Zigbee EmberZNet SDK 6.10.1.0 GA
Gecko SDK Suite 3.2
July 21, 2021

Silicon Labs is the vendor of choice for OEMs developing Zigbee networking into their products. The Silicon Labs Zigbee platform is the most integrated, complete, and feature-rich Zigbee solution available.

Silicon Labs EmberZNet SDK contains Silicon Labs' implementation of the Zigbee stack specification.

These release notes cover SDK version(s):

6.10.1.0 released July 21, 2021
6.10.0.0 released June 16, 2021

KEY FEATURES

- Support for redesigned MG22 radio board (BRD4183C)
- Updated IAR and GCC compiler versions

Compatibility and Use Notices

For information about security updates and notices, see the Security chapter of the Gecko Platform Release notes installed with this SDK or on the Silicon Labs Release Notes page. Silicon Labs also strongly recommends that you subscribe to Security Advisories for up-to-date information. For instructions, or if you are new to the Zigbee EmberZNet SDK, see Using This Release.

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 8.50.9.

- Using wine to build with the IarBuild.exe command line utility or IAR Embedded Workbench GUI on macOS or Linux could result in incorrect files being used due to collisions in wine's hashing algorithm for generating short file names.
- Customers on macOS or Linux are advised not to build with IAR outside of Simplicity Studio. Customers who do should carefully verify that the correct files are being used.

GCC (The GNU Compiler Collection) version 10.2.0, provided with Simplicity Studio.

Contents

1 New Items

1.1 New Plugins

None

1.2 New APIs

Added in release 6.10.0.0

emberAddChild() - SoC-only API for adding a child to the child/neighbor table, allowing direct manipulation of these tables by the application.

emberRemoveChild() - SoC-only API for removing a node from child/neighbor table, allowing direct manipulation of these tables by the application.

emberRemoveNeighbor() - SoC-only API for removing a node from neighbor table, allowing direct manipulation of these tables by the application.

1.3 New Sample Applications

None

1.4 New Platform Support

None

2 Improvements

2.1 Plugin Changes

None

2.2 API Changes

None

2.3 Sample App Changes

None

2.4 Framework Changes

None

2.5 Documentation Changes

None

3 Fixed Issues

Fixed in release 6.10.1.0

ID #	Description
683680	A fix was introduced to avoid erroneous association requests when joining a network via Alternate MAC interface, after an unsuccessful joining attempt to a different network.
689998	An issue has been fixed where the Mgmt_NWK_Update_notify command frame would contain incorrect values for the EnergyValues field, where every other byte would be incrementing from 0x0B to 0x12 in hexadecimal. The Mgmt_NWK_Update_notify frame now contains valid energy scan values for each channel scanned.
719332	Fixed an issue where running network-steering after mfglib caused an assert.
719388	Now when the Zigbee coordinator/router leaves a network, we close it cleanly including resetting the permit joining state. This prevents a newly formed network to assume a false open state that might have been set from the previous network.

Fixed in release 6.10.0.0

ID #	Description
480969	ZCL8 specifies default values for the optional optionsMask and optionsOverride fields in certain ZCL commands in the Level and Color Control clusters. When such a command is received and those optional fields are omitted, the specified default values are used. Note, the implementation was already properly handling the absence of these optional command fields. The change made here is to obtain the default values from ZCL cluster metadata, rather than use implementation-chosen defaults. There is no functional change in the behavior of these cluster commands.
493695	Fixed an issue where receiving a malformed link power delta message caused an assert.
622615	Resolved issue where a malformed association response packet may cause a segmentation fault when a null-pointer is dereferenced.
622616	Fixed issue that caused a segmentation fault upon receiving a malformed association request or network rejoin packet.
630405	If a ZCL global command for discovery of cluster commands / attributes specifies the "wildcard" value 0xFFFF in the request's manufacturer-specific code field, we first resolve the lowest numbered manufacturer-specific cluster command ID / attribute ID at or following the request's specified starting ID. We then further resolve to find the lowest-numbered manufacturer-specific code if that cluster command ID / attribute ID happens to be overloaded by more than one manufacturer-specific implementation. Having resolved the manufacturer-specific code, the discovery operation is then executed using that code and the discovery results are returned accordingly. The ZCL response message will reflect the resolved code in the message's manufacturer-specific code field.
652699	The issue of GPD switch crashing is root-caused to inappropriate configuration of the mbed TLS in the GPD framework. The issue is resolved by updating the mbed TLS setup in the framework to use Silicon Labs platform memory manager, and by allocating adequate heap space for the GPD framework.
656677	'sl_mac_make_raw_message' API now takes in a Buffer instead of an array as argument. 'emberReallyAppendToLinkedBuffers' and 'emberAppendToLinkedBuffers' APIs now returns sl_status_t instead of EmberStatus.
675893	Fixed an issue where the Zigbee GB868 stack could get the transmit power originally established for the 2.4 GHz band after switching to the SubGHz band, impacting power negotiation in Enhanced Beacon Requests.
679453	Fixed issue with buttons being unresponsive on DMP sleepy sample app that can only be observed when Polling CLI option is disabled in the idle-sleep plugin.
698048	Fixed issue where ZNet Antenna Diversity CLI did not correctly set TX Antenna mode.
705595	Fixed an issue where custom PA curves provided through the PA Module were not respected when building Silicon Labs Zigbee applications.

4 Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on https://www.si-labs.com/products/software.

ID #	Description	Workaround
82569	RAM corruption (in Packet Buffers) could occur if MAC Filter Match List Size is non-zero and a list of the maximum size is provided to ezspSetValue for EZSP_VALUE_MAC_FILTER_LIST.	No known workaround
106307	Nodetest calChannel command does not wake the radio to work properly.	No known workaround
119939	ZDO IEEE Request's APS ACK proxied by parent incorrectly includes long source address.	No known workaround
135649	Multi-networking can cause APS frame counter confusion between networks.	Use emberAfSecurityInitCallback to add EMBER_NO_FRAME_COUNTER_RESET to EmberInitialSecurityBitmask.
251287	Sleepy sample apps may not include Voltage Scaling, which is required to achieve the lowest current during sleep on some EFR32 parts.	In Hardware Configurator, enable the EMU peripheral if applicable to your part, set Voltage Scaling to TRUE for EM0/EM1 and to Fast Wakeup for EM2/3. In the CMU peripheral, set the clock sources for "EM2 and 3", EM4, RTCC and WDOG to LFXO.
261670	Harden the ZLL touchlink process to mitigate malicious attacks	No known workaround
266341	Z3 Light sample app has two endpoints that support similar cluster commands, so duplicate responses may be generated for certain commands.	No known workaround
271644	A device that performs a classic join to a legacy ZLL gateway may eventually leave the network on its own initiative.	No known workaround
278063	Smart Energy Tunneling plugins have conflicting treatment/usage of address table index	No known workaround
281832	Green Power Common plugin incorrectly formats groupList and groupListCount parameters of GP Pairing Configuration frame.	No known workaround
289569	Network-creator plugin power level picklist doesn't offer full range of supported values for EFR32	Change the range in the plugin.properties file.
295498	UART reception sometimes drops bytes under heavy load in Zigbee+BLE DMP use case	Use hardware flow control or lower the baud rate.
312291	EMHAL: The halCommonGetIntxxMillisecondTick functions on linux hosts currently use the gettimeofday function, which is not guaranteed to be monotonic. If the system time changes, it can cause issues with stack timing.	Modify these functions to use clock_gettime with the CLOCK_MONOTONIC source instead.
331438	Service discovery may time out too quickly in busy networks.	Define EMBER_AF_DISCOVERY_TIMEOUT_QS to customize the timeout period.
338151	Initializing NCP with a low packet buffer count value may cause corrupt packets.	No known workaround
356937	Read/write attribute CLI commands do not support manufacturer-specific ZCL attributes. Some implementations may allow local CLI debug access to display or modify these attributes.	Access the attributes from a remote device in the network via ZCL global Read/WriteAttributes commands.
363162	There is a bug in emberAfAddAddressTableEntry which could allow for duplicate entries in the address table	Under Investigation

ID #	Description	Workaround
387750	Issue with Route Table Request formats on end device.	Under Investigation
398694	Disabling endpoint 2 (Touchlink) in the Z3Light sample app causes high emberRunTask execution time.	Under Investigation
400418	A touchlink initiator cannot link to a non-factory-new end-device target.	Under Investigation
406826	EMHAL: Eeprom Powerdown Plugin may occasionally fail to power down the external flash on the radio board, resulting in higher(about 6 µA) EM2 current.	Reset the radio board.
424355	A non-factory-new sleepy end device touchlink target-capable initiator is not able to receive a device information response in certain circumstances.	Under Investigation
426066	OTA client could reset when it starts to apply the new image if all debug print is disabled.	Modify the function emberAfOtaClientBootloadCallback in souce file "ota-client-policy/ota-client-policy.c", comment the function call of "emberSerialWaitSend".
437502	halInit() is called twice in EmberZNet SPI NCP Host Application.	No known workaround
437704	The OccupiedCoolingSetpoint attribute should be optional by default in Appbuilder.	Modify the "optional" flag from false to true in the OCCUPIED_COOLING_SETPOINT attribute in app/zcl/ha.xml
437817	EMBER_SHORT_CHILD_TIMEOUT defaults to 2 minutes and cannot be overridden as it should.	No known workaround
439062	When receiving a Network Status command as a broadcast, the command frame is neither retransmitted nor added to the broadcast transaction table.	No known workaround
442664	In a dense network with many devices joining simultaneously, a packet buffer assert is sometimes seen when collecting beacons during network steering.	No known workaround
446827	There is a potential for the code to get stuck in an infinite loop if it is unable to write to the edge detect setting of the GPIO in function edgeGpioDevice in file spi-protocol-linux.c.	If using SPI Host, increment the loopCount variable in the while loop.
454935	When the Z3Switch sample app is changed to be a sleepy end device on EFR32MG21, it may reset repeatedly.	Press Reset button, power cycle or disconnect debug interface.
456350	"emberAfPluginIasZoneClientReadAttributesResponseCallback" in "ias-zone-client.c" incorrectly sets the type of "zoneStatus" and "zoneType" attributes to uint8_t. The correct type should be uint16_t.	Modify the type of these two attributes to "uint16_t" in "emberAfPluginIasZoneClientReadAttributesResponseCallback".
465180	The Coexistence Radio Blocker Optimization item "Enable Runtime Control" may block proper Zigbee operation.	Optional 'Wi-Fi Select' Control of Blocker Optimization should be left "Disabled".
468581	ZCL attribute tokens creator codes are likely to change if you add or remove one or more attributes. For instance, if you add an attribute whose cluster ID or attribute ID is not the largest numerically, then this attribute gets inserted into a list of creator codes and makes all creator codes after it to be different (shifted).	Use the script at https://github.com/SiliconLabs/IoT_Utility_Scripts/tree/master/token_preserver to fix this issue.

ID #	Description	Workaround
469704	On EFR32XG2x there is a known issue with the debug interface where a pin reset, connection to a debugger or flashing an image on device could cause a pull up on DBG_TDI and DBG_TDO pins which cannot be reliably disabled in software. On BRD4182A, this could cause the device to be unable to communicate with the Serial flash. As a result a reset loop is possible when a bootloader is used. A pin reset is needed to get the device out of the reset loop. A related software bug that caused a reset loop for applications with application bootloaders is fixed.	Avoid a pin reset of EFR32XG2X when a debugger is attached. If a pin reset is necessary, avoid using PA3 and PA4, or use JTAG instead of SWD.
474616	EEPROM POWERDOWN plugin can't compile on MG22.	No known workaround

475287	The DCDC settings in the Hardware Configurator do not take effect on EFR32MG22 Zigbee SoC samples.	Call the following code in emberAfMainInitCallback()
		#if BSP_DCDC_PRESENT
		EMU_DCDCInit_TypeDef dcdcInit = BSP_DCDC_INIT;
		#if HAL_DCDC_BYPASS
		dcdcInit.dcdcMode = emuDcdcMode_Bypass;
		#endif
		EMU_DCDCInit(&dcdcInit);
		#else
		EMU_DCDCPowerOff();
		#endif

479521	Building Zigbee SoC images with the Smart energy token optimization feature enabled and using the Simplicity Studio 5 IDE will not link the correct stub libraries.	The path to the stub libraries in the .ewp file need to be corrected manually.
480550	The OTA cluster has its own built-in fragmentation method, hence it should not use APS fragmentation. Although, in case APS encryption is enabled it grows the payload of the ImageBlockResponses to a size where the APS fragmentation is activated. This could lead to the OTA process failing.	No known workaround
481128	Detailed Reset Cause and crash details should be available by default via the Virtual UART (Serial 0) on NCP platforms when Diagnostics plugin and Virtual UART peripheral are enabled.	Since Serial 0 is already initialized in the NCP, customers can enable the emberAfNcpInitCallback in the Zigbee NCP Framework and call the appropriate diagnostic functions (halGetExtendedResetInfo, halGetExtendedResetString, halPrintCrashSummary, halPrintCrashDetails, and halPrintCrashData) in this callback to print this data to Serial 0 for viewing in the Network Analyzer capture log. For an example of how to use these functions, refer to the code included in af-main-soc.c's emberAfMainInit() when EXTENDED_RESET_INFO is defined.
481618	The "Network Open Time" option of the Network Creator Security plugin may not work as expected when you open network if the time does not match the transient key timeout.	Set the Network Open time to the same value as the Transient Key Timeout.
486369	If a DynamicMultiProtocolLightSoc forming a new network has child nodes remaining from a network it has left, emberAfGetChildTableSize returns a non-zero value in startIdentifyOnAllChildNodes, causing Tx 66 error messages when addressing the "ghost" children.	Mass-erase the part if possible before creating a new network or programmatically check the child table after leaving the network and delete all children using emberRemoveChild prior to forming a new network.

ID #	Description	Workaround
488977	OTA of EFR32xG2x devices will fail if using Slot Manager with Gecko bootloader 1.10 or newer.	Set the macro "SLOT_MANAGER_VERIFICATION_CONTEXT_SIZE" to "BOOTLOADER_STORAGE_VERIFICATION_CONTEXT_SIZE" in \util\plugin\slot-manager\slot-manager.h. This must be modified in the SDK directly.
494873	The sleepy end device can't rejoin to its previous parent with the rejoining API when the parent's child table is full.	Reset the sleepy end device.
495563	Joining SPI NCP Sleepy End Device Sample App doesn't short poll, therefore the joining attempt fails at the state of Update TC Link Key.	The device that wishes to join should be in Short Poll mode before attempt to join. This mode can be forced by End Device Support plugin.
497832	In Network Analyzer the Zigbee Application Support Command Breakdown for the Verify Key Request Frame mistakenly references the part of the payload that indicates the frame Source Address as the Destination Address.	No known workaround
498094	In function checkForReportingConfig() in metering-server.c, the second input parameter of the invoked function emberAfContainsServer() incorrectly references the attribute ID instead of the cluster ID.	Change the 2nd input parameter from the attribute ID (ZCL_CURRENT_SUMMATION_DELIVERED_ATTRIBUTE_ID) to the cluster ID (ZCL_SIMPLE_METERING_CLUSTER_ID).
519905	Spi-NCP may very rarely fail to start up bootloader communication using the 'bootload' CLI command of the ota-client plugin.	Restart the bootload process
521706	A duplicated attribute ID is assigned in the altConsumptionMonthAttrIds[] array of the gas-proxy-funxtion plugins in gpf-structured-data.c.	Change the second ZCL_PREVIOUS_MONTH6_ALTERNATIVE_CONSUMPTION_DELIVERED_ATTRIBUTE_ID to ZCL_PREVIOUS_MONTH7_ALTERNATIVE_CONSUMPTION_DELIVERED_ATTRIBUTE_ID.
620596	NCP SPI Example for BRD4181A (EFR32xGMG21) nWake default pin defined cannot be used as a wake-up pin.	Change the default pin for nWake from PD03 to a EM2/3 wake-up-enabled pin in the NCP-SPI Plugin.
621144	GP on/off switch example cannot be compiled for the BRD4183A board.	The sample has to be manually modified to use only one button.

621532	A few seconds after NCP-SPI goes to sleep, it will wake-up once and go to sleep again.	Disable the CC1 channel interrupt of RTCC in the callbacks.c file by using the EM23PresleepHook
		`#include "em_emu.h"#include "em_rtcc.h"void EMU_EM23PresleepHook(void)`
		`{`
		`RTCC->CC[1].CTRL &= ~_RTCC_CC_CTRL_MODE_MASK;`
		`RTCC_IntDisable(RTCC_IF_CC1);`
		`RTCC_IntClear(RTCC_IF_CC1);`
		`}`

623755	The Dynamic Multiprotocol Light (DMP) sample application does not currently work on boards without a connection to the LCD display on the WSTK. This includes any custom boards and Silicon Labs boards like BRD4309A/B.	DMP can still be used on these boards, as this is only a limitation of the sample application.
631713	A Zigbee End Device will report address conflicts repeatedly if the plugin "Zigbee PRO Stack Library" is used instead of "Zigbee PRO Leaf Library".	Use the"Zigbee PRO Leaf Library" instead of the "Zigbee PRO Stack Library" plugin.
634828	Certain messages with invalid Source Address (0xFFFE) trigger assert(0) in the application. In Host-NCP model the issue terminates the Host application execution.	Modify the securityAddToAddressCache() in SoC model. The function source is not available in the NCP model, hence the emberPacketHandoffIncoming() function should be used to filter out invalid packets.

ID #	Description	Workaround
643130	Sleepy end device may keep awake for a while if the "minimal wake time" option of plugin "idle/sleep" is set to 0.	Disable debug print.
648861	Routers using optimized scans during network steering will "miss" beacons that are broadcast by nodes that are open but advertise no end-device capacity that is, their child table is full).	No known workaround.
648906	emberChildId API was accidentally removed in EmberZNet 6.8.0.2.	Call sl_mac_child_short_id instead.
652833	Host-NCP based nodes using optimized scans during network steering will "miss" beacons that are broadcast by nodes that are open.	No known workaround.
659010	emberChildIndex API was accidentally removed in EmberZNet 6.8.0.2.	Call sl_mac_child_index instead.
661214	Upgrading NCP from the host side will fail if the communication port between host and NCP is not USART0.	Use USART0 as the communication port.
681929 715425	In Zigbee stack 6.9.0 and beyond, active scanning TX Power is not defined in the graphical interface and is not always the desired power for particular customer applications.This value defaults to 3 dBm.	
683680	Erroneous Association Request can happen when joining network via Alternate MAC interface after an unsuccessful joining attempt to a different network.	Call function emberClearStoredBeacons() from user application before scanning over Alternate MAC network. EMBER_USE_BEACON_CACHE macro also need to be defined.
702802	Slot Manager plugin fails to boot Series 2 devices with Zigbee app and Internal Storage Bootloader with multiple images configured.	Change #define SLOT_MANAGER_VERIFICATION_CONTEXT_SIZE in slot-manager.h from 384 to 556
711280	**In Zigbee stack 6.9.0 and beyond, setting the channel with the mfglibSetChannel API fails and returns an error.**	**No known workaround.**

5 Deprecated Items

<u>Deprecated in release 6.10.0.0</u>

The NodeTest binary is deprecated, and will be removed in the next major release. On the EFR32, NodeTest is replaced by the Manufacturing Library (Zigbee only) and RAILtest (Zigbee and other SDKs, provided through the Flex SDK).

The following plugins have been deprecated in this release:

- bulb-pwm-cli
- bulb-ui
- configuration-server
- connection-manager
- electrical-measurement-server
- illuminance-measurement-server
- led-dim-pwm
- led-rgb-pwm
- led-temp-pwm
- occupancy-pyd1698-cli
- occupancy-sensor-server
- power-configuration-server
- relative-humidity-measurement-server
- security-sensor
- silabs-device-ui
- temperature-measurement-server

6 Removed Items

None

7 Using This Release

This release contains the following:

- Zigbee stack
- Zigbee Application Framework
- Zigbee Sample Applications

For more information about Zigbee and the EmberZNet SDK see UG103.02: Zigbee Fundamentals.

If you are a first-time user, see QSG106: Getting Started with EmberZNet PRO, for instructions on configuring your development environment, building and flashing a sample application, and documentation references pointing to next steps.

7.1   Installation and Use

Use the EmberZNet SDK v6.10.n with the Silicon Labs Simplicity Studio 5 development platform. Installation instructions are provided in the Simplicity Studio 5 online User's Guide. Simplicity Studio ensures that most software and tool compatibilities are managed correctly. Install software and board firmware updates promptly when you are notified.

Documentation specific to the SDK version is installed with the SDK. Additional information can often be found in the knowledge base articles (KBAs). API references and other information about this and earlier releases is available on https://docs.silabs.com/.

7.2   Security Information

Secure Vault Integration

This version of the stack does not integrate Secure Vault Key Management.

Security Advisories

To subscribe to Security Advisories, log in to the Silicon Labs customer portal, then select **Account Home**. Click **HOME** to go to the portal home page and then click the **Manage Notifications** tile. Make sure that 'Software/Security Advisory Notices & Product Change Notices (PCNs)' is checked, and that you are subscribed at minimum for your platform and protocol. Click **Save** to save any changes.

7.3   Support

Development Kit customers are eligible for training and technical support. Use the Silicon Laboratories Zigbee web page to obtain information about all Silicon Labs Zigbee products and services, and to sign up for product support.

You can contact Silicon Laboratories support at http://www.silabs.com/support.

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