Zigbee EmberZNet SDK 6.8.1.0 GA

Gecko SDK Suite 3.0
September 9, 2020

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):

6.8.1.0 released September 9, 2020
6.8.0.2 released July 29, 2020

Zigbee

KEY FEATURES

- Concurrent support for secure and non-secure PAN
- Expanded size of reporting table to 1024 entries
- Green Power sample application updates

Compatibility and Use Notices

If you are new to the EmberZNet SDK, see Using This Release.

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 8.30.1.

- Usingwine 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 7.2.1, provided with Simplicity Studio.

- GCC is not supported with the EM35x, EM358x, and EM359x device families.

Contents

1 New Items

Added in release 6.8.0.2

The feature to concurrently support multiple PANs (multi-PAN) is added in the 6.8.0.1 release. The multi-PAN feature builds upon the existing multi-network feature, however, the multi-network feature limits the number of always-on networks to one, the multi-PAN feature allows for two always-on networks, both of which must be coordinators. The two networks use the same radio to send and receive packets on their own distinctive PAN IDs.

For additional documentation refer to *AN724: Designing for Multiple Networks on a Single Zigbee Chip*.

1.1 New Plugins

Added in release 6.8.0.2

Multi-PAN Library

The new plugin is used by the multi-PAN feature to create a host/NCP application that can support up to two coordinator networks.

Added in release 6.8.0.2

Multirail-demo

A new mutirail-demo plugin has been added. This plugin provides sample code to initialize and interact with a second RAIL handle and is used in the new multi-rail GP sample application.

1.2 New APIs

Added in release 6.8.0.2

Stack Profile and Security Level

Introduced **emberSetStackProfile()** together with the following enums: **EMBER_STACK_PROFILE_NONE, EMBER_STACK_PROFILE_ZIGBEE_PRO, EMBER_SECURITY_LEVEL_NONE, EMBER_SECURITY_LEVEL_Z3**.

In addition to the new API, the Zigbee stack now initializes the stack profile and security level based on the security profile of each network so that multi-PAN devices are able to form networks with different stack profiles and security levels.

For additional documentation refer to the Zigbee Framework API Reference Guide.

1.3 New Sample Applications

Added in release 6.8.1.0

Added prebuilt binaries of the Z3Light and Z3Switch sample applications on BRD4180A.

Added in release 6.8.0.2

Multi-PAN

A new set of Host (MpZ3TcCustomTcHost) and NCP (mp-ncp-spi or mp-ncp-uart) sample applications is added. These sets demonstrate the multi-PAN feature. The host application is a Zigbee 3.0 coordinator on the first network and a coordinator with no security on the second network and is meant to connect to an NCP running one of the multi-PAN NCP applications.

ZigbeeMinimalHost

The EmberZNet ZigbeeMinimalHost sample application provides a minimal functional subset to serve as a starting point for users wishing to build their own ZigBee Host applications. The application is configured to operate as a ZigBee Coordinator / Router. No ZigBee Cluster Library (ZCL) application-layer functionality is preconfigured. In the Studio New Project workflow Select Application dialog, it is recommended to select this sample application, rather than the "Start with a blank application" checkbox, to begin development of a new Zigbee Host application.

Z3GatewayGpComboHost and ncp-uart-hw-gp-multi-rail

A new set of Host (Z3GatewayGpComboHost) and NCP (ncp-uart-hw-gp-multi-rail) sample applications is added. This set demonstrates the use of the additional rail handle to send application-specific bidirectional GPDF from Combo to GPD.

1.4 New Platform Support

Added in release 6.8.1.0

Added support for the following boards and modules:

- BRD4311B / MGM220PC22HNA
- BRD4308C / MGM210PB32JIA
- BRD4308D / MGM210PB22JIA
- BRD4309B

Added in release 6.8.0.2

Added support for the following boards:

- BRD4180B
- BRD4181B
- BRD4181C
- BRD4184A

2 Improvements

The buffer system used by the Silicon Labs Zigbee stack and applications has changed in release 6.8.0.0. Typical ZNet applications do not use the buffer system directly, so no changes should be needed. For applications that do use buffers directly, refer to the Buffer System section under 2.2 API Changes for more information.

2.1 Plugin Changes

Changed in release 6.8.0.2

Reporting Table

- Added the option to enable "Expanded Reporting Table". This allows for Reporting Tables to store up to 1024 entries. Must be either a Host application or an EFR32 SoC with the NVM3 plugin enabled.
- "Standard" Reporting Table maximum size is reduced to 127 entries to better align with the limits of the token system and avoid inadvertent index collisions.
- Compile-time table overflow detection has been added. The compiler now validates the size of the Reporting Table and throws an error if the total size (Plugin option + Configured Defaults) exceeds the maximum allowed for your configuration.
- Reorganized reporting table structure to reduce scanning range to active entries, reducing execution time for initialization and adding/removing entries. Note, due to the new structure, entry indicies are no longer constant, so applications that tracked the index of certain entries may need to be updated.
- Refactored the default configuration loading algorithm to significantly speed up the initialization process. Default configuration loading is now broken up into 2 steps. 1) Scan the Reporting Table to identify which default configurations already have entries saved. 2) Go through the remaining default configurations and append them to the table.
- Note: Although the expanded reporting table plugin option allows for a maximum of 1024 entries, hardware limitations may cause WDOG resets for large configurations. Additionally, the NVM3 configuration may need to be changed in order to accommodate a larger table including both number of flash pages and cache size. The default configuration of 18 flash pages is sufficient for 1024 entries, but more pages will increase lifetime.

Idle Sleep, MIcrium RTOS

Zigbee idle-sleep support is updated to use the underlying power manager platform support in both the bare metal and the kernel cases.

BLE

- Updated the BLE plugin to use Bluetooth API v3.
- Added new configurable options in the BLE plugin for the number of user advertisers and periodic advertising synchronization.
- Decreased the maximum number of connections from 10 to 8.
- Increased the malloc heap size by ~8 k to account for Bluetooth memory allocation changes in the new API.

See the Bluetooth SDK v3.0.0.0 release notes and API documentation for more information.

2.2 API Changes

Changed in release 6.8.1.0

The function signature, implementation, and invocations of emberAfAttributeValueSize() are modified to include an additional buffer size argument.

This buffer size argument is used to ensure that the buffer referenced by the buffer pointer argument is large enough to contain the specified ZCL non-string, string, or long string data value. This change provides additional protection against potential memory overrun due to malformed ZCL data values.

Changed in release 6.8.0.2

Function signature for emberOverrideAppendSourceRouteHandler() has been changed

Function signature for emberOverrideAppendSourceRouteHandler() has been changed to take a pointer to header. This is needed since the underlying buffer system in Zigbee has changed. Therefore, appending to a buffer can reposition it in the memory, and cause issues.

Buffer System

The system used to manage ZNet buffer memory has changed. The old system, "EmberMessageBuffer", used a fixed block size of 32 bytes and allocations longer than 32 bytes could be non-contiguous. Buffers were managed by reference counting, so the user needed to call emberReleaseMessageBuffer() to allow the memory to be reused.

In the new system, a "Buffer", allocates variable sized contiguous blocks, which are managed by a mark/sweep garbage collector. Any consumer holding a reference to a Buffer must provide a marking function which will call the emMarkBuffer() callback on each buffer reference. Any buffers not marked by any marker function will be released. Note that the buffers are compacted during garbage collection, so the consumer must not access the buffer by any pointer outside of the same scope in which emGetBufferPointer() is called. Also note that extending any buffer other than the most recently allocated can also cause the buffer to move. Buffers must be passed by reference to any function which may call emberAppendToLinkedBuffers().

Typical ZNet applications do not use the buffer system directly, so no changes should be needed. For applications that do use buffers directly, the only required porting should be to add the necessary marking function. All of the EmberMessageBuffer APIs are supported through the the legacy-packet-buffer.h header file.

2.3 Sample App Changes

Changed in release 6.8.0.2

Z3LightGPCombo

The Z3LightGPCombo has been modified to add the new multi-RAIL functionality by default. Note this plugin is optional.

DynamicMultiprotocolLight and DynamicMultiprotocolLightSed

DMP sample applications are updated to use Bluetooth API v3. Additionally, **DynamicMultiprotocolLight** has been updated to use Zigbee 3.0 security instead of Home Automation security.

2.4 Framework Changes

Changed in release 6.8.0.2

Unified MAC

This release includes a new implementation of the IEEE 802.15.4 MAC. The new implementation includes cleaner interfaces with better encapsulation and more flexibility, and lays the groundwork for future new features. All application public APIs are fully backward compatible, so no porting should be necessary. The more flexible underlying APIs will be made public in the future, allowing for greater customization and flexibility to implement additional features alongside standard Zigbee.

Platform Changes

- The size of ParserContext_t for Series-2 devices has been increased to 556 bytes.
- MbedTLS source code was upgraded to version 2.16.6 which fixes a side channel ECC vulnerability and an exploitable buffer overread in a DTLS client.
- Serial buffer mode on em35x was updated to use the new buffer system

2.5 Documentation Changes

Changed in release 6.8.0.2

EmberZNet Serial Protocol (EZSP)

The following EZSP CONFIG and VALUE IDs have had their descriptions revised in *UG100: EZSP Reference Guide* for greater clarity of use and/or opportunity for modification:

- EZSP_CONFIG_PACKET_BUFFER_COUNT
- EZSP_CONFIG_RETRY_QUEUE_SIZE
- EZSP_CONFIG_NEW_BROADCAST_ENTRY_THRESHOLD
- EZSP_VALUE_FREE_BUFFERS
- EZSP_VALUE_MAXIMUM_INCOMING_TRANSFER_SIZE
- EZSP_VALUE_MAXIMUM_OUTGOING_TRANSFER_SIZE
- EZSP_VALUE_DESCRIPTOR_CAPABILITY
- EZSP_VALUE_NEXT_HOST_REJOIN_REASON
- EZSP_VALUE_APS_FRAME_COUNTER
- EZSP_VALUE_NWK_KEY_TIMEOUT
- EZSP_VALUE_ACTIVE_RADIO_CONFIG
- EZSP_VALUE_MFGLIB_OPTIONS

3 Fixed Issues

Fixed in release 6.8.1.0

ID #	Description
460021	The serialized payload of the EZSP RemoteSetBindingHandler response message from NCP to Host is corrected to include the networkIndex field of the contained EmberBindingTableEntry. Previously, networkIndex was omitted from the serialization and the message payload was short by one byte.
463637	Fixed an issue where a legacy end device could exist in both child and neighbor table after association.
491280	NVM3 will now "disable execution" on the flash area used for data storage if the mpu component is included in the project. This is done to prevent unintentional program execution from a data area.
495580	During execution, the nvm3_repack function will do either nothing, copy data or erase a page. To limit the execution time, the copy part may now be split into several calls, where each call will never copy more than max-object-size number of bytes. This is done to limit the time when interrupts are disabled if the default locking functions are used.
498838	Fixed a bug that was causing incorrect point randomisation during ECC operations.
501006	EZSP_VALUE_TOKEN_STACK_NODE_DATA and EZSP_VALUE_UART_SYNCH_CALLBACKS ValueIDs are now readable (previously only writable). Additionally, a bug when writing EZSP_VALUE_TOKEN_STACK_NODE_DATA was found and corrected. The stack node data's Zigbee NodeId was being treated as an 8-bit rather than a 16-bit value, and subsequently a copy of the Extended PAN ID was improperly offset by one byte.
519432	Fixed an issue where calling TIMER_Reset for a disabled timer caused a bus fault for series 2 devices.

Fixed in release 6.8.0.2

ID #	Description
60975	EZSP_VALUE_END_DEVICE_KEEP_ALIVE_SUPPORT_MODE, previously writable only, is now also readable.
229938	Fixed a problem where Touchlink targets were incorrectly sending Device Information Response frames with the legacy 0xC05E ZLL profile ID in the sub-device records, rather than with the common 0x0104 HA/Z3 profile ID, even when the 'Profile Interop' bit was set in the Touchlink information field of the Touchlink initiator's scan request. The device information request handling is moved into the ZLL library, so that it is able to conveniently access the original scan request message.
341708	emAfWriteAttribute now uses emberAfAttributeValueSize instead of emberAfAttributeSize(metadata), which handles the size correctly.
426200	Enabling a large number of endpoints (~40) and setting a large reporting table entries (close to 255) no longer results in a watchdog reset during default config loading. See reporting table plugin changes above for more information.
438670	Provided an option to configure the address table size at compile-time on the NCP. This can be used to work around an issue where the GCC compiled XNCP application will assert whenever the host attempts to dynamically increase the size of the address table on the NCP. To use the workaround, set address table size on the NCP to the same value that the host is using.
449691	CRDSW: Fixed issue in em_i2c where the state machine sometimes issued a NACK after last byte was read in a slave to master transfer. This could cause issues when auto ack was enabled. After this fix the NACK is issued before the last byte is read in all state machine transitions.
450504	For the ZCL Groups cluster implementation in the groups-server plugin, support for group names is now properly indicated in the most significant bit of the NameSupport map8 attribute. Previously, the status was mistakenly indicated in the least significant bit.
453086	Fixed print formatting errors for ZCL Diagnostics Cluster attributes LastMessageLQI and LastMessageRSSI when the ZCL attribute table is printed in the CLI via the "print attr" command.
460275	Z3GatewayHost sample application now compiles on a Mac or Linux platform without path issues.
466744	CRDSW: In mbed TLS, the streaming interface of the SE GCM plugin (se_gcm.c for e.g. EFR32xG21) failed when applying one incomplete plaintext block and zero additional data.
479564	EZSP_VALUE_NWK_KEY_TIMEOUT has been made readable. Previously it was write only.

ID #	Description
482349	EMHAL: Fixed early rollover of halCommonGetInt32uMillisecondTick on EFR32 devices. It now once again rolls over at 2^32 milliseconds. Also fixed a bug in halCommonGetInt64uMillisecondTick that was limiting the return value to 32-bits. Due to time unit conversion, it still does not quite use the full 64-bit range. The maximum value, however, represents an uptime of millions of years.
485090	A fix was made, so that a broadcast ZDO mngt_leave_request is now dropped by the receiver.
485113	EMHAL: Fixed an issue which prevented Virtual UART input from working which was broken in Gecko SDK Suite 2.7.4 and later.
487177	Improved robustness of EZSP-SPI code to prevent errors that could occur in the presence of interrupt latency or high radio traffic.
487941	CRDSW: In mbed TLS, config-device-acceleration.h, does not turn on acceleration of ECC functions for series-2 devices when the user application has selected a curve which is not supported with hardware acceleration. This allows the application to use the software implementation of the curve. For example, the MBEDTLS_ECDH_COMPUTE_SHARED_ALT is not defined when MBEDTLS_ECP_DP_CURVE25519_ENABLED is selected and the device is EFR32MG21A (_SILICON_LABS_SECURITY_FEATURE == _SILICON_LABS_SECURITY_FEATURE_SE). Earlier the acceleration config options were unconditionally defined. For example, MBEDTLS_ECDH_COMPUTE_SHARED_ALT was always defined for EFR32MG21 devices, meaning that the software implementation was overridden by the acceleration plugin even if the plugin did not support the selected curve.
489360	EMHAL: A field for specifying LFXO precision has been added to hwconf files with a default of 500ppm to allow for custom precision values. This solves the issue where Zigbee/BLE DMP sleepy applications would not go into EM2 energy mode, despite selecting LFXO as the source of the LF clock, making the Bluetooth stack assume that the precision was insufficient to allow the unit to sleep and therefore caused the code to bottom out at energy mode EM1.
491025	Fixes a regression where a factory-new sleepy-end-device touchlink initiator fails to receive a Join End Device request after being preempted by a NFN initiator/target (such as another sleepy switch or a gateway router), due to its radio being off.
493503	Zigbee DMP sample applications have been updated to default to an HFCLK source of HFRCODPLL on EFR32xG21 devices to ensure the app runs at 80 MHz in order to avoid issues with switching between protocols.
497371	Fixed an issue in the DynamicMultiprotocolLight and DynamicMultiprotocolLightSed samples which prevented enabling the custom CLI commands of the sample code even if the option was globally enabled.
500875	An issue has been fixed where calling emberGetLibraryStatus with a libraryId parameter equal to or greater than EMBER_MULTI_NETWORK_LIBRARY_ID would return incorrect information.
501600	Processing of the Zigbee Cluster Library (ZCL) Write Attributes Undivided global command has been fixed to handle multiple attributes and to detect malformed commands.

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
60858	Sleepy broadcast payload is sometimes corrupted when relaying to child	No known 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	Lowest current is not achieved during sleep on lowest current during sleep on EFR32xG12, EFR32xG13, and EFR32xG14.	To achieve the lowest current during sleep on EFR32xG12, EFR32xG13, and EFR32xG14 parts, you must turn on voltage scaling. However, the radio will not operate with voltage scaling turned on, so to turn it on you must also make sure to disable it after each wake-up. Furthermore, some resets will not turn off voltage scaling, so please ensure that it is disabled before attempting to turn on the radio. Note that there is a ramp when turning voltage scaling on or off, so enabling this feature may increase the time it takes to go to sleep or wake up.
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
281231	Enabling Serial 3 or USB functionality on EM358x and EM359x may cause memory management faults and other errors. As EM358x and EM359x USB support has been deprecated, please ensure that Serial 3 and USB functionality are disabled.	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.profile 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.
301024	Currently the Dynamic Multi-Protocol Sample applications do not build with GCC, they require the IAR compiler due to dependencies on both the BLE and Micrium stacks.	No known workaround

ID #	Description	Workaround
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.
333146	The coexistence plugin behavior has changed to be required for all applications. By default coexistence functionality should be stubbed out when not configured via board header (EM35x) or not enabled via HWCONF (EFR32). Appbuilder may automatically enable the HWCONF coexistence module without warning which can trigger an error for dynamic multiprotocol applications, which do not yet support coexistence.	No known workaround
338151	Initializing NCP with a low packet buffer count value may cause corrupt packets.	No known workaround
345167	Sleepy end devices occasionally not sending APS ACK for received APS unicasts polled from parent.	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.
362133	The default chip RSSI offset on the EFR32 chips is incorrect. For accuracy, we recommend measuring this on your hardware and then applying it with the \ref RAIL_SetRssiOffset() API. In the future, more reasonable defaults will be provided, however, the board dependent component may still need to be measured for custom hardware.	Use RAIL_SetRssiOffset()
363162	There is a bug in emberAfAddAddressTableEntry which could allow for duplicate entries in the address table	Under Investigation
398694	Disabling endpoint 2 (Touchlink) in the Z3Light sample app causes high emberRunTask execution time.	Under Investigation
426066	OTA client could reset when it starts to apply the new image if all debug print is disabled.	No known workaround
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	After EmberZNet 6.6.0, joining and insecurely rejoining children are now subject to a new, temporary timeout EMBER_SHORT_CHILD_TIMEOUT. This defaults to 2 minutes if undefined and should be able to be overridden. However, it doesn't function as expected since defining and changing the value of EMBER_SHORT_CHILD_TIMEOUT doesn't take any effect. The short temporary timeout for the joining device will always stay as 2 minutes.	No known workaround
438993	Certain IRQ Pin/Port settings do not allow wake on interrupt in some EM3xx parts.	No known workaround

ID #	Description	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.
454936	**Z3Light and Z3Switch sample apps encounter a GPIO conflict between LEDs and buttons on module-based radio boards, like BRD4304x, BRD4305x, BRD4306x, BRD4308x, BRD4309x, BRD4311B.**	**Disable either buttons or LEDs in Hardware Configurator.**
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".
458128	When changing architecture to an ISC, the generation step might fail with a duplicate API implementation error. This happens when changing the platform of a sim-eeprom2 enabled application to an EM3xx device. This automatically enables the sim-eeprom1 but does not disable sim-eeprom2.	After changing the platform, ensure the correct sim-eeprom version is enabled and disable all other token storage plugins.
458566	The Enable EM1/EM2 option in the Micrium RTOS plugin is currently disabled for EFR32xG21 devices due to stability issues. Formerly ID# 451205.	No known workaround
465180	The Coexistence Radio Blocker Optimization item "Enable Runtime Control" may block proper Zigbee operation.	Optional 'Wi-Fi Select' Control of Blocker Optiomization should be left "Disabled".
466254	The iBeacon and Eddystone Bluetooth beacons are not sent out in the DynamicMultiprotocolLightSoc sample app due to the default advertising parameter in the initialization.	Add .bluetooth.max_advertisers =3, to the 'config' struct init in ble-interface.c
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.
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.

ID #	Description	Workaround
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.**
479760	EMHAL: Declaring uninitailized variables with NO_INIT(...) macro on MG21 platforms results in them being incorrectly placed in the .noinitegacy section rather than .noinitnew section.	Declare variable using VAR_AT_SEGMENT() macro, such as: VAR_AT_SEGMENT(NO_INIT(uint8_t myVariable), __NO_INIT__)
480336	EMHAL: SPI NCP sleep causes reset on NOP with Deep Sleep frame control set.	No known workaround
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.**	**No known workaround**
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.**
488977	**OTA of Series 2 will fail if gecko bootloader 1.10.3 is used.**	**No known workaround**
489814	Smart Energy devices should reject unencrypted ZCL requests with ZCL status of "Failure" rather than "Not Authorized" when the cluster requires APS encryption. This may lead to Zigbee device certification failures for Smart Energy devices.	No known workaround
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

ID #	Description	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).
501006	EZSP_VALUE_TOKEN_STACK_NODE_DATA, EZSP_VALUE_UART_SYNCH_CALLBACKS ValueIDs are writable but not readable.	No known workaround
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);`
		`}`

623079	**The API "emberChildCount" is not available in SDK version 6.8.**	**use the following source code:**
		
		`#ifdef emberChildCount`
		`#undef emberChildCount`
		`#endif`
		
		`extern EmberNetworkInfo* emNetworkDescriptor;`
		
		`uint8_t emberChildCount(void)`
		`{`
		`  return emNetworkDescriptor->panInfoData->endDeviceChildCount;`
		`}`

624189	**EZSP-SPI NCP initialization out of a boot sequence occasionally fails the first time.**	**Retry 1-2 more times for the NCP to respond to the startup handshake.**

5 Deprecated Items

Advanced Notice

Zigbee support – The upcoming Zigbee R23 specification will not be supported on any devices matching the following criteria:

- All EM35x devices
- Any devices with 256 kB flash or less [All wireless MCU families]

Reason: The Zigbee R23 specification will lead to increased flash requirements and introduce new security requirements that these devices cannot adequately support. In preparation for that, the next major release (expected June 2020) will be the last major release to support these devices. Customers are advised to start any new Zigbee developments using EFR32 series devices that exceed the criteria as listed above.

Maintenance Period: Critical bug fixes and security patches for the next major release implementing Zigbee specification R22 will continue to be made available for the lifetime of EM35xx series and wireless MCU devices with less than 256 kB, as specified by the wireless longevity commitment https://www.silabs.com/wireless/longevity-commitment

Deprecated in release 6.8.0.2

Network Steering Configured Key API

The "plugin network-steering pre-configured-key-set" CLI command and emAfPluginNetworkSteeringSetConfiguredKey API is deprecated in release 6.8.0.0 and should not be used anymore. Users that wish to use a configured key during network steering should instead add the desired key value into the transient key table before starting network steering. The EUI used for this key should be the wildcard EUI (FFFFFFFFFFFFFFFF).

6 Removed Items

Removed in release 6.8.0.2

- MSD bootloader binaries are no longer added to the GSDK package.
- Multi-network configuration is no longer supported on any 256k flash size devices (was previously available for EM357 and EFR32MG14).
- The EZSP command EZSP_OVERRIDE_CURRENT_CHANNEL has been removed. This command was a no-op on all architectures that support multi network functionality.

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 v6.8.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 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.

8 Legal

8.1 Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications.

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