITL options throughout the code.
- Added IOCTL_HAL_GET_RNDIS_MACADDR so that RNDIS driver can get configured MAC from bootloader.
- Now using EPIT1 as system timer, with option for variable tick timer implementation.
- Added CheckTicks test application.
- Fixed implementation of ENET and PHY code when multiple instances of ENET are possible (like on iMX6ULL).
- Commented out "Reconfiguring signal to in/output!" messages in devtree.cpp.
- Added blank lines in usdhc.reg to split blocks of reg info.
- Added Show iMX6 Info to bootloader menu.
- Increased delay from 15 ms to 175 ms to settle MII frequency (required for some PHYs).
- Changed NKSetTime function in kern.dll to allow setting of ms.
- Added file system options to storage media in catalog and .reg files.
- Added registry settings to platform.reg to allow running .bat and .cmd files automatically.
- Clarified some bootloader menu options.
- Upgraded heartbeat code to support multi-core.
- Fixed several issues in cerdisp resulting in improved performance.
- Removed ZONE_INFO from active Ethernet driver debug zones.

- Moved UART and USDHC configuration items from bsp_cfg.h to catalog.
- Added UINT16 register capability to I2CReadData in touch framework.
- Moved "PartitionDriver" value up to be consistent with all storage profiled.
- Made GPIO sources files more consistent with other drivers.
- Set BSP_RTC_M41T8X for all Opal boards configurations.
- Renamed Colibri to Colibri-DL.
- Updated CEWriter with options for formatting and more lenient checking of partitions.
- Renamed VAR-SOM-DQ to VAR-SOM-MX6 to align with Variscite naming.
- Moved RTC items from Config section to "Device Drivers" in the catalog.
- Now always setting the SMP bit in ACTRL.
- Now also calling OALL1CacheInit in bootloader main.c.
- Updated CEWriter (now properly detecting new boot config signatures, various minor usability changes).
- Added default calibration data for LCD8000-97C 9.7" Capacitive Multi-Touch 1024x768 Display to Nitrogen6X.reg.
- Added default touch calibration data to the Opal6 boards (for use with the SDP LVDS displays).
- Bootloader is not not repartitioning the drive if 136MB RESERVED section is found at start of drive.
- Duplicated LVDS resolutions for both 18bpp and 24bpp.
- Updated Opal L2 cut-off frequencies.

BUG FIXES

- Fixed RAW NAND detection.
- Fixed display initialization for LCDs on DISP1.
- Fixed bug in ivt_init for UL/ULL.
- Fixed bug in sdfat.c that resulted in deleted files to be found and loaded.
- Fixed camera mux setup in IOMUX_GPR for SDL. CMOS cameras now work for both DQ and SDL.
- Fixed CETouchView dependency in the catalog.
- Fixed minor issue in CPUload subproject.
- Fixed name-mangling potential issue in FLASHUPD.
- Fixed DISPO_CONTRAST GPIO setting in Nitrogen6X.h.
- Fixed bug in eboot.bib.
- Fixed memory leak in i2ctouch.cpp.
- Fixed bug in bspusdhc.cpp.
- Fixed ActiveSync connection.
- Fixed Ethernet settings not being passed and set correctly when using USB Serial for KITL.
- Fixed prefetch abort in AIC310X audio driver code (when init fails and driver unloads).
- Fixed potential issue in ROUND_DIV macro in mx6_ddk.h.
- Fixed GPIO safe masks for various iMX6 cores.
- Fixed GPIO SDK header file for inclusion in ANSI C files.
- Fixed bug in IPUV3\DDRAW\MDD\DisplayDriver.cpp.
- Fixed bug in calculation of IMAGE_BOOT_UNUSED_OCRAM_SIZE.
- Fixed memory leak in GPU driver when using OpenGL XAML renderer
- Fixed touch driver setting when defaults are set for display in bootcfg.c
- Fixed bug in bspenet.cpp.
- Fixed REG_MULTI_SZ writing of IP addresses in ioctl.c.
- Fixed several Ethernet related issues in the bootloader.

- Fixed USB RNDIS initialization in ether.c.
- Fixed naming of ISL2020 (now correct; ISL12020).
- Fixed NAND bootloader menu.
- Fixed overflow in loader.c:DetectRAM function on boards with 4GB of memory.
- Fixed DefaultFileSystem setting for NAND, SATA and USDHC.
- Fixed issue in TEMPLATE driver SDK code.
- Fixed definitions in common_wdog.h.
- Fixed OAL watchdog code in watchdog.c.
- Now correctly setting DTE for UARTS in Colibri-DL Set Config option.
- Fixed reset reason determination for watchdog timeout on ULL.

RELEASE 2034

NEW FEATURES

- Added support for iMX6 UL/ULL.
- Added display clone feature (we now support extended display and cloning of the primary display to the secondary display, including scaling if required).
- Added CE Updater library and application, to allow updating of bootloader, splash screen and kernel from within CE.
- Added full (up to 16 points) multi-touch and custom calibration point support to all touch drivers.
- Complete rewrite and verification of clocking code so that it is now much easier to follow the RMs clock tree diagram and much easier to debug and maintain.
- Complete rewrite of USBDBG driver code. We now have very high-speed download and KITL debug connections over USB RNDIS or USB Serial (we recommend using USB Serial for download and debug from Visual Studio / Platform Builder).
- Automatic formatting & partitioning of stores to greatly simplify hive-based registry scenarios.
- Added support for Gigabit Ethernet (on selected boards).
- Added OAL IOCTL for retrieving BSP arguments.
- Added support for higher CPU frequencies.
- Added support for CE Remote Display (CERDISP) in both WEC7 and WEC2013.
- Added USBFn.exe; an application to quickly change USB function (serial, RNDIS, storage or disabled).
- Implemented feature that allows you to copy the system partition (bootloader, kernel, splash image & boot config) from SD to eMMC (so you can use CEWriter to flash to SD card, then boot from SD, copy to eMMC and then boot from eMMC without the need for Ethernet or USB).
- Added progress callback functionality to SDHCRead/WriteSystemPartition.
- Added support for gradientfill and alphablend in multi-monitor configurations.
- Added functionality to the MEMTOOL application to dump clock frequencies/clock gates and the clock tree.
- Added functionality to the bootloader shell to dump a single NAND sector, dump a complete NAND block and dump NAND information.
- Added many more maintenance functions to the bootloader NAND submenu.
- All reboot code now setting WARM_BOOT bit when software initiates the reset so we can distinguish between a hard (power-on) reset, a software initiated reset, a watchdog timeout and a ROM-watchdog timeout reset.
- Added MX6 Info Application (showing how to get and display MX6 info from IOCTL_HAL_QUERY_MX6_INFO).
- CEWriter now allows bootloader and kernel images to be written to disk no matter what the intended destination was. A warning message is still displayed to the user. Use with care!
- Added board specific registry files for board specific registry settings.

NEW DRIVERS

- Added iMX6 ULL display driver.
- Added iMX6 ULL ADC driver.
- Added iMX6 ULL TSC touch driver.
- Added PWM driver and example application.
- Added TEMPLATE driver (this is a template you can use to develop high quality and fully production ready stream-interface drivers for CE).
- Added support for FocalTech FT5x06 touch controller.
- Added support for WM8962 audio codec.
- Added support for AIC310X audio codec.
- Added support for N25Q032A SPI NOR Flash.
- Added support for KSZ8081 Ethernet PHY.
- Added support for LAN8742 Ethernet PHY.
- Added support for PCF8523 RTC.
- Added support for DS1338 RTC.
- Added support for RX8010SJ RTC.
- Added support for MT29F4G08ABADA and MT29F4G08ABAEA NAND
- Added support for NAND flashes with 4K+224 pages.
- Added DDR JTAG script for Variscite board.
- Added support for Tianma TM035KBH02-09 3.5" 320x240 LCD.
- Added HDMI 1024x600 and 1280x800 resolution (for WaveShare display).
- Updated FTDI USB-to-Serial driver to v1.1.0.22.
- Updated to latest version of CoreCon for WEC2013.
- Updated MfgTool2 to latest version from NXP (this fixes the crash when breaking the USB connection while MfgTool2 is running).

NEW BOARDS

- Added support for NXP MCIMX6ULLEVK board.
- Added support for ConnectCore6 DualLite.
- Added support for Variscite SOM-D/Q board.
- Added support for Variscite SOM-S/DL board.
- Added support for Opal6-S.

PERFORMANCE & CODE UPGRADES

- Improved performance of NAND driver.
- Improved performance of USDHC driver.
- Now using DebugZone Template and made all debug output consistent in SDBUS, SDCARD, SDCardLib and USDHC.
- All SD related code now has a single point of exit to allow proper function tracing.
- Implemented BLMemory so that bootloader and KITL code can map & remap memory as required.
- Bootloader is now initializing the boot timer earlier in the boot process so that board specific initialization code can make use of the boot timer.
- Moved board specific initialization before the first bootloader serial output (some boards require some initialization of the serial debug port).
- Bootloader now always outputting an error is setting the ARM CPU speed to the speedgrade failed (usually because VDDARM and/or VDDSOC are too low to support the higher frequency).
- Cleaned up menu.cpp code in the bootloader.
- Bootloader reset now always waiting for all characters to be pushed out of the UART before doing the reset to prevent garbled output.
- Improved USB disk driver (now supporting reads of more than 0xFFFF sectors).
- Replaced all OALxxx calls with DDKxxx calls (we now have a single library for both OAL and DDK functions).
- Updated timer code to work on both Cortex-A7 and Cortex-A9.
- Updated MemoryTest code in bootshell to work on both Cortex-A7 and Cortex-A9.
- Updated CacheTest code in bootshell to work on both Cortex-A7 and Cortex-A9.
- Updated clockout code in bootshell to work on both Cortex-A7 and Cortex-A9.
- Updated EBOOT display code to properly maintain caches on the video frame buffer.
- GIC code is now using GICv2 naming convention.
- Bootloader now cleaning L2 just before jump to kernel image if L2 is enabled.
- Updated memory layout so we have enough memory reserved for KITL DMA (whether that's Ethernet, USB RNDIS or USB Serial).
- Updated bootloader menu code to work correctly for both ULL and SDL/DQ/DQP.
- Renamed and moved some BSP folders to better indicate the contents or purpose.
- Now properly initializing the watchdog at the start of bootloader code.
- Cleaned up SDMMC code.
- Synchronized GPT defines between ULL and SDL/DQ/DQP.
- Added support for multiple GPT driver instances.
- Moved all drivers in folder 'Others' in catalog to their own folders.
- All globals now in globals.cpp.
- Optimized data cache code.
- Cleaned up parts of USB code (and added support for multiple OTG instances as used on ULL).
- Increased bootloader args version (because of addition of 2nd MAC address in BOOT_CFG).
- Cleaned up OAL init code.
- Moved PCIe code to its own folder in OAL.
- Replaced all direct accesses to the clock tree data with proper calls to DDKGet/SetFreq.
- Cleaned up OAL watchdog code.
- Added DDKDevTreeSetupGPIOInterruptLevel to exports for cspddk.dll.
- Now always setting the MAC address, even if "Copy Network Settings to CE" is disabled.

- Added more fuse options in the bootloader shell.
- Cleaned up and improved backlight driver code (now uses PWM driver to handle LCD backlight).
- Catalog options not available on certain CPU types now show a red cross when selected in the catalog.
- Manufacturing Tool bootloader now always using reset-default boot configuration.
- OALVAtPA in bootloader MEMORY/memory.cpp now supports high memory VAs.
- (Re)implemented EB821 LDB Clock Switch Procedure to prevent LVDS display sometimes not coming up.
- Backlight is now only enabled if primary or secondary port is a non-hdmi port (so only enable backlight if one of the ports is configured as LCD/LVDS).
- Updated CEWriter to write custom MBR code.
- Reverted CEWriter partition back to FAT32 (instead of exFAT) to keep it in sync with the bootloader.
- Added cleanup.cmd that cleans up OS Designs (and saves space on your PC).
- Updated and synchronized OS Designs.
- Renamed AutoFormat application to FormatAll (and added catalog item for this).
- Added storage configuration options for Auto Mount, Auto Part, Auto Format and Auto Scan (defaults all unchecked).
- Updated bootloader menu output to be clearer and more consistent.
- Added custom MBR x86 assembly code.
- Updated and synchronized usdhc.reg, sata.reg and nand.reg.
- CEWriter now correctly detecting any version of the bootcfg structure.
- Moved ConfigMagicNumber to top of BOOT_CFG so that the magic number is now always at the very start of the boot config reserved space.
- Increased EBOOT_CFG_MAGIC_NUMBER because we changed BOOT_CFG structure.
- Power manager settings now in pm.reg.
- Some naming changes to Opal board files to make it clearer what boards are supported.
- Minor indentation changes in some board header files.
- Set ROMSIZE to 1 MB in eboot.bib (size of final eboot.nb0 will be 0x000FF000 after cutting off 4 KB at start).
- Now also creating file system partition when storing boot config.
- KSZ9021.cpp PHY code now supports 1 GBps.
- Added VLDO6 and BBAT defines to da9063.h.
- Made DDKDevTree function call naming more consistent and added some more DDKDevTree functions.
- Modified all code using the DDKDevTree functions to use the new, consistent function naming.
- Increased supported number of IRQs per SYSINTR from 4 to 8.
- Lowered active debug zones for IPU.
- Made order of #if defined BSP_IMX6* statements consistent across all source files.
- Changed all #else in relation to BSP_IMX6 defines to #elif defined.
- Now using proper indentation for #if #elif #endif.
- Replaced most #ifdef's with #if defined.
- Removed unsupported chip types from mx6_info.c (and changed order from small to big).
- Renamed DDK_DMA_REQ_GPT to DDK_DMA_REQ_GPT1 on SDL/DQ/DQP.
- DDKDevTreeSetMuxAsGPIOInterruptLevel now not clearing and enabling interrupt anymore.
- Moved code for clearing and enabling interrupt to DDKDevTreeSetupMuxAsGPIOInterrupt.
- Updated status output in CEWriter.exe to clarify what has happened.
- Moved all driver def files to the PDD folder.

- Updated Getting Started Guide to properly indicate correct SW6 switch settings to boot from MMC on SDP/SDB boards.
- Created single point of enabling/disabling the clocks for IPUV3 in kernel and bootloader.
- Closing all clock gates not needed for further boot when bootloader has started.
- Fixed clock reference in sata.c.
- Reduced USDHC detection timeout to 2 seconds and fixed bootloader 'hang' when trying to initialize a non-existing/not-used USDHC controller.
- Improved clock reference counting in all drivers.
- Cleaned up ENET code.
- Cleaned up VPU clock sequence.
- Improved CAN clock deinitialization and clock reference counting.
- Simplified and centralized NAND initialization.
- Cloned TCHSTREAMMDD from public tree to fix the debug zones for the touch driver; all touch drivers are now using the same DEBUGZONES.
- Moved `_purecall`, `new` and `delete` functions to bootloader and KITL stub libraries.
- Renamed `stubs.c` to `stubs.cpp`.
- Added support for turning USB PLLs on and off.
- PLL frequency now returns 0 if PLL is disabled or powered off.
- Better alignment of speed string (UTILS/Utils.c).
- No more checking for "expected" PLL values.
- Removed unused `#defines` from `bsp_clocks.h`.
- GPIO interrupts are now acknowledged in `OEMInterruptHandler`.
- All Ethernet PHYs now advertise flow control.
- Synced USB OC implementation for Host controller.
- Update GPU tutorial sources files to skip build when `BSP_NOGPU` defined.
- Cloned `OALOG` library (`log.c` and `debug.c`) so we can output longer debug strings.
- Commented `BSP_ENET_DISABLE_GIGABIT=1` in `GuruCE_iMX6.bat` (so Gbps Ethernet is now enable by default for PHYs that support it).
- Modified `KSZ9021` and `KSZ9031` to use Symmetric pause frames only (see chip errata).
- Made `BLMenu` function names consistent.
- Extended flash info struct with NAND chip name.
- Added update IOCTLS in NAND driver.
- Moved NAND functions to common library because they are used in CE and the bootloader.
- Added methods to NAND driver to allow updating of the bootloader, splash and kernel binaries in NAND from CE.
- Fixed USDHC card detect in all situations.
- Changed all reboot code from `WDOG` timeout to using `WDOG_SRS` bit.
- Added `IOCTL_HAL_QUERY_MX6_INFO` to application allowed IOCTLS.
- Removed `BSP_RAM_1G` from Nitrogen6X board config (because this board comes in various RAM size configs).
- Added RAM info output to MX6 Info prints.
- Added reset reason output to mx6 info output in bootloader and kernel.
- Cleaned up and fixed main bootloader flow code.
- Tiny bootloader now sets `WARM_BOOT` bit (to indicate it is a software-initiated reset).
- Added reset reason bitmasks to src header files.
- Removed all old `USBDBG_RNDIS` and `USBDBG_Serial` code, including all unnecessary cloned code (like `USBDBG_RNDISPDD/MDD`, `RNE_MDD`, etc.).

- NAND options in bootloader menu are now only present if NAND is selected in the catalog.
- Added full power manager to all OS Designs (needed for reset functionality).
- Improved OpenGL XAML renderer code.
- Added more functionality to PF0100 PMIC driver code.
- Removed SATA HD/CDROM selection from the catalog. This is not needed (detected automatically).
- Fixed Reset to SATA setup to be as per defaults mentioned in the RM.
- Added menu option to format SATA.
- Bootloader is now correctly initializing only the required medium (because booted from or redirected to).
- Made bootloader output more consistent.
- Fixed bug where some settings were not transferred to CE if the settings were not saved in the bootloader menu.
- NAND Flash Layout defines now correctly output in bootloader shell.
- Added NAND menu option to reinitialize NAND (to write FMD structures after an erase for instance).
- All GPU samples can now be exited by pressing the ESC key.
- Added ROUNDUP_DIV macro to mx6_ddk.h.
- Better error output in es11_overlay (now tells user clone mode may be enabled if overlay fails).
- Added catalog item for easy inclusion and registry configuration of the CETouchView application.
- CEWriter now recognizes images destined for NAND as well.
- All board header files now setting BSP_L2_CUTOFF_SIZE to the optimum value for that particular board.

BUG FIXES

- Fixed PLL4 Audio post divider logic on Dual/Quad.
- Fixed issue with MT418X RTC code.
- Fixed multi-core deadlock in SDBUS.
- Fixed UART clocking logic (so serial debug output always keeps working).
- Increased L2 cache latencies with 1 cycle to prevent issues on some boards.
- Fixed potential synchronization issues in data and tlb cache routines.
- Fixed bug in EnablePFD clock code.
- Cleaned up and fixed several issues in the ENET code.
- Fixed issue where 16-byte-multiple UART transfers would stall.
- Cleaned up and fixed several issues in the touch driver code.
- Fixed required CLI dependencies in Set Config catalog options.
- Fixed SD/MMC and SATA partitioning code.
- Fixed problem with erasing some SD/MMC cards.
- Fixed inconsistent output for IMAGE_NAND_RESERVED_SIZE in bspargs.c.
- Some fixes in CATALOG/GuruCE_iMX6.pbcxml.
- Some fixes in platform.bib.
- Moved ADC definitions to correct place in DevTreeDefs.h.
- Fixed a bug in DDKDevTreeSetMuxAsGPIOInterruptLevel.
- Fixed ANAR_PAUSE definitions in common_enet_phy.h.
- Fixed bug in clocks.cpp relating to DDK_CLOCK_SIGNAL_PLL6_125M code for ULL.

- Fixed bug in DDKDevTreeClearMuxAsGPIOIntr.
- Fixed dependency problem on WEC7 (networking components depend on SYSGEN_IPHLPAPI but this is not dealt with correctly by WEC7).
- Fixed bug in splash screen bitmap reader code.
- Fixed initialization sequence for LCDIF (ULL).
- Fixed camera deinitialization.
- Fixed deinitialization sequence for USB OTG IST.
- Fixed includes in VPU driver.
- Fixed bug in CAN driver.
- Fixed bug in NAND initialization.
- Fixed NAND boot detection.
- Fixed clock initialization in NAND driver.
- Fixed two bugs in MEMTOOL driver.
- Commented out some weird code in Microsoft's PCIcfg.c (was causing issues for some cards).
- Fixed spurious interrupt issue.
- Fixed some problems in i2cutils and general cleanup of that code.
- Fixed USB OC polarity bug for OTG controller.
- Fixed bug in ENET code.
- Fixed mouse trails in configurations with multiple monitors.
- Fixed NANDLoad/SaveBootCfg functions.
- Fixed uninitialized variable bug in watchdog.c.
- Fixed bug in PCIbus/sources.
- Fixed some bugs in SDP board header files.
- Fixed missing call to ConfigRefClock in ENET driver code.
- Cleaned up and fixed numerous issues in ataboot, atafmd.c, atafmd.h, sata.c, nand.c, nandboot.c, and sdboot.c.
- Fixed wrong defines in nand_layout.h.
- Tiny bootloader now supports configurable flash destination and redirection.
- Added catalog selections for tinyboot flash destination and redirection.
- Set backlight PWM frequency to 50 kHz on all boards to fix audible noise.
- Fixed CABC_EN signal allocations in SDP board header files. Now Content Aware Backlight Control is really turned off.
- Fixed flashupd to compare store names case-insensitive.
- Improved cache and memory tests in bootloader shell.
- Fixed bug in SDIO driver function SDEnableDisableFunction.
- Fixed bug in DHCP setting when using USB Serial for KITL.
- Fixed sporadic issue with synchronizing external RTCs with internal iMX6 SOC.

RELEASE 1375

- Updated GPU driver to 5.0.15.
- Improved upload, flash and boot times by ~50%.
- Added support for LZ4 compressed kernel binaries to the bootloader.
- Added support for setting ARM CPU frequency and accompanying LDO voltage.
- Now setting ARM CPU frequency according to speed grade in the bootloader.
- Added option to the catalog to disable setting the CPU frequency to the speed grade in the bootloader.
- Added options for setting default catalog selections per board.
- Added board voltages to all board header files.
- Optimized bootloader cache settings (L1/L2) to shorten boot time.
- Bootloader boot delay can now be set to 0 to shorten boot time.
- Added options to the catalog to disable L1/L2 cache optimizations in the bootloader.
- Added support for storage profiles per USDHC instance. This means that SD cards always get mounted using the same folder name, no matter in what order they are inserted, and we can now specify exactly which USDHC port to store the hive-based registry on or exactly which USDHC port to mount as root.
- Added support for NXP SDB-QP (QuadPlus) board.
- Added support for Device Solutions Opal6-QP (QuadPlus) board.
- USB OTG Client/Host auto-detection now working.
- Removed 'INFO:' from all bootloader debug output.
- Fixed boot splash image loading after a factory reset.
- Added PackBin - a tool to LZ4 compress NK.bin to NKlz4.bin.
- Added TinyBoot bootloader. This is an SPI bootloader that just resets the i.MX6 and directs it to boot from the medium selected in the catalog.
- Now always initializing SPI Flash if it is supposed to be on the board. This allows easy switching between the tinyboot.bin (SPI redirect) bootloader, to the SD/MMC, SATA, or NAND bootloader, and back again to a normal SPI bootloader.
- USB over-current signal polarities now configurable through board header files.
- Now suppressing "SoftRTC" debug message output on CE8 kernels.
- Now always building GPU tutorials (unless building a headless design).
- SD card detection using DAT3 as CD now works properly on all boards except ConnectCore6 (CC6 hardware design prevents using DAT3 as CD).
- Added PMIC selection to catalog.
- Added DA9063 driver to the BSP.
- Fixed wrong voltage calculation in PF0100 PMIC code.
- Fixed bug in memtool driver.
- Fixed I2C pin muxing in Conga-QMX6. HDMI auto-detection now working correctly.
- Fixed build error when no SPI Flash supported at all.
- Now clearing ENET MII interrupt before creating a new command frame.
- Now always initializing heap and clock structures, not just when we have display. We can now show the clock tree, even in headless bootloader builds.
- Fixed ENFC, PRE and PRG clock initializations.
- Fixed MAX_BAUD_LEAF define. ENFC now has 8 leafs, so increased this from 6 to 8.
- Improved clock tree dump output.

- Added size member to DDK_CLK_CONFIG structure to easier detect changes in this structure (and possible mismatched between bootloader and kernel).
- Setting frequency of a clock signal that is in use but has the same frequency already is now not an error any more.
- Fixed Opal6 USDHC port definitions.
- Fixed Opal6-Q UART IOMUXing.
- Fixed bug in GPIO5 interrupt handler code.
- Fixed bug in DevTree GPIO interrupt setup code.
- Added support for PCIe 100 MHz/125 MHz clock configuration.
- Now setting PCIe ref clock to 100 MHz for S/DL and to 125 MHz for D/DP/Q/QP.
- Now setting PCIe PHY configuration as per NXP recommendations.
- Now marking PCIe IRQs as shareable.
- Fixed bootshell code for CKO dividers of PLLs.
- PLL4, PLL5 and PLL6 will now be powered if you set a frequency other than 0.
- Now supporting CKO2 to CKO1 pad routing.
- Fixed potential problem with BusEnum2 registry settings.
- Implemented LDB Clock Switch Procedure for i.MX6 according to EB821.
- Now allowing conditional compile of Ethernet code with or without caching (without is default as it has better performance).
- Added missing PMIC_I2C_SPEED definition in PF0100.h.
- Removed USDHC fall-back code.
This mechanism could lead to the boot configuration written to for instance eMMC if booting a MFGTOOL bootloader with redirection to SD card but without an SD card inserted. This could then lead to unintentional corruption of for instance uboot and/or a Linux kernel in eMMC.
- Fixed bootloader SPI redirection to NAND.
- When booting from SD/MMC, boot port is now automatically determined again (so a bootloader built to boot from SD/MMC works on all USDHC ports).
- Clarified SPI/MFG redirection in the catalog.
- Implemented all clock changes for DualPlus/QuadPlus.
- Added DualPlus/QuadPlus GPR5 definitions.
- Added DualPlus/QuadPlus PRE/PRG IRQs definitions.
- Now opening PRE and PRG gates so that display works again on DualPlus/QuadPlus.
- Now ignoring PRG and PRE gates on Dual/Quad.
- Now also supporting NXP Pins Tool to generate board header files with our internal GenBoardFile tool (we still support IOMUX files too).
- Fixed wrong daisy chain value for FlexCAN on Opal-Q.
- Little improvement in JTAG scripts (not calling Core.Assign for i.MX6 Solo because it fails for solo).
- Fixed issue in ENET code where WEC7 compiler would optimize a call to ENET registers to use a 16 bit access. Now forcing 32 bit access.
- Removed precompiled header from TEST_SMP to prevent build errors when switching RAM size in the catalog.
- Now always building I2C SDK to prevent build errors when no I2C driver is selected in the catalog.
- Now always including i2csdk.dll inside the kernel image, even if no I2C driver is selected. This is needed to prevent errors when loading the display driver.
- Fixed SGT5000 Audio Driver Prefetch Abort when unloading driver.
- Fixed UDP delay issue; major rework of Ethernet and PHY drivers.
- Fixed NDIS data abort when sending 16KB UDP packets with NETIO (netio -u -b 16k <ipaddress>).

- Fixed user stack overflow problem on WEC7 when running `cl_fft`.
- Fixed bug in `config.bib` that would prevent building a SPI bootloader with a NAND kernel.
- SDK version build number now reflects the BSP revision number.
- SDKs now define `BSP_REV` symbol that reflect the BSP revision number (for compile-time determination of BSP revision in application code).
- Added BSP revision definition `BSP_REV` (for compile-time determination of BSP revision in BSP code).
- Added BSP revision information to the registry under `[HKEY_LOCAL_MACHINE\System] "BSP Revision"`.
- Refactored and cleaned up parts of the USB driver code.
- Fixed "Erase Boot Splash" button moving in CEWriter GUI.
- Fixed bug in CEWriter that occurred if the size of the bin file was exactly 512 byte aligned.
- Now cancelling all actions when "No" is clicked in the CEWriter dialog asking if you are sure you want to (re)partition the disk.
- Fixed RTC clock output on TS4900.
- Now enabling 24MHz FPGA clock output on TS4900.
- Updated TS4900-Q DDR3 script.
- Fixed OpenGL XAML render resize rounding problem.
- Fixed OpenGL XAML render plugin color conversion problem (red/blue channel swap).
- Fixed issue with M41T8x RTC; when oscillator failure bit is set you can only reset this flag after starting the oscillator and letting it run for at least 4 seconds.
- Fixed `SCLKPOL/SCLKPHA` bug in ECSPI header; values now match the RM.
- Updated ECSPI driver code to work around TC interrupt silicon bug.
- Fixed boot splash image slant if bitmap width was not dividable by 4.
- Added backlight driver to evaluation kernel OS Design.
- Fixed problem where the GuruCE WEC7 SDK was not listed in Visual Studio when creating a native application.

RELEASE 1100

- Updated Vivante GPU driver to v5.0.11.p8.3
- Multi-monitor functionality now working properly for all resolutions on i.MX6 Solo and DualLite processors
- Boot splash images can now be stored in the system partition (next to the bootloader and kernel images). No need to have a FAT12/16/32 formatted partition anymore
- Background color of boot splash screen now determined by color of bottom right pixel of the boot splash image
- Fixed boot splash slant on non-32-bit aligned resolutions
- Updated CEWriter tool to support flashing boot splash images
- Added support for external drives (like SATA connected through USB) to CEWriter
- Updated documentation to include instructions for flashing boot splash images using CELoader and CEWriter
- Fixed flickering mouse cursor and bad performance when drawing under the mouse cursor.
- Added full support for non-hardware acceleration setting through `BSP_DISPLAY_EMULATION` environment variable
- Removed unused C2D functionality from IPU driver code
- OpenGL XAML render plugin now working properly
- Cloned and fixed bugs in XamlEffects code
- Added catalog option for display without GPU
- Fixed missing GPU headers (OpenGL, OpenVG, etc) in GuruCE iMX6 SDK for Windows Embedded Compact 7
- Clarified procedure in Getting Started Guide for updating the kernel and bootloader images if the GuruCE bootloader is already running on the device
- Added support for external RTCs (Real Time Clock chips). Currently supported (and runtime auto-detected) chips are ISL1208, ISL2020, M41T0, M41T8x and RV4162
- Added catalog option to determine the frequency of the internal oscillator used for the SOC RTC in case no external 32.768 kHz crystal is attached to the RTC_XTAL pins of the i.MX6. Calibration is needed because the internal ring oscillator can range anywhere from 14 to 66 kHz, so the SOC RTC may run way to slow or way to fast if assumptions are made about the frequency of the internal ring oscillator
- Bootloader code now consistent with CE VFP setup
- Added bootshell option for directing clocks to CKO1/2 pads
- Added support for NAND to bootloader and kernel
- Added all source locations for ENET to the catalog item
- Fixed problem in SMP FPV code causing glitches when doing floating point calculations on multiple threads running on multiple cores
- Fixed bug in cloned GPE 'sources' file
- Clarification in config.bib regarding shared video memory
- Removed IMGNOKITL dependency from ConMgr subproject
- Added simple reset application
- Added support for extended (numpad) characters to CLI code.
- Added `SYSGEN_SERVICES` and `SYSGEN_CMD` dependency for CLI component
- Added `SYSGEN_FATFS` dependency for AutoFormat component
- Added some more definitions to IOMux header files
- Added PCIe core reset code so PCIe driver works on DualPlus/QuadPlus

- Worked around quirks of the PCIe module so enumeration works correctly in all cases in multi-core environments
- Changed condition for enabling L2 cache double line fill feature to depend on L2C-310 revision. The i.MX6 Solo/DualLite and DualPlus/QuadPlus now all have r3p2, so for those processors the double line fill feature is now enabled, resulting in much better cache behaviour (and better realtime performance on those processors)
- Fixed and worked around many more bugs and quirks of the ECSPi module. ECSPi driver now working properly at high speeds (tested up to 30 MHz which is the maximum supported ECSPi frequency you can set within limits)
- Fixed problem with setting time zone
- Fixed .NET CF JIT debugger crash when debugging large managed applications
- Fixed multi-cast bug in Ethernet code
- Fixed PHY cable attach/detach status update logic
- Fixed bug in GPT driver code
- Fixed bug in OALStall implementation
- Fixed missing code in GetGpioConfig function of GPIO driver
- Fixed GPIO setting for USER_LEDs in ConnectCore6 board header file
- Fixed bug in CAN transceiver power signal setup on ConnectCore6
- Fixed GPIO USB Host power signal to fix USB issue on Toradex Iris boards
- Improved clocking code to now properly control reference counts of static divider root clocks
- Replaced use of ECSPi enums in board header files (the pre-processor doesn't resolve enums properly)
- Fixed MfgTool USB PID for Opal6-Q boards
- Fixed profile folders in MfgTool cfg.ini for Opal6-DL/Q
- Moved clocking code to more logical place in the BSP tree
- Further cleaned up and refactor of large parts of the interrupt code
- Further clean-up and re-structure of BSP code and tree

RELEASE 954

- Added support for true multi-monitor setups in Windows CE (extended desktop with GDI on both displays)
- Added support for multi-display boot splash screens, with virtually flicker-free transition to CE desktop
- Added support for dynamic selection of multi-display configuration in the bootloader with immediate activation of the selected displays
- Added CEWriter tool; a utility that can write a bootloader and kernel binary directly to a SATA drive or SD card from desktop Windows, and very fast as well!
- Added support for PCIe enumeration over bridges and switches
- Added support for Command Line Interface (cmd.exe) over UART
- Added support for iMX6 Dual Plus and Quad Plus processors
- Added support for VMINI/VBRIDGE network adapter while debugging over KITL
- Added support for very large SATA disks
- Added support for SD/eMMC 8-bit mode
- Added support for eMMC 4.4 DDR mode
- Added support for the Technologic Solutions TS-4900 Solo & Quad board
- Added support for the Device Solutions Opal6 Quad board

- Added support for the Toradex Colibri DualLite board
- Added support for boards with 256MB total memory
- Added support for the N25Q SPI NOR Flash
- Added support for the SMSC 9500 USB network adapter
- Added support for the LAN8720 PHY
- Added support for the KSZ8041 PHY
- Added support for the Freescale/NXP PFO100 PMIC
- Added support for FTDI USB to Serial devices
- Added ability to select the Ethernet interface (MII/RMII/RGMII) in the board header file
- Added ability to set UART type (DCE/DTE) in the board header file
- Added ability to set the default display backlight level in the board header file
- Added “Erase SPI Flash” functionality to the bootshell
- Added IPU Display Settings control panel applet that can be used to set display gamma, rotation and allows dynamic resolution changes
- Added “cleanbsp.cmd” in BSP folder root (this deletes all the build generated files in the BSP)
- Reduced system partition size for kernel and bootloader
- USB disk now called “USBdisk” instead of “Harddisk” (to allow to distinguish between SATA “Harddisk”)
- Performance improvements and thread-safety fixes to SDBus
- Bootloader now disables OTG connection when MfgTool process has finished
- Bootloader TTB setup code now supporting scattered pages inside a section
- Bootloader now omits display selection menu when built for headless device
- Increased allowed bootloader size from 512K to 1MB (to allow flashing of debug bootloaders with code optimization off; for easy JTAG debugging)
- Further optimizations of L2 cache operations to allow better real-time behaviour in the kernel
- L2 cache can now be configured in normal or write-through mode or completely disabled in the bootloader
- Implemented fix for ERR006358 in ENET code
- Added catalog option to disable Gigabit connections for Ethernet (currently this is forced until we find a workaround for the bad performance on Gigabit Ethernet)
- Updated JTAG scripts and improved ‘private’ symbol path resolve script
- Updated Vivante GPU driver to v5.0.p8.0
- Fixed edge-case USDHC data corruption on WEC7
- Fixed bug in L2 cache code
- Fixed bug in timer interrupt handling code
- Fixed bug in VPU code
- Fixed CPU idle count calculation code
- Fixed IPU rotation issue at boot (no more crash when rotation is enabled at boot)
- Fixed disappearing mouse cursor when screen is rotated
- Fixed GPU hang on boards with 2 GB of memory
- Fixed GPU stutter at certain time intervals
- Fixed stack problem in OpenCL tutorials
- Fixed chromatic aberration on iMX6 S/DL HDMI output
- Fixed backlight driver code and Advanced Backlight control panel applet code
- Improved HDMI 1920x1080 timings so that more monitors recognize this resolution
- Improved DDR3 scripts according to latest recommendations from NXP

- Improved Ethernet code
- Improved and consolidated PHY initialization code
- Improved TEMPMON driver code
- Improved UART driver code
- Added SIP (software input panels) to the evaluation kernels
- Added shell.exe to the evaluation kernels so that CE Shell commands can be used by typing “shell -c <command>”
- Added CPUload tool to the evaluation kernels (to show per-CPU load)
- Added Rotate tool to the evaluation kernels (to rotate the screen)
- Further clean-up and re-structure of BSP code and tree

RELEASE 550

- Optimized L2 cache code for real-time behaviour and added catalog items for easy configuration of cache performance options
- Added full support for L1/L2 exclusive cache
- Decoupled cache optimizations from bootloader
- Added performance metric collection code to the L2 cache routines
- Consolidated all low-level cache code into one folder (cleaner BSP structure)
- Optimized some ARM errata implementations
- Added DDK support for easy setting of memory cache attributes
- Added DDK support for easy setting of CKO pin muxing
- Added support for running Qt 5.5 on the evaluation kernels
- Added support for Freescale SDP-SDL and SDP-Q boards
- Added support for Boundary Devices Nitrogen6_VM board
- Added embWise AR6K SDIO evaluation WIFI drivers for WEC7 and WEC2013
- Bootloader now supports selecting LVDS0 or LVDS1 for display output
- Bootloader now turning all configured PWM outputs off (so display backlights are turned off as early as possible in the boot process)
- Changed bootloader factory defaults to use static IP instead of DHCP
- Improved bootloader SPI Flash code
- Added command history support to the bootloader bootshell (use up/down arrows to cycle through historic commands)
- Added DDR performance test to bootloader bootshell cache tests
- Added reset redirect options to the bootloader (allowing, for instance, Linux dual-boot, boot to USB without using the switches, boot to SATA on a device with fuses set to just boot from SPI, etc)
- Added support for parallel RGB LCD pin muxing and control signals
- Added many more register definitions
- More consistent implementation of FIXUPVARS
- All drivers now have their own bib and reg file (cleaner BSP structure)
- Added support for RS485 tight CTS toggling in serial driver code
- Added support for Dr. Watson
- Added support for multi-core debugging
- Added TEMPMON driver
- Added NETIO benchmark code
- Improved the memtool driver, SDK DLL and application
- Cloned and improved FTPD (FTP server) code
- Made all GPU tutorials use the same style parameters
- Added cl_math and cl_loadstore GPU tutorials
- Improved JTAG scripts
- Further improvements to BSP structure, clean code and overall code quality

RELEASE 474

- Increased BSP performance: 4.75 times faster than previous release!
- Added support for HDMI automatic display detection and hot-plug, including resolution changes in CE
- Fixed HDMI purple line
- Added bootloader option for selecting display output (LCD, LVDS or HDMI)
- Added bootloader option to enable or disable L2 cache
- Added support for DMA on all UARTs
- Upgraded to latest Vivante GPU GALCORE driver v5.0.11(25762)
- Added all of the Vivante OpenGL ES 1.1, 2.0, OpenVG and OpenCL tutorial examples
- Now asynchronously loading drivers for faster boot
- Added support for 2 GB option on SABRE-Lite and Nitrogen6X
- Improved JTAG scripts and added some functionality (like multi-core and DLL debugging scripts)
- Some clean-up and restructuring of code and registry files

RELEASE 406

- Added initial support for Boundary Devices Nitrogen6X (still some issues to resolve, see “Known Issues and Limitations” below)
- Fixed USB OTG dependencies in the catalog
- Improved real-time performance of the kernel
- Added option for enabling or disabling the watchdog to the bootloader menu
- Renamed ‘Format’ to ‘Erase’ in the bootloader menu to better describe the functionality
- Added simple memory test to the bootloader bootshell
- Added more information dumps to the bootloader bootshell
- Changed naming of USDHC instances in the bootloader
- Fixed Ethernet problem that occurred on some Sabre Lite boards
- Fixed UART DMA problem
- Fixed ILTiming OAL implementation

RELEASE 363

- Added PCIe support
- Bootloader and CE kernel now print revision information
- Clarified naming of some catalog items
- DISPLAY_ENABLE signal now configurable through board header file
- Backlight PWM now configurable through board header file
- Audio I2C channel now configurable through board header file
- Fixed power manager timeout settings in registry
- Added XML runtime, ATL, Application Builder Debugging Support, Remote Tools Support, Connection Manager Support, OpenGL XAML plugin and VPU driver to demo kernel images
- Added full support for Device Solutions Opal6
- Added full support for Digi ConnectCore6
- Added support for Dialog DA9063 PMIC
- Added support for KSZ9031 Ethernet PHY
- Added support for WSVGA 1024x600 LVDS panels
- Added support for Fusion Touch Controller (F10A-0102)
- Cleaned up ConMgr subprojects
- All UART code now using Device Tree for IO Mux setup

RELEASE 299

- Implemented new ARM erratum #845369 "Under very rare timing circumstances, transitioning into streaming mode might create a data corruption"
- Added sysgen_ethernet in WEC7 OS Design so the network interface component is now visible in the WEC7 kernel
- Slowed down ENET MII interface speed to allow all boards to communicate properly with the Ethernet PHY during PHY configuration
- Now not setting BSP_USDHCn_SD by default in sources.cmn (this fixes wrong display in the bootloader menu [M], [A])

RELEASE 282

- Initial release

KNOWN ISSUES AND LIMITATIONS

Issue ID	Category	Description	Workaround
385	USDHC	On Digi's ConnecCore6 USDHC2 card removal/insertion does not work. Hardware problem: can't fix this in software.	Insert USDHC2 card at start up and don't remove the card.
394	WIFI	No support for WIFI on Boundary Devices Nitrogen6X (no CE WIFI driver available).	None.
423	Audio	No audio driver for the Realtek ALC888 codec on the Conga QKIT-ARM board.	None.
443	Touch	Touch doesn't work correctly in multi-monitor mode.	None.
465	GPU	GPU driver v5.0.15 does not support the new prefetch & resolve functionality in the Dual+/Quad+ processors.	None.
495	GPU	Tearing and loss of HDMI 1920x1080 display timing when running GPU tutorials on NXP SDB-QuadPlus board.	None.
506	Bootloader	Setting CPU frequency to speed grade causes boot problems on TS4900-Q.	Set BSP_BL_NOSPEEDGRADE option in the catalog.
507	Bootloader	Setting CPU frequency to speed grade causes boot problems on ConnectCore6 boards.	Set BSP_BL_NOSPEEDGRADE option in the catalog.
516	Backlight	On Digi's ConnectCore6 backlight control does not work (hardware problem, can't fix this in software)	None.
533	USB	USB OTG in host mode can't work on Colibri due to USB_OTG_ID pin not connected.	Don't use OTG port in host mode, just use USB Host port.
537	Display	On QuadPlus boards, quickly selecting different display resolutions in the bootloader causes the iMX6 to hang.	None.
614	Display	Hardcoded display settings for now on ULL.	None.
619	Audio	Audio not working on MCIMX6ULLEVK (no audio driver for WM8960 codec)	None.
622	USB Host MSC	Detaching and re-attaching a USB mass storage device in very quick succession causes the USB MSC client driver to fall over.	Wait 4 seconds between detach and attach of a USB mass storage device.
643	WIFI	WEC2013 Silverlight WIFI applet doesn't seem to respond to user input, so unable to configure WIFI.	Contact Silex India for an updated WIFI driver.
645	OTG Host	OTG Host functionality not working on Nitrogen6_VM	Don't use OTG port in host mode, just use USB Host port.

GuruCE prioritizes work according to customer requests.

If you find any other bugs or components not working correctly, please send a bug report to bugs@guruce.com using the template on the next page.

Revision: GuruCE iMX6 BSP [rXXX]

Component: [USB/I2C/etc.]

Description of current behaviour:

Description of expected behaviour:

Steps to reproduce:

Additional information:

SUPPORT

GuruCE offers various support options. Please visit <http://guruce.com/support> for more information.

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