
MCUXpresso SDK Release Notes Supporting evkmimxrt685

Change Logs

NXP Semiconductors



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1 Driver Change Log

CLOCK

The current CLOCK driver version is 2.7.2.

- 2.7.2
 - Bug Fixes
 - * Added clock name array for PUF, HashCrypt and Casper.
- 2.7.1
 - Improvements
 - * Added lost comments for some enumerations.
- 2.7.0
 - Bug Fixes
 - * Updated enum sys_pll_mult_t and audio_pll_mult_t to fix the supported MULT values for PLLs.
 - * Supported more APIs for DSP core.
- 2.6.1
 - New feature
 - * Added CLOCK_SetClkinFreq API.
 - Other Changes
 - * Remove main_clk from UTICK, WWDT0/1 clock attach define.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rules.
- 2.6.0
 - API change
 - * Added enableLowPower parameter in CLOCK_EnableSysOscClk().
 - * Added id parameter in CLOCK_GetSdioClkFreq().
 - Other Changes
 - * Fixed C++ build errors.
 - * Added sdio1 and flexcomm6,7 clock support.
 - * Added syspll pfd clock dividers define.
 - * Updated register access per the B0 header file's change.
 - * Added assert in CLOCK_SetFRGClk(), the FRG DIV should be always set to 0xFF according to User Manual.
- 2.5.0
 - New feature
 - * Moved SDK_DelayAtLeastUs function from clock driver to common driver.
- 2.4.1
 - Bug Fixes
 - * Avoided waiting REQFLAG when divider configured to HALT in CLOCK_SetClkDiv().
- 2.4.0
 - Modify Audio PLL mult parameter range.
 - Update get mclk_in api.

- 2.3.0
 - New feature
 - * Adding Deinit PLL&PFD API.
 - API change
 - * Add delay_us parameter in CLOCK_EnableSysOscClk()
- 2.2.0
 - Update I3C and SDIO clock get API.
 - Modify wwdt clock API name.
- 2.1.1
 - Update PLL initialization function.
- 2.1.0
 - New feature
 - * Adding new API CLOCK_DelayAtLeastUs() implemented by DWT to allow users set delay in unit of microsecond.
- 2.0.5
 - Clean up 3 USB clock enable APIs;
- 2.0.4
 - New feature
 - * add get mclk_in api.
 - Bug Fixes
 - * The SysTick clock value should not be divided except choose main clock.
- 2.0.3
 - Update according to UM 0.7.
- 2.0.2
 - some minor fixes.
- 2.0.0
 - initial version.

POWER

The current POWER driver version is 2.3.2.

- 2.3.2
 - Bug Fixes
 - * Fixed MISRA issue in function POWER_GetLibVersion.
- 2.3.1
 - Bug Fixes
 - * Fixed the return value of function countPartitionSwitches.
- 2.3.0
 - API change: POWER_SetLdoVoltageForFreq()
 - * Changed power_part_temp_range_t. 70C->85C.
 - * Added parameter power_volt_op_range_t.
 - * Changed main clock freq parameter to cpu clock freq.
 - * Added return value to indicate success or failure.

- Optimization
 - * Turn on all memory partitions simultaneously on deep sleep wakeup to save time.
- Release in source code instead of in library.
- 2.2.1
 - Exposed POWER_DisableLVD() and POWER_RestoreLVD() APIs in header.
 - Added PMIC_VDDCORE_RECOVERY_TIME_IGNORE macro for POWER_UpdatePmicRecoveryTime() API.
 - Adjusted main frequency table for SetXXXVoltageForFreq() API to match latest B0 data.
- 2.2.0
 - Added parameter to POWER_SetLdoVoltageForFreq to specify part temperature range.
- 2.1.0
 - Updated power library implementation for B0.
 - Added POWER_SetLvdFallingTripVoltage() API.
 - Added POWER_GetLvdFallingTripVoltage() API.
 - Added POWER_UpdatePmicRecoveryTime() API.
- 2.0.3
 - Updated PD_bits per the B0 header file's change.
- 2.0.2
 - Added POWER_SetPadVolRange() API
- 2.0.1
 - Add POWER_UpdateOscSettlingTime() API to set on-board system osc settling time.
- 2.0.0
 - initial version.

RESET

The current RESET driver version is 2.1.3.

- 2.1.3
 - Bug Fixes
 - * Added peripheral reset array for CASPER, PUF, HashCrypt, RNG.
- 2.1.2
 - Bug Fixes
 - * Fixed typo in _RSTCTL_RSTn enumeration's comment.
- 2.1.1
 - Bug Fixes
 - * Fixed MISRA C-2012 rule 10.6 and rule 16.4.
- 2.1.0
 - Updated register access per the B0 header file's change.
- 2.0.4
 - Add SDIO1 and Flexcomm6,7 support.
- 2.0.3
 - Rename RSTCTRL to RSTCTL.
- 2.0.2

- Update according to UM 0.7.
- 2.0.1
 - Update component full_name to "Reset Driver".
- 2.0.0
 - initial version.

DSP

The current DSP driver version is 2.1.1.

- 2.1.1
 - Fixed Misra issue.
- 2.1.0
 - Allowed multiple calls to DSP_Init.
 - Removed DSP clock gate operation.
- 2.0.1
 - Update DSP Init&Deinit function.
- 2.0.0
 - initial version.

ACMP

The current ACMP driver version is 2.0.6.

- 2.0.6
 - Bug Fixes
 - * Fixed the wrong comments, the DAC value should range from 0 to 255.
- 2.0.5
 - Bug Fixes
 - * Fixed the out-of-bounds error of Coverity caused by missing an assert sentence to avoid the return value of ACMP_GetInstance() exceeding the array bounds.
 - * Fixed the violations of MISRA C-2012 rules:
 - Rule 10.1, 14.4, 16.4, 17.7.
- 2.0.4
 - Bug Fixes
 - * Avoided changing w1c bit in ACMP_SetRoundRobinPreState().
- 2.0.3
 - New Features
 - * Added feature functions for usage of different power domains(1.8 V and 3 V). These functions are first enabled in ULP1. They are about:
 - ACMP_EnableLinkToDAC()
 - ACMP_SetDiscreteModeConfig()
 - ACMP_GetDefaultDiscreteModeConfig()
- 2.0.2

- Other Changes
 - * Changed coding style of peripheral base address from "s_acmpBases" to "s_acmpBase".
- 2.0.1
 - Bug Fixes
 - * Fixed bug regarding the function "ACMP_SetRoundRobinConfig". It will not continue execution but returns directly after disabling round robin mode.

CACHE

The current CACHE driver version is 2.0.6.

- 2.0.6
 - Bug Fixes
 - * Fixed overflow for CACHE64_GetInstanceByAddr()/CACHE64_CleanCacheByRange()/CACHE64_InvalidateCacheByRange() APIs.
- 2.0.5
 - Improvement
 - * Made use of FSL_FEATURE_CACHE64_CTRL_HAS_NO_WRITE_BUF feature
- 2.0.4
 - Improvement
 - * Disable cache policy feature on SoC without CACHE64_POLSEL IP.
 - Bug Fixes
 - * Fixed doxygen issue.
- 2.0.3
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.3.
- 2.0.2
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.1, 10.3, 10.4 and 14.4.
 - * Fixed doxygen issue.
- 2.0.1
 - Improvements
 - * Moved CLCR register configuration out of the while loop, it's unnecessary to repeat this operation.
- 2.0.0
 - Initial version.

COMMON

The current COMMON driver version is 2.4.0.

- 2.4.0
 - New Features
 - * Added EnableIRQWithPriority, IRQ_SetPriority, and IRQ_ClearPendingIRQ for ARM.

- * Added MSDK_EnableCpuCycleCounter, MSDK_GetCpuCycleCount for ARM.
- 2.3.3
 - New Features
 - * Added NETC into status group.
- 2.3.2
 - Improvements
 - * Make driver aarch64 compatible
- 2.3.1
 - Bug Fixes
 - * Fixed MAKE_VERSION overflow on 16-bit platforms.
- 2.3.0
 - Improvements
 - * Split the driver to common part and CPU architecture related part.
- 2.2.10
 - Bug Fixes
 - * Fixed the ATOMIC macros build error in cpp files.
- 2.2.9
 - Bug Fixes
 - * Fixed MISRA C-2012 issue, 5.6, 5.8, 8.4, 8.5, 8.6, 10.1, 10.4, 17.7, 21.3.
 - * Fixed SDK_Malloc issue that not allocate memory with required size.
- 2.2.8
 - Improvements
 - * Included stddef.h header file for MDK tool chain.
 - New Features:
 - * Added atomic modification macros.
- 2.2.7
 - Other Change
 - * Added MECC status group definition.
- 2.2.6
 - Other Change
 - * Added more status group definition.
 - Bug Fixes
 - * Undef __VECTOR_TABLE to avoid duplicate definition in cmsis_clang.h
- 2.2.5
 - Bug Fixes
 - * Fixed MISRA C-2012 rule-15.5.
- 2.2.4
 - Bug Fixes
 - * Fixed MISRA C-2012 rule-10.4.
- 2.2.3
 - New Features
 - * Provided better accuracy of SDK_DelayAtLeastUs with DWT, use macro SDK_DELAY_USE_DWT to enable this feature.
 - * Modified the Cortex-M7 delay count divisor based on latest tests on RT series boards, this setting lets result be closer to actual delay time.

- 2.2.2
 - New Features
 - * Added include RTE_Components.h for CMSIS pack RTE.
- 2.2.1
 - Bug Fixes
 - * Fixed violation of MISRA C-2012 Rule 3.1, 10.1, 10.3, 10.4, 11.6, 11.9.
- 2.2.0
 - New Features
 - * Moved SDK_DelayAtLeastUs function from clock driver to common driver.
- 2.1.4
 - New Features
 - * Added OTFAD into status group.
- 2.1.3
 - Bug Fixes
 - * MISRA C-2012 issue fixed.
 - Fixed the rule: rule-10.3.
- 2.1.2
 - Improvements
 - * Add SUPPRESS_FALL_THROUGH_WARNING() macro for the usage of suppressing fallthrough warning.
- 2.1.1
 - Bug Fixes
 - * Deleted and optimized repeated macro.
- 2.1.0
 - New Features
 - * Added IRQ operation for XCC toolchain.
 - * Added group IDs for newly supported drivers.
- 2.0.2
 - Bug Fixes
 - * MISRA C-2012 issue fixed.
 - Fixed the rule: rule-10.4.
- 2.0.1
 - Improvements
 - * Removed the implementation of LPC8XX Enable/DisableDeepSleepIRQ() function.
 - * Added new feature macro switch "FSL_FEATURE_HAS_NO_NONCACHEABLE_SECTION" for specific SoCs which have no noncacheable sections, that helps avoid an unnecessary complex in link file and the startup file.
 - * Updated the align(x) to **attribute**(aligned(x)) to support MDK v6 armclang compiler.
- 2.0.0
 - Initial version.

FLEXSPI

The current FLEXSPI driver version is 2.5.0.

- 2.5.0
 - Improvements
 - * Supported word un-aligned access for write/read blocking/non-blocking API functions.
 - * Fixed dead loop issue in DLL update function when using FRO clock source.
 - * Fixed violations of the MISRA C-2012 Rule 10.3.
- 2.4.0
 - Improvements
 - * Isolated IP command parallel mode and AHB command parallel mode using feature MACRO.
 - * Supported new column address shift feature for external memory.
- 2.3.5
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 14.2.
- 2.3.4
 - Bug Fixes
 - * Updated flexspi_config_t structure and FlexSPI_Init to support new feature FSL_FEATURE_FLEXSPI_HAS_NO_MCR0_COMBINATION.
- 2.3.3
 - Bug Fixes
 - * Removed feature FSL_FEATURE_FLEXSPI_DQS_DELAY_PS for DLL delay setting. Changed to use feature FSL_FEATURE_FLEXSPI_DQS_DELAY_MIN to set slave delay target as 0 for DLL enable and clock frequency higher than 100MHz.
- 2.3.2
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 8.4, 8.5, 10.1, 10.3, 10.4, 11.6 and 14.4.
- 2.3.1
 - Bug Fixes
 - * Wait for bus to be idle before using it as access to external flash with new setting in FLEXSPI_SetFlashConfig() API.
 - * Fixed the potential buffer overread and Tx FIFO overwrite issue in FLEXSPI_WriteBlocking.
- 2.3.0
 - New Features
 - * Added new API FLEXSPI_UpdateDllValue for users to update DLL value after updating flexspi root clock.
 - * Corrected grammatical issues for comments.
 - * Added support for new feature FSL_FEATURE_FLEXSPI_DQS_DELAY_PS in DLL configuration.
- 2.2.2
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.1, 10.3 and 10.4.
 - * Updated _flexspi_command from named enumerator into anonymous enumerator.
- 2.2.1
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.1, 10.3, 10.4, 10.8, 11.9, 14.4, 15.7, 16.4,

- 17.7, 7.3.
 - * Fixed IAR build warning Pe167.
 - * Fixed the potential buffer overwrite and Rx FIFO overread issue in FLEXSPI_Read-Blocking.
- 2.2.0
 - Bug Fixes
 - * Fixed flag name typos: kFLEXSPI_IpTxFifoWatermarkEmptyFlag to kFLEXSPI_IpTxFifoWatermarkEmptyFlag; kFLEXSPI_IpCommandExcutionDoneFlag to kFLEXSPI_IpCommandExecutionDoneFlag.
 - * Fixed comments typos such as sequencen->sequence, levle->level.
 - * Fixed FLSHCR2[ARDSEQID] field clean issue.
 - * Updated flexspi_config_t structure and FlexSPI_Init to support new feature FSL_FEATURE_FLEXSPI_HAS_NO_MCR0_ATDFEN and FSL_FEATURE_FLEXSPI_HAS_NO_MCR0_ARDFEN.
 - * Updated flexspi_flags_t structure to support new feature FSL_FEATURE_FLEXSPI_HAS_INTEN_AHBUSEREROREN.
- 2.1.1
 - Improvements
 - * Defaulted enable prefetch for AHB RX buffer configuration in FLEXSPI_GetDefaultConfig, which is align with the reset value in AHB RX BUFxCR0.
 - * Added software workaround for ERR011377 in FLEXSPI_SetFlashConfig; added some delay after DLL lock status set to ensure correct data read/write.
- 2.1.0
 - New Features
 - * Added new API FLEXSPI_UpdateRxSampleClock for users to update read sample clock source after initialization.
 - * Added reset peripheral operation in FLEXSPI_Init if required.
- 2.0.5
 - Bug Fixes
 - * Fixed FLEXSPI_UpdateLUT cannot do partial update issue.
- 2.0.4
 - Bug Fixes
 - * Reset flash size to zero for all ports in FLEXSPI_Init; fixed the possible out-of-range flash access with no error reported.
- 2.0.3
 - Bug Fixes
 - * Fixed AHB receive buffer size configuration issue. The FLEXSPI_AHBRXBUFCR0_BUFSZ field should configure 64 bits size, and currently the AHB receive buffer size is in bytes which means 8-bit, so the correct configuration should be config->ahbConfig->buffer[i].bufferSize / 8.
- 2.0.2
 - New Features
 - * Supported DQS write mask enable/disable feature during set FLEXSPI configuration.
 - * Provided new API FLEXSPI_TransferUpdateSizeEDMA for users to update eDMA transfer size(SSIZE/DSIZE) per DMA transfer.

- Bug Fixes
 - * Fixed invalid operation of FLEXSPI_Init to enable AHB bus Read Access to IP RX FIFO.
 - * Fixed incorrect operation of FLEXSPI_Init to configure IP TX FIFO watermark.
- 2.0.1
 - Bug Fixes
 - * Fixed the flag clear issue and AHB read Command index configuration issue in FLEXSPI_SetFlashConfig.
 - * Updated FLEXSPI_UpdateLUT function to update LUT table from any index instead of previous command index.
 - * Added bus idle wait in FLEXSPI_SetFlashConfig and FLEXSPI_UpdateLUT to ensure bus is idle before any change to FlexSPI controller.
 - * Updated interrupt API FLEXSPI_TransferNonBlocking and interrupt handle flow FLEXSPI_TransferHandleIRQ.
 - * Updated eDMA API FLEXSPI_TransferEDMA.
- 2.0.0
 - Initial version.

FLEXSPI DMA Driver

- 2.2.1
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.1, 10.3, 10.4, 10.8.
- 2.2.0
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 Rule 10.1, 10.3.
 - New Features
 - * Updated name of FLEXSPI_TransferGetTransferCountDMA API.
- 2.1.1
 - New Features
 - * Updated driver to support feature FSL_FEATURE_FLEXSPI_DMA_MULTIPLE_DES.
- 2.1.0
 - Bug Fixes
 - * Updated enumeration flexspi_dma_transfer_nsize_t and remove the unsupported items.
 - New Features
 - * Updated driver for deprecating the multiple linked descriptors inside FLEXSPI_TransferDMA, only up to one linked descriptor is needed according to hardware update.
- 2.0.0
 - Initial version.

LPADC

The current LPADC driver version is 2.6.1.

- 2.6.1
 - Improvements
 - * Updated the use of macros in the driver code.
- 2.6.0
 - Improvements
 - * Added the API LPADC_SetOffset12BitValue() to configure 12bit ADC conversion offset trim value manually.
 - * Added the API LPADC_SetOffset16BitValue() to configure 16bit ADC conversion offset trim value manually.
 - * Added API to set offset calibration mode.
 - * Added configuration of alternate channel.
 - * Updated auto calibration API and added calibration value conversion API.
 - New feature
 - * Added API LPADC_EnableHardwareTriggerCommandSelection() to enable trigger commands controlled by ADC_ETC.
- 2.5.1
 - Bug Fixes
 - * Fixed some typos in Lpadc driver comments.
- 2.5.0
 - Improvements
 - * Added missing items to enable trigger interrupts.
- 2.4.0
 - New features
 - * Added APIs to get/clear trigger status flags.
- 2.3.0
 - Improvements
 - * Removed LPADC_MeasureTemperature() function for the LPADC supports different temperature sensor calculation equations.
- 2.2.1
 - Improvements
 - * Optimized LPADC_MeasureTemperature() function to support the specific series with flash solidified calibration value.
 - * Clean doxygen warnings.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 10.3, rule 10.8 and rule 17.7.
- 2.2.0
 - New Feature
 - * Added API LPADC_MeasureTemperature() to get correct temperature from the internal sensor.
 - Improvements
 - * Separated lpadc_conversion_resolution_mode_t with related feature macro.
 - Bug Fixes
 - * Fixed the violations of MISRA C-2012 rules:
 - Rule 10.3, 10.4, 10.6, 10.7 and 17.7.
- 2.1.1

- Improvements
 - * Updated the gain calibration formula.
 - * Used feature to segregate the new item kLPADC_TriggerPriorityPreemptSubsequently.
- 2.1.0
 - New Features
 - * Added the API LPADC_SetOffsetValue() to support configure offset trim value manually.
 - * Added the API LPADC_DoOffsetCalibration() to do offset calibration independently.
 - Improvements
 - * Improved the usage of macros and removed invalid macros.
- 2.0.2
 - Improvements
 - * Added support for platforms with 2 FIFOs and different calibration measures.
- 2.0.1
 - Bug Fixes
 - * Ensured the API LPADC_SetConvCommandConfig configure related registers correctly.
- 2.0.0
 - Initial version.

MU

The Current MU driver version is 2.1.1.

- 2.1.1
 - Bug Fixes
 - * Fixed general interrupt comment typo.
- 2.1.0
 - Improvements
 - * Added new enum mu_msg_reg_index_t.
- 2.0.7
 - Bug Fixes
 - * Fixed MU_GetInterruptsPending bug that can not get general interrupt status.
- 2.0.6
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 rules 17.7.
- 2.0.5
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 rules 14.4, 15.5.
- 2.0.4
 - Improvements
 - * Improved for the platforms which don't support reset assert interrupt and get the other core power mode.
- 2.0.3
 - Bug fixes
 - * MISRA C-2012 issue fixed.

- Fixed rules, containing: rule-10.3, rule-14.4, rule-15.5.
- 2.0.2
 - Improvements
 - * Added support for MIMX8MQx.
- 2.0.1
 - Improvements
 - * Added support for MCIMX7Ux_M4.
- 2.0.0
 - Initial version.

SEMA42

The current SEMA42 driver version is 2.0.3.

- 2.0.3
 - Improvements
 - * Changed to implement SEMA42_Lock base on SEMA42_TryLock.
- 2.0.2
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 rules 17.7.
- 2.0.1
 - Bug Fixes
 - * Fixed violations of the MISRA C-2012 rules 10.3, 10.4, 14.4, 18.1.
- 2.0.0
 - Initial version.

USDHC

The current USDHC driver version is 2.8.2.

- 2.8.2
 - Improvements
 - * Added feature macro FSL_FEATURE_USDHC_HAS_NO_VOLTAGE_SELECT.
- 2.8.1
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9.
- 2.8.0
 - Improvements
 - * Fixed the mmc boot transfer failed issue which is caused by the Dma complete interrupt not enabled.
 - * Marked api USDHC_AdjustDelayForManualTuning as deprecated and added new api USDHC_SetTuingDelay/USDHC_GetTuningDelayStatus.
 - * Improved the manual tuning flow accroding to specification.
 - * Added memory address conversion to support buffers which could only be accessed using

- alias address by non-core masters.
- * Fixed violations of MISRA C-2012 rule 10.4.
- 2.7.0
 - Improvements
 - * Added api USDHC_TransferScatterGatherADMANonBlocking to support scatter gather transfer.
 - * Added feature FSL_FEATURE_USDHC_REGISTER_HOST_CTRL_CAP_HAS_NO_RETUNING_TIME_COUNTER for re-tuning time counter field in HOST_CTRL_CAP register.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 10.1, 10.3, 10.4, 8.4.
- 2.6.0
 - Improvements
 - * Added api USDHC_SetStandardTuningCounter to support adjust tuning counter of Standard tuning.
- 2.5.1
 - Improvements
 - * Used different status code for command and data interrupt callback.
 - * Added cache line invalidate for receive buffer in driver IRQ handler to fix CM7 speculative access issue.
- 2.5.0
 - Improvements
 - * Added new api USDHC_SetStrobeDllOverride for HS400 strobe dll override mode delay taps configurations.
 - * Corrected the STROBE DLL configurations sequence.
- 2.4.0
 - Improvements
 - * Added feature macro for read/write burst length.
 - Disabled redundant interrupt per different transfer request.
 - Disabled interrupt and reset command/data pointer in handle when transfer completes.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 15.7, 4.7, 16.4, 10.1, 10.3, 10.4, 11.3, 14.4, 10.6, 17.7, 16.1, 16.3.
 - * Fixed PA082 build warning.
 - * Fixed logically dead code Coverity issue.
- 2.3.0
 - Improvements
 - * Added USDHC_SetDataConfig API to support manual tuning.
 - * Removed the limitaion that source clock must be bigger than the target in function USDHC_SetSdClock by using source clock frequency as target directly.
 - * Added peripheral reset in USDHC_Init function.
 - * Added tuning reset support in function USDHC_Reset function.
- 2.2.8
 - Bug Fixes
 - * Fixed out-of bounds write in function USDHC_ReceiveCommandResponse.

- 2.2.7
 - Improvements
 - * Added API `USDHC_GetEnabledInterruptStatusFlags` and used in `USDHC_Transfer_HandleIRQ`.
 - * Removed useless member `interruptFlags` in `usdhc_handle_t`.
- 2.2.6
 - Improvements
 - * Added address align check for ADMA descriptor table address.
 - * Changed `USDHC_ADMA1_DESCRIPTOR_MAX_LENGTH_PER_ENTRY` to (65536-4096) to make sure the data address is 4KB align for a transfer which need more than one ADMA1 descriptor.
- 2.2.5
 - Bug Fixes
 - * Fixed MDK 66-D warning.
- 2.2.4
 - Bug Fixes
 - * Fixed issue that real clock frequency was mismatched with target clock frequency, which was caused by an incorrect prescaler calculation.
 - New Features
 - * Added control macro to enable/disable the `CLOCK` code in current driver.
- 2.2.3
 - Bug Fixes
 - * Fixed issue where AMDA did not disable with `DMAEN` clear.
 - Improvements
 - * Improved set clock function to check the output frequency range.
 - * Dynamic set `SDCLKFS` during DDR enable or disable.
- 2.2.2
 - Improvements
 - * Improved read transfer cache maintain operation, combined clean, and invalidated them into one function.
- 2.2.1
 - Bug Fixes
 - * Disabled the invalidate cache operation for tuning.
- 2.2.0
 - Improvements
 - * Improved USDHC to support MMC boot feature.
- 2.1.3
 - Bug Fixes
 - * Fixed MISRA issue.
- 2.1.2
 - Bug Fixes
 - * Fixed Coverity issue.
 - * Added base address and `userData` parameter for all callback functions.
- 2.1.1
 - Improvements

- * Added cache maintain operation.
- * Added timeout status check for the DATA transfer which ignore error.
- * Added feature macro for SDR50/SDR104 mode.
- * Removed useless IRQ handler from different platforms.
- 2.1.0
 - Improvements
 - * Integrated tuning into transfer function.
 - * Added strobe DLL feature.
 - * Added enableAutoCommand23 in data structure.
 - * Removed enable card clock function because the controller would handle the clock on/off.
- 2.0.0
 - Initial version.

2 Middleware Change Log

DSP Audio Streamer

The current version of DSP Audio Streamer is 2.6p2.

- 2.6p2
 - Update to version 2.6p2 (2.6 patch)
- 2.6p1
 - Update to version 2.6p1 (2.6 patch release 1)
- 2.6
 - Update to version 2.6 GA
- 2.0
 - Initial version of DSP Audio Streamer

NatureDSP

The current version of NatureDSP is 4.1.0.

- 4.1.0
 - Updated to 4.1.0 version of NatureDSP from Cadence for HiFi4 DSP. Library built with nxp-rt600_RI2021_8_newlib build configuration.
- 4.0.0
 - Initial version of NatureDSP from Cadence for HiFi4 DSP.

emWin library

The currently supported version is 6.28

- v6.28
 - upgraded to v6.28
- v6.24_rev2
 - add cm33_nodsp libraries for Cortex M33 without DSP extension
- v6.24_rev1
 - recompiled cm33 library with fpu single precision
 - added cm7_sp library for Cortex M7 with sp fpu for IAR
- v6.24
 - upgraded to v6.24
- v6.16c
 - upgraded to v6.16c
 - updated temperature_control demo generated by AppWizard
- v6.14d
 - upgraded to v6.14d

- v6.10f
 - upgraded to v6.10f

FatFs for MCUXpresso SDK

Current version is FatFs R0.14b_rev0.

- R0.14b_rev1
 - Applied patches from <http://elm-chan.org/fsw/ff/patches.html>
- R0.14b_rev0
 - Upgraded to version 0.14b
- R0.14a_rev0
 - Upgraded to version 0.14a
 - Applied patch ff14a_p1.diff and ff14a_p2.diff
- R0.14_rev0
 - Upgraded to version 0.14
 - Applied patch ff14_p1.diff and ff14_p2.diff
- R0.13c_rev0
 - Upgraded to version 0.13c
 - Applied patches ff_13c_p1.diff, ff_13c_p2.diff, ff_13c_p3.diff and ff_13c_p4.diff.
- R0.13b_rev0
 - Upgraded to version 0.13b
- R0.13a_rev0
 - Upgraded to version 0.13a. Added patch ff_13a_p1.diff.
- R0.12c_rev1
 - Add NAND disk support.
- R0.12c_rev0
 - Upgraded to version 0.12c and applied patches ff_12c_p1.diff and ff_12c_p2.diff.
- R0.12b_rev0
 - Upgraded to version 0.12b.
- R0.11a
 - Added glue functions for low-level drivers (SDHC, SDSPI, RAM, MMC). Modified diskio.c.
 - Added RTOS wrappers to make FatFs thread safe. Modified syscall.c.
 - Renamed ffconf.h to ffconf_template.h. Each application should contain its own ffconf.h.
 - Included ffconf.h into diskio.c to enable the selection of physical disk from ffconf.h by macro definition.
 - Conditional compilation of physical disk interfaces in diskio.c.

lwIP for MCUXpresso SDK

Lightweight IP (lwIP) is a small independent implementation of the TCP/IP protocol suite. Source code included in this SDK is based on development version 2.2.0.dev taken from 3rd party lwIP GIT repository. The webpage <https://git.savannah.nongnu.org/cgit/lwip.git> allows to browse the

repository and also contains URLs for its cloning. The development versions (X.Y.Z.dev) do not refer to a single source code snapshots. To avoid ambiguity, change log below contains SHA-1 hashes of GIT commits used when importing the code into the SDK.

- 2.2.0_rev7

- New features:

- * Ported lwIP 2.2.0.dev (2022-05-09, branch: master, SHA-1: 239918ccc173cb2c2a62f41a40fd893f571) to MCUXpresso SDK.
- * Added function ethernetif_probe_link() which reads actual link, speed and duplex settings from phy and passes them to driver. Stack could be set to call this function periodically by setting ETH_LINK_POLLING_INTERVAL_MS to value higher than zero.
- * Added helper functions ethernetif_wait_linkup() and ethernetif_wait_ipv4_valid() to allow blocking of RTOS task or bare metal application until link is up or IPv4 address becomes valid.
- * Added NETC adaptation layer.
- * Processing of rx packets under RTOS moved from ISR to a separate task to improve system reaction times. Switch back to old behavior can be done by setting ETH_DO_RX_IN_SEPARATE_TASK macro to 0.

- Bug fixes:

- * port: Fixed copying of pbuf contents. Previous code was using an incorrect end condition and could result in the overrun of the destination buffer if more packets were on the queue.
- * port: Delegating pbuf_free calls to tcpip_thread via pbuf_free_callback where possible (RTOS), ensured pbuf_free is not called from interrupt context when LWIP_ALLOW_MEM_FREE_FROM_OTHER_CONTEXT is not set (bare metal).
- * port/enet_ethernetif_qos.c - Fixed ENET_RXBD_NUM which was used instead of ENET_TXBD_NUM.
- * port/enet_ethernetif_qos.c - Fixed buffer alignment to be at least 64.
- * src/apps/lwiperf: Fixed IPv6 TCP TX throughput lower than IPv4 by modifying maximum segment size to avoid sending two segments instead of one.
- * src/apps/lwiperf: Out-of-order datagrams in UDP RX server mode are counted to the throughput.
- * src/apps/httpsrv: Implemented receive timeouts on sockets.
- * src/apps/httpsrv: Don't assert on HTTP session task creation failure.
- * src/apps/httpsrv: Fixed build with IPv6 enabled.
- * src/apps/httpsrv: Updated endianness macros required for websocket SHA generation.
- * src/apps/httpsrv: Added missing includes.

- 2.2.0_rev6

- New features:

- * Ported lwIP 2.2.0.dev (2022-03-25, branch: master, SHA-1: 124dc0a64ef5d7c14a27e3115e5888df65) to MCUXpresso SDK.
- * Implemented leaving of multicast groups on ENET and ENET QOS.

- 2.2.0_rev5

- New features:

- * Ported lwIP 2.2.0.dev (2021-05-11, branch: master, SHA-1: 7ec4e9be304e7f8953740f10b2c810a292) to MCUXpresso SDK.

- * LPC ENET adaptation layer allocates more buffers for frame reception now. Previously the number of receive buffers was determined by ENET_RXBD_NUM, which defaults to 5. It is determined by ENET_RXBUFF_NUM now, which is 2 * ENET_RXBD_NUM by default. Increase was needed because the actual version of LPC ENET driver always hold ENET_RXBD_NUM number of buffers and few additional buffers are needed for passing zero-copy frame data to lwIP. If this takes too much memory in your application, you can counteract by decreasing PBUF_POOL_SIZE, since PBUF_POOL is used only for transmission when LPC ENET, Kinetis ENET or ENET QOS is used.
- 2.2.0_rev4
 - New features:
 - * Ported lwIP 2.2.0.dev (2021-03-05, branch: master, SHA-1: 0056522cc974d2be2005c324f37187b5b2) to KSDK 2.0.0.
 - * LWIP_DHCP_DOES_ACD_CHECK option default changed to 0 (disabled):
 - Although the ACD check makes getting IP address from DHCP more robust, it added several seconds delay at startup of all applications which use DHCP.
 - This feature was not present in earlier versions of lwIP.
 - * ENET QOS adaptation layer - implemented zero-copy on receive.
 - * Kinetis ENET and ENET QOS adaptation layers allocate more buffers for frame reception now. Previously the number of receive buffers was determined by ENET_RXBD_NUM, which defaults to 5. It is determined by ENET_RXBUFF_NUM now, which is 2 * ENET_RXBD_NUM by default. Increase was needed because the actual version of Kinetis ENET and ENET QOS drivers always hold ENET_RXBD_NUM number of buffers and few additional buffers are needed for passing zero-copy frame data to lwIP. If this takes too much memory in your application, you can counteract by decreasing PBUF_POOL_SIZE, since PBUF_POOL is used only for transmission when Kinetis ENET or ENET QOS is used.
 - * Removed ethernetif_config_t.non_dma_memory field which was required to configure memory ranges unusable by ENET DMA on LPC devices. The setting has been replaced by BOARD_ENET_NON_DMA_MEMORY_ARRAY macro.
- 2.2.0_rev3
 - New features:
 - * Ported lwIP 2.2.0.dev (2020-07-07, branch: master, SHA-1: c385f31076b27efb8ee37f00cb5568783a) to KSDK 2.0.0.
- 2.2.0_rev2
 - New features:
 - * Kinetis ENET adaptation layer - implemented zero-copy on receive.
 - * lwiperf - counter of transferred bytes extended from 32 to 64 bit
 - Bug fixes:
 - * Fixed restarting Auto IP from DHCP.
- 2.2.0_rev1
 - New features:
 - * Ported lwIP 2.2.0.dev (2019-12-12, branch: master, SHA-1: 555812dcec38c9a2ef1ef9b31816291549) to KSDK 2.0.0.
 - * Implemented LWIP_ASSERT_CORE_LOCKED related functions in sys_arch.c. It can be enabled in lwipopts.h:

- `#define LWIP_ASSERT_CORE_LOCKED() sys_check_core_locking()`
 - `#define LWIP_MARK_TCPIP_THREAD() sys_mark_tcpip_thread()`
`// if NO_SYS == 0`
 - `#define LOCK_TCPIP_CORE() sys_lock_tcpip_core() // if NO_SYS == 0 and LWIP_TCPIP_CORE_LOCKING == 1`
 - `#define UNLOCK_TCPIP_CORE() sys_unlock_tcpip_core() // if NO_SYS == 0 and LWIP_TCPIP_CORE_LOCKING == 1`
- 2.1.2_rev5
 - New features:
 - * Implemented TCP_USER_TIMEOUT socket option.
 - * Implemented SIOCOUTQ ioctl.
- 2.1.2_rev4
 - New features:
 - * Ported lwIP 2.1.3.dev (2019-02-27, branch: STABLE-2_1_x, SHA-1: 1bb6e7f52de1cd86be0eed31e3) to KSDK 2.0.0.
 - * Updated sys_thread_new implementation and comment.
 - * Kinetis ENET adaptation layer - reading frames into a pbuf chain is conditionally compiled only when a single pbuf from pool cannot hold maximum frame size (PBUF_POOL_BUFSIZE >= maximum frame size). Avoiding this code also reduces stack size requirements by about 1.5 kilobytes.
 - Bug fixes:
 - * Fixes in ethernetif_linkoutput() in enet_ethernetif_lpc.c:
 - Removed access to possibly freed pbuf.
 - Call pbuf_free() when transmit buffers not available.
 - When copying pbuf chain, updating the number of necessary transmit buffers to wait for, which can be often smaller in the copy.
 - * When CGI script is reading POST data by chunks, the loop in httpsrv_read() may cause blocking in receive function waiting for more data at the end of the stream
 - HTTPSrv_cgi_read() - added limiting of the last chunk length according to content length to avoid undesired blocking
 - * Applied AUTOIP patch <https://savannah.nongnu.org/patch/?9847> - with modification to support multiple network interfaces.
 - * Fixed buffer overflow in httpsrv when application provided CGI script does not handle the whole content of POST request
 - Removed LwipMibCompiler contrib application as it contained LGPL licensed files in Sharp-SnmpLib.
- 2.1.2_rev3
 - New features:
 - * lwiperf updated with UDP client/server support from the patch 9751 (<https://savannah.nongnu.org/patch/?9751>)
- 2.1.2_rev2
 - Bug fixes:
 - * Fixed lwiperf_abort() in lwiperf.c to correctly close connections and free resources
- 2.1.2_rev1
 - New features:

- * Ported lwIP 2.1.2 (2018-11-22, SHA-1: 159e31b689577dbf69cf0683bbaffbd71fa5ee10) to KSDK 2.0.0.
- * Ported lwIP-contrib 2.1.0 (2018-09-24, SHA-1: 35b011d4cf4c4b480f8859c456587a884ec9d287) to KSDK 2.0.0.
- 2.0.3_rev1
 - New features:
 - * Ported lwIP 2.0.3 (2017-09-15, SHA-1: 92f23d6ca0971a32f2085b9480e738d34174417b) to KSDK 2.0.0.
- 2.0.2_rev1
 - New features:
 - * Ported lwIP 2.0.2 (2017-03-13, SHA-1: c0862d60746e2d1ceae69af4c6f24e469570ecef) to KSDK 2.0.0.
- 2.0.0_rev3
 - New features:
 - * Ported lwIP 2.0.0 (2016-11-10, SHA-1: 216bf89491815029aa15463a18744afa04df58fe) to KSDK 2.0.0.
- 2.0.0_rev2
 - New features:
 - * Ported lwIP 2.0.0 RC2 (2016-08-08, SHA-1: b1dfd00f9233d124514a36a8c8606990016f2ad4) to KSDK 2.0.0.
- 2.0.0_rev1
 - New features:
 - * Ported lwIP 2.0.0 RC0 (2016-05-26) to KSDK 2.0.0.
 - * Changed lwIP bare-metal examples to use poll-driven approach instead of interrupt-driven one.
- 1.4.1_rev2
 - New features:
 - * Enabled critical sections in lwIP.
 - Bug fixes:
 - * Fixed default lwIP packet-buffer size to be able to accept a maximum size frame from the ENET driver.
 - * Fixed possible drop of multi-frame packets during transmission.
- 1.4.1_rev1
 - New features:
 - * Ported lwIP 1.4.1 to KSDK 2.0.0.

Multicore SDK

The current version of Multicore SDK is 2.13.0

- 2.13.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.10.0
 - * eRPC generator (erpcgen) v.1.10.0

- * Multicore Manager (MCMgr) v4.1.3
- * RPMsg-Lite v5.0.0
- New features:
 - * eRPC: MUTransport adaptation to new supported SoCs.
 - * eRPC: Simplifying CI with installing dependencies using shell script, GitHub PR #267.
 - * eRPC: Using event for waiting for sock connection in TCP python server, formatting python code, C specific includes, GitHub PR #269.
 - * eRPC: Endianness agnostic update, GitHub PR #276.
 - * eRPC: Assertion added for functions which are returning status on freeing memory, GitHub PR #277.
 - * eRPC: Fixed closing arbitrator server in unit tests, GitHub PR #293.
 - * eRPC: Makefile updated to reflect the correct header names, GitHub PR #295.
 - * eRPC: Compare value length to used length() in reading data from message buffer, GitHub PR #297.
 - * eRPC: Add TCP_NODELAY option to python, GitHub PR #298.
 - * eRPC: Replace EXPECT_TRUE with EXPECT_EQ in unit tests, GitHub PR #318.
 - * eRPC: Adapt rpmsg_lite based transports to changed rpmsg_lite_wait_for_link_up() API parameters.
 - * eRPC, erpcgen: Better distinguish which file can and cannot be linked by C linker, GitHub PR #266.
 - * eRPC, erpcgen: Stop checking if pointer is NULL before sending it to the erpc_free function, GitHub PR #275.
 - * eRPC, erpcgen: Changed api to count with more interfaces, GitHub PR #304.
 - * erpcgen: Check before reading from heap the buffer boundaries, GitHub PR #287.
 - * erpcgen: Several fixes for tests and CI, GitHub PR #289.
 - * erpcgen: Refactoring erpcgen code, GitHub PR #302.
 - * erpcgen: Fixed assigning const value to enum, GitHub PR #309.
 - * erpcgen: Enable runTesttest_enumErrorCode_allDirection, serialize enums as int32 instead of uint32.
 - * MCMgr: mcmgr_mu_internal.c code adaptation to new supported SoCs.
 - * RPMsg-Lite: Improved debug check buffers implementation - instead of checking the pointer fits into shared memory check the presence in the VirtIO ring descriptors list.
 - * RPMsg-Lite: Timeout parameter added to rpmsg_lite_wait_for_link_up API function.
 - * RPMsg-Lite: VRING_SIZE is set based on number of used buffers now (as calculated in vring_init) - updated for all platforms that are not communicating to Linux rpmsg counterpart.
 - * RPMsg-Lite: Fixed wrong RL_VRING_OVERHEAD macro comment in platform.h files.
 - * RPMsg-Lite: Misra corrections.
- 2.12.0_imx93
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.9.1
 - * eRPC generator (erpcgen) v.1.9.1
 - * Multicore Manager (MCMgr) v4.1.2
 - * RPMsg-Lite v4.0.1
 - New features:

- * RMPMsg-Lite: Added porting layers for i.mx93 device.
- 2.12.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.9.1
 - * eRPC generator (erpcgen) v.1.9.1
 - * Multicore Manager (MCMgr) v4.1.2
 - * RMPMsg-Lite v4.0.0
 - New features:
 - * eRPC: Construct the USB CDC transport, rather than a client, GitHub PR #220.
 - * eRPC: Fix premature import of package, causing failure when attempting installation of Python library in a clean environment, GitHub PR #38, #226.
 - * eRPC: Improve python detection in make, GitHub PR #225.
 - * eRPC: Fix several warnings with deprecated call in pytest, GitHub PR #227.
 - * eRPC: Fix freeing union members when only default need be freed, GitHub PR #228.
 - * eRPC: Fix making test under Linux, GitHub PR #229.
 - * eRPC: Assert costumizing, GitHub PR #148.
 - * eRPC: Fix corrupt clientList bug in TransportArbitrator, GitHub PR #199.
 - * eRPC: Fix build issue when invoking g++ with -Wno-error=free-nonheap-object, GitHub PR #233.
 - * eRPC: Fix inout cases, GitHub PR #237.
 - * eRPC: Remove ERPC_PRE_POST_ACTION dependency on return type, GitHub PR #238.
 - * eRPC: Adding NULL to ptr when codec function failed, fixing memcpy when fail is present during deserialization, GitHub PR #253.
 - * eRPC: MessageBuffer usage improvement, GitHub PR #258.
 - * eRPC: Get rid for serial and enum34 dependency (enum34 is in python3 since 3.4 (from 2014)), GitHub PR #247.
 - * eRPC: Several MISRA violations addressed.
 - * eRPC: Fix timeout for Freertos semaphore, GitHub PR #251.
 - * eRPC: Use of rpmsg_lite_wait_for_link_up() in rpmsg_lite based transports, GitHub PR #223.
 - * eRPC: Fix codec nullptr dereferencing, GitHub PR #264.
 - * erpcgen: Fix two syntax errors in erpcgen Python output related to non-encapsulated unions, improved test for union, GitHub PR #206, #224.
 - * erpcgen: Fix serialization of list/binary types, GitHub PR #240.
 - * erpcgen: Fix empty list parsing, GitHub PR #72.
 - * erpcgen: Fix templates for malloc errors, GitHub PR #110.
 - * erpcgen: Get rid of encapsulated union declarations in global scale, improve enum usage in unions, GitHub PR #249, #250.
 - * erpcgen: Fix compile error:UniqueIdChecker.cpp:156:104:'sort' was not declared, GitHub PR #265.
 - * MCMgr: Update mcmgr_stop_core_internal() implementations to set core state to kMC-MGR_ResetCoreState.
 - * RMPMsg-Lite: Introduce new rpmsg_lite_wait_for_link_up() API function - this allows to avoid using busy loops in rtos environments, GitHub PR #21.

- * RPMsg-Lite: Adjust `rpmsg_lite_is_link_up()` to return `RL_TRUE/RL_FALSE`.
- 2.11.1
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.9.0
 - * eRPC generator (erpcgen) v.1.9.0
 - * Multicore Manager (MCMgr) v4.1.1
 - * RPMsg-Lite v3.2.1
 - New features:
 - * RPMsg-Lite: Add support for custom shared memory arrangement per the RPMsg_Lite instance.
- 2.11.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.9.0
 - * eRPC generator (erpcgen) v.1.9.0
 - * Multicore Manager (MCMgr) v4.1.1
 - * RPMsg-Lite v3.2.0
 - New features:
 - * eRPC: Improving template usage, GitHub PR #153.
 - * eRPC: `run_clang_format.py` cleanup, GitHub PR #177.
 - * eRPC: Build TCP transport setup code into `liberpc`, GitHub PR #179.
 - * eRPC: Fix multiple definitions of `g_client` error, GitHub PR #180.
 - * eRPC: Fix `memset` past end of buffer in `erpc_setup_mbf_static.cpp`, GitHub PR #184.
 - * eRPC: Fix deprecated error with newer `pytest` version, GitHub PR #203.
 - * eRPC: Allow used `LIBUSBIO` device index being specified from the Python command line argument.
 - * eRPC, `erpcgen`: Static allocation support and usage of `rpmsg` static FreeRTOSs related APi, GitHub PR #168, #169.
 - * `erpcgen`: Remove redundant module imports in `erpcgen`, GitHub PR #196.
 - * RPMsg-Lite: Improve static allocations - allow OS-specific objects being allocated statically, GitHub PR #14.
 - * RPMsg-Lite: Minor Misra and typo corrections, GitHub PR #19, #20.
- 2.10.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.8.1
 - * eRPC generator (erpcgen) v.1.8.1
 - * Multicore Manager (MCMgr) v4.1.1
 - * RPMsg-Lite v3.1.2
 - New features:
 - * eRPC: Fix misra `erpc c`, GitHub PR #158.
 - * eRPC: Allow conditional compilation of `message_loggers` and `pre_post_action`.
 - * eRPC: New `i2c_slave_transport` transport introduced.
 - * eRPC: (D)SPI slave transports updated to avoid busy loops in rtos environments.
 - * `erpcgen`: Re-implement `EnumMember::hasValue()`, GitHub PR #159.
 - * `erpcgen`: Fixing several misra issues in shim code, `erpcgen` and unit tests updated, GitHub PR #156.

- * erpcgen: Fix bison file, GitHub PR #156.
 - * RPMsg-Lite: Fixed incorrect description of the `rpmsg_lite_get_endpoint_from_addr` function.
 - * RPMsg-Lite: Updated `RL_BUFFER_COUNT` documentation.
 - * RPMsg-Lite: `env_print` macro adjusted to address MISRA 21.6 rule in MCUXpressoSDK projects.
- 2.9.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.8.0
 - * eRPC generator (erpcgen) v.1.8.0
 - * Multicore Manager (MCMgr) v4.1.1
 - * RPMsg-Lite v3.1.1
 - New features:
 - * eRPC: Support win32 thread, GitHub PR #108.
 - * eRPC: Add mbed support for `malloc()` and `free()`, GitHub PR #92.
 - * eRPC: Update makefile.
 - * eRPC: Fixed warnings and error with using MessageLoggers, GitHub PR #127.
 - * eRPC: Extend error msg for python server service handle function, GitHub PR #132.
 - * eRPC: Update CMSIS UART transport layer to avoid busy loops in rtos environments, introduce semaphores.
 - * eRPC: Introduced pre and post callbacks for eRPC call, GitHub PR #131.
 - * eRPC: Introduced new USB CDC transport.
 - * eRPC: Introduced new Linux spidev-based transport.
 - * eRPC: SPI transport update to allow usage without handshaking GPIO.
 - * eRPC: Native *WIN32 erpc serial transport and threading*.
 - * *eRPC: Arbitrator deadlock fix, TCP transport updated, TCP setup functions introduced, GitHub PR #121.*
 - * *eRPC: Update of matrix_multiply.py example: Add -serial and -baud argument, GitHub PR #137.*
 - * *eRPC: Added formatting extension for VSC, GitHub PR #134.*
 - * *eRPC: Update of .clang-format, GitHub PR #140.*
 - * *eRPC: Update of erpc_framed_transport.cpp: return error if received message has zero length, GitHub PR #141.*
 - * *eRPC, erpcgen: Fixed error messages produced by -Wall -Wextra -Wshadow -pedantic-errors compiler flags, GitHub PR #136, #139.*
 - * *eRPC, erpcgen: Core re-formatted using Clang version 10.*
 - * *erpcgen: Enable deallocation in server shim code when callback/function pointer used as out parameter in IDL.*
 - * *erpcgen: Removed '\$' character from generated symbol name in '\$union' suffix, GitHub PR #103.*
 - * erpcgen: Resolved mismatch between C++ and Python for callback index type, GitHub PR #111.
 - * erpcgen: Python generator improvements, GitHub PR #100, #118.
 - * erpcgen: Fixed error messages produced by -Wall -Wextra -Wshadow -pedantic-errors compiler flags, GitHub PR #136.

- * erpcgen: Introduce ustring type for unsigned char and force cast to char*, GitHub PR #125.
- * RPMsg-Lite: Introduced `RL_ALLOW_CONSUMED_BUFFERS_NOTIFICATION` config option to allow opposite side notification sending each time received buffers are consumed and put into the queue of available buffers.
- * RPMsg-Lite: Added environment layers for Threadx.
- 2.8.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.7.4
 - * eRPC generator (erpcgen) v.1.7.4
 - * Multicore Manager (MCMgr) v4.1.0
 - * RPMsg-Lite v3.1.0
 - New features:
 - * eRPC: Unit test code updated to handle service add and remove operations.
 - * eRPC: Several MISRA issues in rpmsg-based transports addressed.
 - * eRPC: Support MU transport unit testing.
 - * eRPC: Adding mbed os support.
 - * eRPC: Fixed Linux/TCP acceptance tests in release target.
 - * eRPC: Minor documentation updates, code formatting.
 - * erpcgen: Whitespace removed from C common header template.
 - * RPMsg-Lite: MISRA C-2012 violations fixed (7.4).
 - * RPMsg-Lite: Fix missing lock in `rpmsg_lite_rx_callback()` for QNX env.
 - * RPMsg-Lite: Correction of `rpmsg_lite_instance` structure members description.
 - * RPMsg-Lite: Address -Waddress-of-packed-member warnings in GCC9.
 - * RPMsg-Lite: Clang update to v10.0.0, code re-formatted.
- 2.7.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.7.3
 - * eRPC generator (erpcgen) v.1.7.3
 - * Multicore Manager (MCMgr) v4.1.0
 - * RPMsg-Lite v3.0.0
 - New features:
 - * eRPC: Improved the `test_callbacks` logic to be more understandable and to allow requested callback execution on the server side.
 - * eRPC: `TransportArbitrator::prepareClientReceive` modified to avoid incorrect return value type.
 - * eRPC: The `ClientManager` and the `ArbitratedClientManager` updated to avoid performing client requests when the previous serialization phase fails.
 - * erpcgen: Generate the shim code for destroy of statically allocated services.
 - * MCMgr: Code adjustments to address MISRA C-2012 Rules
 - * RPMsg-Lite: MISRA C-2012 violations fixed, incl. data types consolidation.
 - * RPMsg-Lite: Code formatted
- 2.6.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.7.2

- * eRPC generator (erpcgen) v.1.7.2
- * Multicore Manager (MCMgr) v4.0.3
- * RPMsg-Lite v2.2.0
- New features:
 - * eRPC: Improved support of const types.
 - * eRPC: Fixed Mac build.
 - * eRPC: Fixed serializing python list.
 - * eRPC: Documentation update.
 - * eRPC: Add missing doxygen comments for transports.
 - * RPMsg-Lite: Added configuration macro RL_DEBUG_CHECK_BUFFERS.
 - * RPMsg-Lite: Several MISRA violations fixed.
 - * RPMsg-Lite: Added environment layers for QNX and Zephyr.
 - * RPMsg-Lite: Allow environment context required for some environments (controlled by the RL_USE_ENVIRONMENT_CONTEXT configuration macro).
 - * RPMsg-Lite: Data types consolidation.
 - * MCMgr: Documentation updated to describe handshaking in a graphic form.
 - * MCMgr: Minor code adjustments based on static analysis tool findings
- 2.5.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.7.1
 - * eRPC generator (erpcgen) v.1.7.1
 - * Multicore Manager (MCMgr) v4.0.2
 - * RPMsg-Lite v2.0.2
 - New features:
 - * RPMsg-Lite, MCMgr: Align porting layers to the updated MCUXpressoSDK feature files.
 - * eRPC: Fixed semaphore in static message buffer factory.
 - * erpcgen: Fixed MU received error flag.
 - * erpcgen: Fixed tcp transport.
- 2.4.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.7.0
 - * eRPC generator (erpcgen) v.1.7.0
 - * Multicore Manager (MCMgr) v4.0.1
 - * RPMsg-Lite v2.0.1
 - New features:
 - * eRPC: Improved code size of generated code.
 - * eRPC: Generating crc value is optional.
 - * eRPC: Fixed CMSIS Uart driver. Removed dependency on KSDK.
 - * eRPC: List names are based on their types. Names are more deterministic.
 - * eRPC: Service objects are as a default created as global static objects.
 - * eRPC: Added missing doxygen comments.
 - * eRPC: Forbid users use reserved words.
 - * eRPC: Removed outByref for function parameters.
 - * eRPC: Added support for 64bit numbers.
 - * eRPC: Added support of program language specific annotations.

- * eRPC: Optimized code style of callback functions.
- * RMPMsg-Lite: New API `rpmsg_queue_get_current_size()`
- * RMPMsg-Lite: Fixed bug in interrupt handling for `lpc5411x`, `lpc5410x`
- * RMPMsg-Lite: Code adjustments based on static analysis tool findings
- 2.3.1
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.6.0
 - * eRPC generator (erpcgen) v.1.6.0
 - * Multicore Manager (MCMgr) v4.0.0
 - * RMPMsg-Lite v1.2.0
 - New features:
 - * eRPC: Improved code size of generated code.
 - * eRPC: Improved eRPC nested calls.
 - * eRPC: Improved eRPC list length variable serialization.
 - * eRPC: Added `@nullable` support for scalar types.
 - * MCMgr: Added new `MCMGR_TriggerEventForce()` API.
- 2.3.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.5.0
 - * eRPC generator (erpcgen) v.1.5.0
 - * Multicore Manager (MCMgr) v3.0.0
 - * RMPMsg-Lite v1.2.0
 - New features:
 - * eRPC: Added support for unions type non-wrapped by structure.
 - * eRPC: Added callbacks support.
 - * eRPC: Added support `@external` annotation for functions.
 - * eRPC: Added support `@name` annotation.
 - * eRPC: Added Messaging Unit transport layer.
 - * eRPC: Added RMPMSG Lite RTOS TTY transport layer.
 - * eRPC: Added version verification and IDL version verification between eRPC code and eRPC generated shim code.
 - * eRPC: Added support of shared memory pointer.
 - * eRPC: Added annotation to forbid generating `const` keyword for function parameters.
 - * eRPC: Added python matrix multiply example.
 - * eRPC: Added nested call support.
 - * eRPC: Added struct member "byref" option support.
 - * eRPC: Added support of forward declarations of structures
 - * eRPC: Added Python RMPMsg Multiendpoint kernel module support
 - * eRPC: Added eRPC sniffer tool
 - * MCMgr: Unused API removed
 - * MCMgr: Added the ability for remote core monitoring and event handling
 - * RMPMsg-Lite: Several source files renamed to avoid conflicts with other middleware sw components
 - * RMPMsg-Lite: Added the ability to use Multicore Manager (MCMGR) as the IPC interrupts router

- 2.2.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.4.0
 - * eRPC generator (erpcgen) v.1.4.0
 - * Multicore Manager (MCMgr) v2.0.1
 - * RPMsg-Lite v1.1.0
 - New features:
 - * eRPC: win_flex_bison.zip for windows updated.
 - * eRPC: Use one codec (instead of inCodec outCodec).
 - * eRPC: New RPMsg-Lite Zero Copy (RPMsgZC) transport layer.
 - * MCMgr: code updated to be Misra compliant.
 - * RPMsg-Lite: Added macros for packed structures (compiler.h).
 - * RPMsg-Lite: Improved interrupt handling in platform layer.
 - * RPMsg-Lite: Changed RL_BUFFER_SIZE definition.
 - * RPMsg-Lite: Fix of double initialization of vring shared data structure.
 - * RPMsg-Lite: Support for the multi-instance.
- 2.1.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.3.0
 - * eRPC generator (erpcgen) v.1.3.0
 - New features:
 - * eRPC: New annotation types introduced (@length, @max_length, ...).
 - * eRPC: Support for running both erpc client and erpc server on one side.
 - * eRPC: New transport layers for (LP)UART, (D)SPI.
 - * eRPC: Error handling support.
- 2.0.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.2.0
 - * eRPC generator (erpcgen) v.1.2.0
 - * Multicore Manager (MCMgr) v2.0.0
 - * RPMsg-Lite v1.0.0
 - New features:
 - * Multicore SDK support for lpcxpresso54114 board added.
 - * RPMsg component of the Open-AMP framework re-implemented and the RPMsg-Lite version introduced.
 - * eRPC source directory organization changed.
 - * Many eRPC improvements.
- 1.1.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.1.0
 - * Multicore Manager (MCMgr) v1.1.0
 - * Open-AMP / RPMsg based on SHA1 ID 44b5f3c0a6458f3cf80 rev01
 - New features:
 - * Multicore SDK 1.1.0 ported to KSDK 2.0.0.
 - * Python support added into eRPC.

- 1.0.0
 - Multicore SDK component versions:
 - * embedded Remote Procedure Call (eRPC) v1.0.0
 - * Multicore Manager (MCMgr) v1.0.0
 - * Open-AMP / RPMMsg based on SHA1 ID 44b5f3c0a6458f3cf80 rev00

Host USDHC driver for MCUXpresso SDK

The current driver version is 2.6.3.

- 2.6.3
 - Improvements
 - * Added macro SDMMCHOST_SUPPORT_VOLTAGE_CONTROL.
- 2.6.2
 - Bug Fixes
 - * Added clock force on during standard tuning to fix the card access not stable after initialization.
- 2.6.1
 - Improvements
 - * Increased the delay after enable DAT3 detect card feature to fix the misdetect issue.
- 2.6.0
 - Improvements
 - * Removed deprecated api in SDHC host driver.
 - * Added SDMMCHOST_ConvertDataToLittleEndian api.
 - * Added capability/maxBlockCount/maxBlockSize in host decription.
 - * Improved the manual tuning flow according to specification.
 - * Added mutual exclusive access for function init/deinit/reset/transfer function.
 - * Fixed violations of MISRA C-2012 rule 10.1, 10.4, 16.3, 4.7.
- 2.5.3
 - Bug Fixes
 - * Corrected the DAT3 detect card flow by PULL down the DAT3 pin firstly and then enable the host DAT3 function.
- 2.5.2
 - Improvements
 - * Improved DAT3 card detect mechanism to avoid card false detection.
- 2.5.1
 - Improvements
 - * Enabled DAT3 card detect interrupt in function SDMMCHOST_PollingCardDetectStatus to support DAT3 re-detect card.
- 2.5.0
 - Improvements
 - * Added cache line size alignment maintain for the read transfer.
 - * Added FSL_FEATURE_HAS_L1CACHE to enable cache maintain operation for the soc has LMEM cache.

- Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 15.7, 4.7, 16.4, 10.1, 10.3, 10.4, 11.3, 14.4, 10.6, 17.7, 16.1, 16.3.
- 2.4.0
 - Improvements
 - * Added cache maintain functionality in the host driver.
 - * Enabled DAT3 card detect feature.
 - * Increase the default STD tuning counter to 60 to cover range of the tuning window.
 - * Added host instance capability macro.
 - * Added clear card inserted/removed event when card removed/inserted interrupt generated.
- 2.3.0
 - Improvements
 - * Merged the host controller driver from polling/freertos/interrupt to non_blocking/blocking.
 - * Added SDMMC OSA layer to support muxtex access/event/delay.
- 2.2.14
 - Bug Fixes
 - * Fixed uninitialized value Coverity issue.
- 2.0.0
 - Initial version

MMC Card driver for MCUXpresso SDK

The current driver version is 2.5.0.

- 2.5.0
 - Improvements
 - * Added api MMC_SetSleepAwake to support enter/exit sleep state.
 - * Added new api MMC_PollingCardStatusBusy for application polling card status.
 - * Removed deprecated api in mmc driver and mark MMC_HostReset as deprecated.
 - * Improved the read/write/erase function flow.
 - * Added mutual exclusive access for init/deinit/read/write/erase function.
 - * Fixed violations of MISRA C-2012 rule 4.7, 17.7, 10.7, 10.4, 13.5, 14.4, 10.6.
- 2.4.1
 - Improvements
 - * Improved the voltage window argument of CMD1 according to host capability instead of use card ocr directly.
 - * Added host HS200/HS400/8bit bus width capability validation during card initialization.
 - * Used cache line size align buffer for MMC relate api.
 - * Increased the CMD13 timeout count to avoid polling CMD13 time out issue.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 15.7, 4.7, 16.4, 10.1, 10.3, 10.4, 11.3, 14.4, 10.6, 17.7, 16.1, 16.3.
- 2.4.0
 - Improvements

- * Added new apis MMC_EnableCacheControl/MMC_FlushCache to support cache feature.
- 2.3.1
 - Improvements
 - * Removed the dead loop while polling DAT0 and CMD13 instead of using timeout mechanism.
 - * Added card state check before switching to HS400 to improve the emmc initialization stability.
 - * Removed the redundant operation of memset internal buffer in MMC_WrtiteBlocks function.
 - Bug Fixes
 - * Fixed the sandisk emmc always busy while sending CMD1 without supported voltage provide in argument.
- 2.3.0
 - Improvements
 - * Deprecated api MMC_PowerOnCard/MMC_PowerOffCard by api MMC_SetCardPower.
 - * Added internalBuffer in mmc_card_t and removed rawCid/rawCsd/rawExtendedCsd.
 - * Added retuning support during data transfer under HS200 mode.
 - * Increased the read/write blocks failed retry times for stability.
 - * Added delay while retry the CMD1 for stability.
 - * Added legacy card support, the card not support CMD6, CMD8.
- 2.2.13
 - Improvements
 - * Used the boot mode value instead of boot mode mask value as the parameter of MMC_SetBootConfig to improve user experience.
 - * Removed dynamic voltage switch feature for mmc, according to JEDEC standard, the voltage should be fixed after power up.
- 2.2.12
 - Improvement
 - * Increased the CMD1 retry times in the MMC card driver to improve driver compatibility.
 - Bug Fixes
 - * Fixed the build warning by changing the old style function declaration static status_t inline to static inline status_t(found by adding -Wold-style-declaration in armgcc build flag).
 - * Fixed the fall through build warning by adding SUPPRESS_FALL_THROUGH_WARNING() in mmc driver.
- 2.2.7
 - Bug Fixes
 - * Fixed MDK 66-D warning.
- 2.2.6
 - Improvements
 - * Saved MMC OCR registers while sending CMD1 with argument 0.
 - Bug Fixes
 - * Added MMC_PowerOn function in which there is delay function after powerup sdcard. Otherwise, the card initialization by fail.
- 2.2.5
 - Improvements

- * Added `SDMMC_ENABLE_SOFTWARE_TUNING` to enable/disable software tuning and it is disabled by default.
- 2.2.4
 - Bug Fixes
 - * Fixed DDR mode data sequence miss issue, which is caused by `NIBBLE_POS`.
 - Improvements
 - * Increased `g_sdmmc` 512byte to improve the performance when application use a non-word align data buffer address.
 - * Used OCR access mode bits to determine the mmccard high capacity flag.
- 2.2.3
 - Bug Fixes
 - * Added response check for send operation condition command. If not checked, the card may occasionally init fail.
- 2.2.1
 - Improvements
 - * Improved MMC Boot feature.
- 2.2.0
 - Improvements
 - * Optimized tuning/mmc switch voltage/mmc select power class/mmc select timing function.
 - * Added strobe dll for mmc HS400 mode.
 - * Added write complete wait operation for `MMC_Write` to fix command timeout issue.
- 2.1.2
 - Improvements
 - * Improved SDMMC to support eMMC v5.0.
 - Bug Fixes
 - * Fixed incorrect comparison between count and length in `MMC_ReadBlocks/MMC_WriteBlocks`.
- 2.1.1
 - Bug Fixes
 - * Fixed the block range boundary error when transferring data to MMC card.
- 2.1.0
 - Improvements
 - * Optimized the function of setting maximum data bus width for MMC card.
- 2.0.0
 - Initial version

SD Card driver for MCUXpresso SDK

The current driver version is 2.4.1.

- 2.4.1
 - Improvements
 - * Added macro `SDMMCHOST_SUPPORT_VOLTAGE_CONTROL` for the host which

not support voltage control.

- 2.4.0
 - Improvements
 - * Removed deprecated api in sd driver.
 - * Added new api SD_PollingCardStatusBusy for application polling card status.
 - * Improved the read/write/erase function flow.
 - * Improved the signal line voltage switch flow.
 - * Added powerOnDelayMS/powerOffDelayMS in sd_usr_param_t to allow redefine the default power on/off delay.
 - * Added mutual exclusive access for init/deinit/read/write/erase function.
 - * Fixed the driver strength configurations missed when timing mode switch to non SDR50/-SDR104 mode.
 - * Fixed violations of MISRA C-2012 rule 4.7, 17.7, 10.7, 10.4, 13.5, 14.4.
- 2.3.3
 - Improvements
 - * Added host SDR timing mode capability validation during card initialization.
 - * Added pilling card ready for data status when transfer data failed.
 - * Used cache line size align buffer for SD initialization api.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 15.7, 4.7, 16.4, 10.1, 10.3, 10.4, 11.3, 14.4, 10.6, 17.7, 16.1, 16.3.
- 2.3.2
 - Improvements
 - * Moved power off function after card detect in SD_Init for DAT3 detect card feature.
- 2.3.1
 - Improvements
 - * Removed the dead loop while polling DAT0 and CMD13 instead of using timeout mechanism.
- 2.3.0
 - Improvements
 - * Marked api SD_HostReset/SD_PowerOnCard/SD_PowerOffCard/SD_WaitCardDetect-Status as deprecated.
 - * Added new api SD_SetCardPower/SD_PollingCardDetectStatus/SD_HostDoReset.
 - * Added internalBuffer in sd_card_t and removed rawCid/rawCsd/rawScr.
 - * Added retuning support during data transfer under SDR50/SDR104 mode.
 - * Increased the read/write blocks failed retry times for stability.
 - * Added delay while retry the ACMD41 for stability.
- 2.2.12
 - Improvements
 - * Increased the sd io driver strength for SD2.0 card.
 - Bug Fixes
 - * Fixed the build warning by changing the old style function declaration static status_t inline to static inline status_t(found by adding -Wold-style-declaration in armgcc build flag).
- 2.2.10
 - Bug Fixes

- * Added event value check for all the FreeRTOS events to fix program hangs when a card event occurs before create.
- 2.2.7
 - Bug Fixes
 - * Fixed MDK 66-D warning.
- 2.2.5
 - Improvements
 - * Added SD_ReadStatus api to get 512bit SD status.
 - * Added error log support in sdcard functions.
 - * Added SDMMC_ENABLE_SOFTWARE_TUNING to enable/disable software tuning and it is disabled by default.
- 2.2.4
 - Bug Fixes
 - * Fixed DDR mode data sequence miss issue, which is caused by NIBBLE_POS.
 - Improvements
 - * Increased g_sdmmc 512byte to improve the performance when application use a non-word align data buffer address.
 - * Enabled auto cmd12 for SD read/write.
- 2.2.3
 - Bug Fixes
 - * Added response check for send operation condition command. If not checked, the card may occasionally init fail.
- 2.2.1
 - Improvements
 - * Kept SD_Init function for forward compatibility.
- 2.2.0
 - Improvements
 - * Separated the SD/MMC/SDIO init API to xxx_CardInit/xxx_HostInit.
 - * SD_Init/SDIO_Init will be deprecated in the next version.
- 2.1.6
 - Improvements
 - * Enhanced SD IO default driver strength.
- 2.1.5
 - Bug Fixes
 - * Fixed Coverity issue.
 - * Fixed SD v1.x card write fail issue. It was caused by the block length set error.
 - * Fixed card cannot detect dynamically.
- 2.1.3
 - Bug Fixes
 - * Fixed Non high-speed sdcard init fail at switch to high speed.
 - Improvements
 - * Added Delay for SDCard power up.
- 2.1.2
 - Improvements
 - * Improved SDMMC to support SD v3.0.

- 2.1.1
 - Bug Fixes
 - * Fixed the bit mask error in the SD card switch to high speed function.
 - Improvements
 - * Optimized the SD card initialization function.
- 2.1.0
 - Bug Fixes
 - * Changed the callback mechanism when sending a command.
 - * Fixed the performance low issue when transferring data.
 - Improvements
 - * Changed the name of some error codes returned by internal function.
 - * Merged all host related attributes to one structure.
- 2.0.0
 - Initial version.

SDIO Card driver for MCUXpresso SDK

The current driver version is 2.4.1.

- 2.4.1
 - Improvements
 - * Added macro `SDMMCHOST_SUPPORT_VOLTAGE_CONTROL` for the host which not support voltage control.
- 2.4.0
 - Improvements
 - * Removed deprecated api in sdio driver.
 - * Improved the signal line voltage switch flow.
 - * Added `powerOnDelayMS/powerOffDelayMS` in `sdio_usr_param_t` to allow redefine the default power on/off delay.
 - * Added mutual exclusive access for `init/deinit/direct/extend` function.
 - * Fixed violations of MISRA C-2012 rule 4.7, 17.7, 10.1, 12.2.
- 2.3.3
 - Bug Fixes
 - * Fixed logical dead code coverity issue.
 - Improvements
 - * Removed deprecated api in sdio driver.
- 2.3.2
 - Improvements
 - * Added host SDR timing mode capability validation during card initialization.
 - * Used cache line size align buffer for SDIO initialization api.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 11.9, 15.7, 4.7, 16.4, 10.1, 10.3, 10.4, 11.3, 14.4, 10.6, 17.7, 16.1, 16.3.
- 2.3.1

- Improvements
 - * Moved power off function after card detect in SD_Init for DAT3 detect card feature.
- 2.3.0
 - Improvements
 - * Marked api SDIO_HostReset/SDIO_PowerOnCard/SDIO_PowerOffCard/SDIO_Wait-CardDetectStatus as deprecated.
 - * Added new api SDIO_SetCardPower/SDIO_PollingCardDetectStatus/SDIO_HostDo-Reset.
 - * Added internalBuffer in sdio_card_t for card register content extract and improve the data access efficiency.
 - * Added retry function after switch to target timing failed in SDIO_SelectBusTiming.
 - * Changed default bus clock from 400KHZ to 25MHZ.
- 2.2.13
 - Improvements
 - * Removed the sdio card interrupt from sdio host initialization, since the card interrupt enablement should be determined by application.
 - Bug Fixes
 - * Fixed Out-of-bounds write Coverity issue.
- 2.2.12
 - Improvements
 - * Added manual tuning function for looking for the tuning window automatically.
 - * Fixed the build warning by changing the old style function declaration static status_t inline to static inline status_t(found by adding -Wold-style-declaration in armgcc build flag).
 - * Fixed the fall through build warning by adding SUPPRESS_FALL_THROUGH_WARNING() in sdio driver.
- 2.2.11
 - Bug Fixes
 - * Added check card async interrupt capability in function SDIO_GetCardCapability.
 - * Fixed OUT OF BOUNDS access in function SDIO_IO_Transfer.
- 2.2.10
 - Bug Fixes
 - * Fixed SDIO card driver get an incorrect io number when the card io number is bigger than 2.
 - Improvements
 - * Added SDIO 3.0 support.
 - * Added API SDIO_IO_RW_Direct for direct read/write card register access.
- 2.2.9
 - Improvements
 - * Added API SDIO_SetIOIRQHandler/SDIO_HandlePendingIOInterrupt to handle multi io pending IRQ.
- 2.2.8
 - Improvements
 - * Updated sdmmc to support SDIO interrupt.
 - * Added API SDIO_GetPendingInterrupt to get the pending io interrupt.
- 2.2.7

- Bug Fixes
 - * Fixed MDK 66-D warning.
- 2.2.6
 - Improvements
 - * Added an unify transfer interface for SDIO.
 - Bug Fixes
 - * Fixed Wrong pointer address used by SDMMCHOST_Init.
- 2.1.5
 - Improvements
 - * Improved SDIO card init sequence and add retry option for SDIO_SwitchToHighSpeed function.
- 2.1.4
 - Improvements
 - * Added Go_Idle function for SDIO card.
- 2.0.0
 - Initial version.

USB stack for MCUXpresso SDK

The current version of USB stack is 2.8.4.

- 2.8.4
 - Improvement:
 - * Add the new netc adatper for the new netc driver.
 - * Fix issues for USB device dfu and usb device msc when enable the macro USB_DEVICE_CONFIG_RETURN_VALUE_CHECK.
 - * Change the header file including order for usb.h header.
 - * Update the USB host audio class driver to fix the wrong output log.
 - * Add the workaround on dev_hid_mouse_bm case for the errata TN00071.
 - * Enable ROOT2 macro in USB device stack.
 - * Use an unified definiton for the base address of RTxxxx platforms.
- 2.8.3
 - Improvement:
 - * Update the EHCI controller driver to support the address convert for TCM.
 - * Update the USB host EHCI controller driver to make sure the mutual exclusion access under multiple tasks' environment.
- 2.8.2
 - Improvement:
 - * Fix noise issue of UAC 3.1, UAC 5.1, UAC 7.1 on usb audio speaker demo.
 - * Fix the issue that incorrect PC behavior when ejecting USB MSC devices.
 - * Update the EHCI controller driver to support RW610 that does not reply on PHY driver, especially for low power feature.
 - * Update the USB_HostHelperParseAlternateSetting to fix the wrong interface parse.
 - * Update dev_composite_hid_audio_unified_bm demo to support independent mute/unmute

and volume control.

- 2.8.1
 - Improvement:
 - * update USB audio demos to use audio component (components).
 - * Add the checking of function call return value.
 - * Add audio multiple channels demo (usb_device_composite_audio_multi_ch_unified) on RT600 audio board.
 - * Fix audio noise on sync mode and improve overflow/underflow checking method.
 - * Support UAC 3.1, 5.1 and 7.1 on audio speaker demo.
 - * Set USB device CDC demo not to depend on DTR setting from host.
 - * Support MCUX toolchain on some RTxxxx platforms.
- 2.8.0
 - Improvement:
 - * Fix the USB device stack vulnerability issues.
 - * Update the audio PLL and FRO adjustment codes for audio examples in RTxxx, LP-C54xxx and LPC55xxx.
 - * Improve the USB PD AMS collision avoidance.
 - * Improve IP3511 controller driver's dedicated ram allocation.
 - * Change the USB_DATA_ALIGN_SIZE to 4 because the controller driver uses the dedicated RAM to do memcpy.
 - New features:
 - * Enable USB host audio recorder demo for mutilple boards.
- 2.7.0
 - Improvement:
 - * Use new feedback solution and low latency playback for usb device speaker demo and unified demos. Add underflow and overflow protection.
 - * Optimize hard code for usb audio demos.
 - * Update Unconstrained Power field in the Sink Capabilities Message according to the external power state.
 - * Fix CVE-2021-38258 and CVE-2021-38260
 - New features:
 - * Enable USB host video demo for mutilple boards.
 - * Enable USB device MTP demo for mutilple boards.
 - * Add PPS message to usb pd stack.
- 2.6.1
 - Improvement:
 - * rename sdcard as disk for all of sdcard demos. For ramdisk demos, they are not changed.
 - * add wrapper for all of disk demos to support emmc.
- 2.6.0
 - Improvement:
 - * Added more ufi event to support dynamic sdcard capacity.
 - * Passed MISRA-2012 mandatory and required rules.
 - Except rule 17.2 in host hub and otg stack.
 - Except rule 5.1, rule 5.4, rule 21.1 and rule 21.2.
 - * Re-implemented USB components and supported NPW.

- * Improved IP3511 controller driver's cancelling transfer function.
 - * Enabled the audio2.0 defaultly for device audio demos.
 - * Enabled the host audio2.0 function in host audio class driver and host audio speaker demo.
- New features:
 - * enable two USB controllers in one USB host mouse demo which named as host_hid_-mouse_dual.
 - * enable UAC 5.1 for usb device audio speaker demo.
- 2.5.0
 - Improvement:
 - * Integrated sdk components (OSA, Timer, GPIO and serial_manager) to USB stack and demos.
 - * Improved the ip3511 driver throughput.
 - * Improved audio initialization codes after SDK audio drivers update.
 - * Improved audio to support the audio2.0 in win10.
 - * Add one "enumeration fail" callback event to host stack.
- 2.4.2
 - Improvement:
 - * Put the USB controller data and transfer buffer to noncache section, removed the setting that sets the whole ocram and sdram as noncached.
 - * Separated composite audio examples' channel,sample rate,format parameters from commom macro to in dedicated macro and out dedicated macro.
 - * replaced USB_PrepareData with USB_AudioRecorderGetBuffer.
- 2.4.1
 - New features:
 - * Added enumeration fail callback to host stack when the attached device's enumeration failed.
- 2.4.0
 - Improvement:
 - * Device Charger Detection (DCD) software architecture was refactored.
 - New features:
 - * Enabled Device Charger Detection (DCD) on RT1060.
 - * Enabled Device Charger Detection on RT600.
 - * Enabled host battery charger function on RT600.
- 2.3.0
 - New features:
 - * Added host video camera support. example: usb_host_video_camera
 - * Added a new device example. example: usb_device_composite_cdc_hid_audio_unified
- 2.2.0
 - New features:
 - * Added device DFU support.
 - * Supported OM13790DOCK on LPCXpresso54018.
 - * Added multiple logical unit support in msc class driver, updated usb_device_lba_-information_struct_t to support this.
 - * Supported multiple transfers for host ISO on IP3516HS.
 - Bug fixes:

- * Fixed device ip3511 prime data length than maxpacket size issue.
- * Initialized interval attribute in usb_device_endpoint_struct_t/usb_device_endpoint_init_struct_t.
- * Removed unnecessary header file in device CDC class driver, removed unnecessary usb_echo, and added DEBUG macro for necessary usb_echo in device CDC class driver.
- * Fixed device IP3511HS unfinished interrupt transfer missing issue.
- 2.1.0
 - New features:
 - * Added host RNDIS support. example: lwip_dhcp_usb
 - * Enabled USB 3.0 support on device stack.
 - * Power Delivery feature: Added OM13790HOST support; Added auto policy feature; Printed e-marked cable information;
- 2.0.1
 - Bug fixes:
 - * Fixed some USB issues: Fixed MSC CV test failed in MSC examples.
 - * Changed audio codec interfaces.
- 2.0.0
 - New features:
 - * PTN5110N support.
 - Bug fix:
 - * Added some comments, fixed some minor USB issues.
- 1.9.0
 - New features:
 - * Examples:
 - usb_pd_alt_mode_dp_host
- 1.8.2
 - Updated license.
- 1.8.1
 - Bug fix:
 - * Verified some hardware issues, support aruba_flashless.
- 1.8.0
 - New features:
 - * Examples:
 - usb_device_composite_cdc_vcom_cdc_vcom
 - usb_device_composite_hid_audio_unified
 - usb_pd_sink_battery
 - Changed usb_pd_battery to usb_pd_charger_battery.
 - Bug fix:
 - * Code clean up, removed some irrelevant code.
- 1.7.0
 - New features:
 - * USB PD stack support.
 - Examples:
 - * usb_pd
 - * usb_pd_battery

- * usb_pd_source_charger
- 1.6.3
 - Bug fix: -IP3511_HS driver control transfer sequence issue, enabled 3511 ip cv test.
- 1.6.2
 - New features:
 - * Multi instance support.
- 1.6.1
 - New features:
 - Changed the struct variable address method for device_video_virtual_camera and host_phdc_manager.
- 1.6.0
 - New features:
 - * Supported Device Charger Detect feature on usb_device_hid_mouse.
- 1.5.0
 - New features:
 - * Supported controllers
 - OHCI (Full Speed, Host mode)
 - IP3516 (High Speed, Host mode)
 - IP3511 (High Speed, Device mode)
 - * Examples:
 - usb_lpm_device_hid_mouse
 - usb_lpm_device_hid_mouse_lite
 - usb_lpm_host_hid_mouse
- 1.4.0
 - New features:
 - * Examples:
 - usb_device_hid_mouse/freertos_static
 - usb_suspend_resume_device_hid_mouse_lite
- 1.3.0
 - New features:
 - * Supported roles
 - OTG
 - * Supported classes
 - CDC RNDIS
 - * Examples
 - usb_otg_hid_mouse
 - usb_device_cdc_vnic
 - usb_suspend_resume_device_hid_mouse
 - usb_suspend_resume_host_hid_mouse
- 1.2.0
 - New features:
 - * Supported controllers
 - LPC IP3511 (Full Speed, Device mode)
- 1.1.0
 - Bug fix:

- * Fixed some issues in USB certification.
- * Changed VID and Manufacturer string to NXP.
- New features:
 - * Supported classes
 - Pinter
 - * Examples:
 - usb_device_composite_cdc_msc_sdcard
 - usb_device_printer_virtual_plain_text
 - usb_host_printer_plain_text
- 1.0.1
 - Bug fix:
 - * Improved the efficiency of device audio speaker by changing the transfer mode from interrupt to DMA, thus providing the ability to eliminate the periodic noise.
- 1.0.0
 - New features:
 - * Supported roles
 - Device
 - Host
 - * Supported controllers:
 - KHCI (Full Speed)
 - EHCI (High Speed)
 - * Supported classes:
 - AUDIO
 - CCID
 - CDC
 - HID
 - MSC
 - PHDC
 - VIDEO
 - * Examples:
 - usb_device_audio_generator
 - usb_device_audio_speaker
 - usb_device_ccid_smart_card
 - usb_device_cdc_vcom
 - usb_device_cdc_vnic
 - usb_device_composite_cdc_msc
 - usb_device_composite_hid_audio
 - usb_device_composite_hid_mouse_hid_keyboard
 - usb_device_hid_generic
 - usb_device_hid_mouse
 - usb_device_msc_ramdisk
 - usb_device_msc_sdcard
 - usb_device_phdc_weighscale
 - usb_device_video_flexio_ov7670
 - usb_device_video_virtual_camera

- usb_host_audio_speaker
- usb_host_cdc
- usb_host_hid_generic
- usb_host_hid_mouse
- usb_host_hid_mouse_keyboard
- usb_host_msdc_command
- usb_host_msdc_fatfs
- usb_host_phdc_manager
- usb_keyboard2mouse
- usb_pin_detect_hid_mouse

EdgeFast Bluetooth Protocol Abstraction Layer Implementation for MCU-Xpresso SDK

The current version is 1.3.0.

- 1.3.0
 - Improvement:
 - * Updated to Zephyr Bluetooth 3.2.0.
 - * Fix autopts issues.
 - * Improve audio_profile aws part based on new middleware-reference\ example.
 - New features:
 - * Enable EVKMIMXRT1160
 - * Default Bluetooth module is changed to Murata
 - Others:
 - * Remove WIFI_provisioning example.
- 1.2.1
 - Improvement:
 - * Fix autopts issues.
 - * Support creating audio streaming without calling in handsfree_ag.
 - New features:
 - * Enable EVKMIMXRT1040.
 - * Support muRata modules on EVKMIMXRT1040, EVKBIMXRT1050 and EVKBIMXR-T1060.
- 1.2.0
 - Improvement:
 - * Updated to Zephyr Bluetooth 3.0.0
 - * Fix autopts issues.
 - New features:
 - * Enable EVKBIMXRT1050
 - * Enable peripheral_beacon on all boards.
- 1.1.1
 - New features:
 - * Enable peripheral_beacon example in EVKMIMXRT1170 board.

- 1.1.0
 - Improvement:
 - * Updated to Zephyr Bluetooth 2.6.0
 - * change fixed wireless_uart central and peripheral role number to flexiable number.
- 1.0.0
 - New features:
 - * Enable SMP Pairing and Bonding feature for BLE
 - * Enable AVRCP
 - * Enable L2CAP for BR
 - * Add examples wireless_uart and edgefast_bluetooth_shell
 - * Enable data signing, GATT caching, GATT service changed features
 - * Enable data len update, whitelist, phy update
 - * Enable privacy mode
 - * Enable setting for bonding
 - * Enable A2DP content protection/recovery/reporting/delay reporting/header compression/multiplexing services.
 - Improvement:
 - * Enhance SPP to support multiple connection
 - * Use LittleFS to manage the NVM.
 - * Improve A2DP APIs and implementation.
 - Add endpoint callbacks to struct bt_a2dp_endpoint.
 - Add content protection/recovery/reporting/delay reporting/header compression/multiplexing related fields to struct bt_a2dp_endpoint and struct bt_a2dp_control_cb.
 - Upgrade struct a2dp_configure_result to struct bt_a2dp_endpoint_configure_result.
 - Add deconfigured callback.
 - Change sink_start_play callback to start_play callback.
 - Change sink_suspend_play callback to stop_play callback.
 - Add bt_a2dp_disconnect API.
 - Remove bt_a2dp_register_control_callback API.
 - Change bt_a2dp_configure API's callback.
 - Add peer_endpoint to bt_a2dp_configure_endpoint API.
 - Change bt_a2dp_src_start to bt_a2dp_start.
 - Change bt_a2dp_src_suspend to bt_a2dp_stop.
 - Remove bt_a2dp_get_configured_peer_endpoint.
 - Change the parameter as endpoint for the APIs: bt_a2dp_deconfigure, bt_a2dp_start, bt_a2dp_stop, bt_a2dp_reconfigure, bt_a2dp_src_media_write and bt_a2dp_snk_media_sync.
 - Add new APIs for content protection/delay reporting services: bt_a2dp_set_cp_header, bt_a2dp_set_initial_delay_report and bt_a2dp_send_delay_report.
- 0.1.0
 - New features:
 - * Initialization version

EdgeFast Bluetooth PAL for MCUXpresso SDK

The current version is 1.3.0.

- 1.3.0 (Based on Zephyr V3.2, commit: 4256cd41df6c60f1832fd2deb14edc30ac7debab)
 - New features:
 - * Update the header files to Zephyr V3.2 base.
- 1.2.0 (Based on Zephyr V3.0, commit: 4f8d78ceeb436e82f528511998515f6fc137c6cd)
 - New features:
 - * Update the header files to Zephyr V3.0 base.
- 1.1.0 (Based on Zephyr V2.6, commit: 2595cce7143cd34bc9e35405de4968dc58052692)
 - New features:
 - * Update the header files to Zephyr V2.6 base.
- 1.0.0 (Based on Zephyr V2.5, commit: dabf23758417fd041fec2a2a821d8f526afac29d)
 - New features:
 - * Update the header files to Zephyr V2.5 base.
- 0.1.0 (Based on Zephyr V2.4, tag: v2.4.0)
 - New features:
 - * Initialization version

3 Component Change Log

CODEC

The current codec common driver version is 2.3.1.

- 2.3.1
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 16.1,16.3.
- 2.3.0
 - Improvements
 - * Added enum `_codec_volume_capability` for `CODEC_SetVolume/CODEC_SetMute` to cover more volume configurations.
- 2.2.2
 - Bug Fixes
 - * Fixed the typo in codec common driver.
- 2.2.1
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 10.3, 8.3, 10.7, 17.7.
- 2.2.0
 - Improvements
 - * Used `HAL_CODEC_HANDLER_SIZE` which is determined by low level driver instead of use `CODEC_HANDLE_SIZE` for the codec device handle definition.
- 2.1.1
 - Improvements
 - * Supported all of the codec in the codec adapter.
 - * Modified the codec handle definition to improve user experience.
 - * Modified the capability member type from entity to pointer in codec handle.
 - Bug Fixes
 - * Fixed the Coverity issue regrading array compared against 0.
- 2.1.0
 - Deprecated APIs
 - * `CODEC_GetMappedFormatBits`
 - * `CODEC_I2C_WriteReg`
 - * `CODEC_I2C_ReadReg`
 - * `CODEC_I2C_ModifyReg`
 - * `CODEC_SetEncoding`
 - new APIs
 - * `CODEC_SetPower`
 - * `CODEC_SetVolume`
 - * `CODEC_SetMute`
 - * `CODEC_SetPlay`
 - * `CODEC_SetRecord`
 - * `CODEC_SetRecordChannel`

- * CODEC_ModuleControl
- new features
 - * Removed duplicate members in codec_handle_t and codec_config_t.
 - * Added codec_config_t pointer in codec_handle_t.
 - * Added codec capability flag in codec_handle_t.
 - * Used codec adapter instead of function pointer in codec common driver.
- 2.0.1
 - Added delayMs function pointer in codec handle.
- 2.0.0
 - Initial version.

WM8904

The current wm8904 driver version is 2.5.1.

- 2.5.1
 - Bug Fixes
 - * Fixed invalid clock divider issue generated from WM8904_SetMasterClock api
 - * Replace ‘__REV16’ with general implementation to swap bytes in a short variable.
- 2.5.0
 - Improvements
 - * Added master clock configuration support in function WM8904_SetAudioFormat.
 - * Align the sysclk paramter definition for the WM8904_SetAudioFormat/WM8904_SetMasterClock.
 - * Added api WM8904_SetDACVolume to support adjust DAC volume.
 - * Fixed the MISRA-2012 violation of 12.2, 10.3.
- 2.4.4
 - Bug Fixes
 - * Added the 11.025kHz/22.05kHz/44.1kHz samplerate support on codec WM8904.
 - * Fixed the MISRA-2012 violation of 4.7.
- 2.4.3
 - Bug Fixes
 - * Fixed the MISRA-2012 violations.
 - Fixed rule 8.6, 9.3, 10.1, 10.3, 10.4, 10.7, 10.8, 11.8, 11.9, 14.4, 16.1, 16.3, 16.4, 17.7, 20.9.
- 2.4.2
 - Bug Fixes
 - * Corrected the volume setting function behavior in wm8904 driver, support range align with its specification range.
 - * Corrected the volume setting function behavior in wm8904 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
- 2.4.1
 - Bug Fixes
 - * Fixed the bit width register field overwritten issue.

- 2.4.0
 - New features
 - * Added flt support in wm8904 driver.
- 2.3.0
 - Improvements
 - * Added new API WM8904_SetMasterClock to support BCLK/LRCLK output mode.
- 2.1.0
 - new APIs
 - * WM8904_ReadRegister
 - * WM8904_WriteRegister
 - * WM8904_ModifyRegister
 - * WM8904_SetRecord
 - * WM8904_SetPlay
 - * WM8904_SetRecordChannel
 - * WM8904_SetModulePower
 - * WM8904_SetChannelVolume
 - * WM8904_SetChannelMute

New features

- Removed dependency on codec common driver.
- Added dependency on codec i2c.

Bug Fixes

- Fixed unchecked return value in WM8904_Deinit.
- Fixed the alignment fault issue by adding __NOP between continuous memory access.

2.0.3

- Bug Fixes
 - Fixed issue that wm8904 register access function truncated return value.

2.0.2

- Bug Fixes
 - Fixed using uninitialized value format.fsRatio when calling WM8904_UpdateFormat.

2.0.1

- Added WM8904_CheckAudioFormat API.
- Changed the second parameter's name of WM8904_SetAudioFormat to sysclk.

2.0.0

- Initial version.

CS42888

The current cs42888 driver version is 2.1.3

- 2.1.3

- Improvements
 - * Removed the assertion for codec reset function pointer.
- 2.1.2
 - Improvements
 - * Corrected the volume setting function behavior in CS42888 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
 - Bug Fixes
 - * Fixed violations of MISRA C-2012 rule 4.7, 10.3, 8.3, 10.7, 17.7.
 - * Corrected the channel index during setting AIN volume in CS42888_Init.
- 2.1.1
 - Improvements
 - * Used software delay with delayMs pointer not provided by application.
 - * Fixed error status overwrite issue in CS42888_Init function.
 - * Removed dependency on codec common driver.
 - * Added API CS42888_SelectFunctionalMode/CS42888_SetChannelMute.
 - * Added dependency on codec i2c.
- 2.1.0
 - Improvements
 - * Unified CS42888 codec driver interface.
 - * Bug Fixes
 - Corrected the ADC/DAC functional mode macro definition.
 - Added TDM and OLM mode support in the function CS42888_SetProtocol.
- 2.0.0
 - Initial version.

SERIAL_MANAGER

The current Serial_Manager component version is 1.0.2.

- 1.0.2
 - Add SerialManager_WriteTimeDelay()/SerialManager_ReadTimeDelay() for serial manager's read/write non-blocking mode.
- 1.0.1
 - Add prefixing fsl_component_XXX/fsl_adapter_XXX.
- 1.0.0
 - Initial version

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