




SILICON LABS 7.4.0.0 Zigbee EmberZNet SDK Software User Guide

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Zigbee EmberZNet SDK 7.4.0.0 GA Gecko SDK Suite 4.4

December 13, 2023

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):

7.4.0.0 released December 13, 2023



KEY FEATURES

Zigbee

- Zigbee R23 compliance
- Zigbee Smart Energy 1.4a compliance – production
- Zigbee GP 1.1.2 compliance – Alpha
- MG27 support – production
- Improved support for Secure Vault parts
- Sleepy support on NCP SPI (non-CPC) applications – Alpha

Multiprotocol

- Concurrent Listening support (RCP) – MG21 and MG24
- Concurrent Multiprotocol (CMP) Zigbee NCP + OpenThread RCP – production
- Dynamic Multiprotocol Bluetooth + Concurrent Multiprotocol (CMP) Zigbee and OpenThread support on SoC

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 TECH DOCS tab on <https://www.silabs.com/developers/zigbee-emberznet>. 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 9.40.1.

- 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 12.2.1, provided with Simplicity Studio.

The EZSP protocol version for this release is 0x0D.

New Items

This release of the Gecko SDK (GSDK) will be the last with combined support for all EFM and EFR devices, except for patches to this version as needed. Starting in mid-2024 we will introduce separate SDKs:

- The existing Gecko SDK will continue with support for Series 0 and 1 devices.
- A new SDK will cater specifically to Series 2 and 3 devices.

The Gecko SDK will continue to support all Series 0 and 1 devices with no change to the long-term support, maintenance, quality, and responsiveness provided under our software policy.

The new SDK will branch from Gecko SDK and begin to offer new features that help developers take advantage of the advanced capabilities of our Series 2 and 3 products.

This decision aligns with customer feedback, reflecting our commitment to elevate quality, ensure stability, and enhance performance for an exceptional user experience across our software SDKs.

New Components

New in release 7.4.0.0

- The “zigbee_direct_security_p256” and “zigbee_direct_security_curve25519” components have been added so that users can configure a specific Zigbee Direct security option.

Users are allowed to have multiple “zigbee_direct_security” components enabled on a Zigbee direct device (ZDD) application. In this case, the actual security option depends on the Zigbee Virtual Device (ZVD) configuration.

New APIs

New in release 7.4.0.0

- Added a new API **sl_zigbee_token_factory_reset** to reset Zigbee NVM3 tokens to their default value.
- Added the API **bool sl_zigbee_sec_man_link_key_slot_available(EmberEUI64 eui)**, which returns true if the link key table can add or update an entry with this address (table is not full).

Added a new API **bool sl_zb_sec_man_compare_key_to_value (sl_zb_sec_man_context_t* context, sl_zb_sec_man_key_t* key)**, which returns true if the key being referenced by context has the same value as

the key supplied in the argument.

New Platform Support

New in release 7.4.0.0

- Zigbee stack support for the following new parts is added in this release: EFR32MG24A010F768IM40 and EFR32MG24A020F768IM40.

New Documentation

New in release 7.4.0.0

Updated the description for the Zigbee Secure Key Storage component to reflect the addition of Zigbee Secure Key Storage Upgrade (which adds backwards compatibility with existing projects).

Added a new application note for interacting with the Zigbee Security Manager group of components (AN1412: Zigbee Security Manager).

Intended Behavior

Users are reminded that Zigbee unsynchronized CSL transmissions are subject to protocol preemption at the radio scheduler. In the SleepyToSleepy applications, BLE can and will preempt a Zigbee CSL transmission, which will terminate the transmission. Scheduler preemption is more common for unsynchronized CSL, given that a potentially lengthy wake up frame sequence may be used. Users wishing to adjust transmission priorities may use the DMP Tuning and Testing component to do so. Users may also consult *UG305: Dynamic Multiprotocol User's Guide* for more information.

Improvements

Changed in release 7.4.0.0

emberCounterHandler API Doc Changes

In previous versions, the Counter Handler callback for MAC and APS layer EmberCounterTypes concerning packet RX and TX was not being passed the passing proper target node ID or data arguments, and API documentation concerning behavior of certain counters that used these parameters was unclear or misleading.

While the signature of emberCounterHandler() has not changed, the way its parameters are populated have changed slightly.

- Comments around EmberCounterType enums in ember-types.h have been expanded for clarity.
- The Node ID parameter to the Counter Handler for TX-related counters now checks whether the destination address mode indicates a valid short ID before using it. (If not, no destination address is populated, and a placeholder value of EMBER_UNKNOWN_NODE_ID is used instead.)
- The Node ID parameter to the Counter Handler for RX-related counters now reflects the source node ID, not the destination node ID.
- Retry count is *not* passed as the data parameter for EMBER_COUNTER_MAC_TX_UNICAST_SUCCESS/FAILED counters as described in ember-types.h in previous versions, but this was never properly

populated in previously released versions so its value in previous releases would always have been 0. This behavior has been clarified in the description of those EmberCounterTypes. However, the Retry count for APS layer retries continues to be populated in the data parameter for EMBER_COUNTER_APS_TX_UNICAST_SUCCESS/FAILED counter types, to be consistent with prior releases.

- All counters that populate the Node ID or data parameter for the callback have been audited to ensure they pass the expected data, address, or EMBER_UNKNOWN_NODE_ID, if a Node ID was expected but could not be obtained from the packet, as described in the revised ember-types.h documentation.
- The Counter handler for EMBER_COUNTER_MAC_TX_UNICAST_RETRY now correctly reflects the MAC layer destination node ID and number of retries in its Destination Node ID and data parameters.
- The Counter handler for EMBER_COUNTER_PHY_CCA_FAIL_COUNT now provides destination node ID information through the Node ID parameter about the intended MAC layer target of the message that failed transmission.

Updated Green Power Code

Green power server code is updated with various improvements including:

- Added more validation code for incoming commands with invalid endpoint when receiving on the GP server.
- Added code to handle the case when there is no more space to build green power messages.
- The sink now drops pairing configuration with action remove pairing in some cases per spec section A.3.5.2.4.1.
- The sink now saves the existing group list of an entry before removing when processing Pairing Configuration with action extend.
- The Translation query command returns “NOT FOUND” as the error code when the translation table is empty or the index is bigger than number of entries in the table.
- Changed the version of GP endpoint in some apps from 1 to 0.

Using CSMA in the GPDF Send function is restricted because Green Power Devices are minimal energy devices and do not use CSMA in most of the designs. Instead, the preferred design is to send out multiple packets using the same energy budget.

Removed the use of a hidden endpoint in the Green Power Server plugin option. Use one of the application endpoints instead.

Network Key Update Plugin Code Improvements

- Changed the periodic network key update period to be as long as 1 year.

Restructured Some APIs to Avoid Unnecessary Key Export

Made changes to favor the use of key contexts over plaintext key data.

- sl_zigbee_send_security_challenge_request now takes in an sl_zb_sec_man_context_t argument in place of EmberKeyData.
- The sl_zb_sec_man_derived_key_type enum's values are now a 16-bit bitmask to directly support certain key

derivations that combine multiple derived types.

Fixed Issues

Fixed in release 7.4.0.0

ID #	Description
1019348	Fixed the dependency requirements for the Zigbee ZCL Cli component so that it can be removed when not needed.
1024246	Updated the function description for emberHaveLinkKey() and sl_zb_sec_man_have_link_key().
1036503	Added a description to recommend use of the Micrium Kernel for DMP sample apps.
1037661	An issue that was preventing the application to install either pro stack or leaf stack has been fixed.
1078136	Fixed an intermittent crash when modifying events from interrupt context

1081548	<p>Users are reminded that Zigbee unsynchronized CSL transmissions are subject to protocol preemption at the radio scheduler. In the SleepyToSleepy applications, BLE can and will preempt a Zigbee CSL transmission, which will terminate the transmission. Scheduler preemption is more common for unsynchronized CSL, given that a potentially lengthy wake up frame sequence may be used. Users wishing to adjust transmission priorities may use the DMP Tuning and Testing component to do so. Users may also consult UG305: Dynamic Multiprotocol User's Guide for more information.</p> <p>An issue has been fixed in CSL where a new wake up frame sequence that is received immediately following a previous payload frame would not be recorded correctly. This would result in a missed payload frame.</p>
1084111	Initial sleepy SPI-NCP support for MG24 based boards are updated as part of this release.
1104056	Added support for network-steering to run on secondary network in case of multi-network
1120515	Fixed an issue where the channel did not change when using the mfglib set-channel command.
1141109	Fixed an issue that caused the generated sample application ncp-uart-gp-multi-rail to miss some header files when using the Green Power adapter component with the -cp option.
1144316	Updated the description of some data structure types in gp-types.h documentation.
1144884	Fixed spurious frame pending bit set when there is no data pending.

1 1 5 2 5 1 2	Fixed a potential crash in low-mac-rail when modifying the event in isr context.
1 1 5 4 6 1 6	Added an exception for the condition to initialize the network with the case “Switching role from Sleepy End device to Non-sleepy End device”.
1 1 5 7 2 8 9	Fixed an issue that may cause BDB test failure DN-TLM-TC-02B.
1 1 5 7 4 2 6	Fixed a build issue when building zigbee_simple_app with green_power_adapter component.
1 1 5 7 9 3 2	Added a condition to check if the “transition time” field is missing and set a default value 0xFFFF for this missing field.
1 1 6 6 3 4 0	Fixed an issue that was preventing the emberAfGpdsend from sending out the intended number of repeated transmissions.
1 1 6 7 8 0 7	Fixed an issue where devices acting as Trust Centers in distributed networks would incorrectly clear their transient link keys each time a new device joined.

1 1 6 9 5 0 4	Fixed an issue that caused reset of a sleepy device upon force wake up.
1 1 6 9 9 6 6	Fixed missing return value validation in buffer allocation code.
1 1 7 1 4 7 7 , 1 7 2 2 7 0	With mfglib start 1 no messages are transmitted but received, so the displayed terminal message “mfglib send complete” is wrong and changed to “RXed %d packets in the last %d ms”.
1 1 7 1 9 3 5	Changed the periodic network key update period to be as long as 1 year.
1 1 7 2 7 7 8	Added the missing invocation of the emberAfPluginGreenPowerServerUpdateAliasCallback to the Green Power server..
1 1 7 4 2 8 8	Fixed an issue that causes the network steering process to assert if a call to stop ongoing scan is called.

1 1 7 8 3 9 3	Updated a documentation error.
1 1 8 0 4 4 5	In Smart Energy, f OTA now continues to download if the Coordinator reaches Limited Duty Cycle.
1 1 8 5 5 0 9	Fixed an issue in CSL where a new wake up frame sequence that is received immediately following a previous payload frame would not be recorded correctly. This would result in a missed payload frame.

ID #	Description
1 1 8 6 1 0 7	Fixed an issue that caused the unsuccessful decryption of received GPDFs to replace the incoming GPDF in the gp commissioning notification.
1 1 8 8 3 9 7	Fixed an issue that caused a compilation error when enabling extended report table size.
1 1 9 4 0 9 0	Corrected the failure status in the default response for Sink Commissioning Mode command – following section 3.3.4.8.2

1 1 9 4 9 6 3	Fixed an issue that memset the commissioningGpd structure before calling user callback emberAfGreenPowerServerPairingStatusCallback.
1 1 9 4 9 6 6	Fixed an issue where the endpoint and proxiesInvolved fields were not set with the Exit Commissioning action.
1 1 9 6 6 9 8	Fixed a spurious frame pending bit set when there was no data pending.
1 1 9 9 9 5 8	Added code to handle the case when there is no more space to build green power messages.
1 2 0 2 0 3 4	Fixed an issue where sl_zb_sec_man_context_t stack variable was not initialized correctly, causing joining with install code to fail.
1 2 0 6 0 4 0	Calling emberRemoveChild() during a secure rejoin attempt by an end device can potentially lead to an extra decrement of the Child Count, potentially leading to a Child Count of -1 (255), inhibiting end devices from joining/rejoining due to an indicated lack of capacity in the Beacon.
1 2 0 7 5 8 0	Child Table search functions within the stack are inconsistent in use of 0x0000 versus 0xFFFF for node ID return value representing invalid/empty entries, leading to problems checking for unused entries in APIs like emberRemoveChild().

1 2 1 0 7 0 6	Destination and PHY Index provided in EmberExtraCounterInfo struct as part of emberCounterHandler() may have been incorrect for MAC TX Unicast counter types.
1 2 1 1 6 1 0 1 2 1 2 5 2 5	Fixed an issue where Dynamic Multiprotocol applications crashed after enabling Secure Key Storage Upgrade component.
1 2 1 1 8 4 7	While the signature of emberCounterHandler() has not changed, the way its parameters are populated have changed slightly. Changes around this API is explained in section 2 above.
1 2 1 2 4 4 9	Outgoing Beacons were incorrectly categorized by the MAC layer, leading to emberCounterHandler() failing to catch these packets with the EMBER_COUNTER_MAC_TX_BROADCAST counter type and instead counting the Beacons with the EMBER_COUNTER_MAC_TX_UNICAST_SUCCESS counter type. That potentially resulted in unreliable values for the dest EmberNodeId parameter passed to the EmberCounterInfo struct
1 2 1 4 8 6 6	Sending data poll packet in certain high traffic configurations may result in a bus fault.
1 2 1 6 5 5 2	An issue that causes an assertion under busy traffic conditions is fixed.

1 2 1 6 6 1 3	Fixed an issue which led to an incorrect value of groupcast radius in the proxy table.
1 2 2 2 5 0 9	Router/coordinator sends a leave & rejoin request to a non-child polling end device, but the MAC destination is 0xFFFF instead of matching the NWK destination address.
1 2 2 3 8 4 2	Fixed an issue with generation of the sl_component_catalog.h that was leaving unwanted code in it causing compilation failure.
7 5 6 6 2 8	Changed the invocation of application callback emberAfMacFilterMatchMessageCallback to only be called for the ZLL messages that are validated by the stack.
8 1 6 0 8 8	Moved EMBER configuration from zigbeed_configuration.h to zigbeed.slcp.
8 2 9 5 0 8	To avoid a race condition, additional validation was added in emberSetLogicalAndRadioChannel to return unsuccessful if the lower layers are busy or not in a state to change the channel.

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.silabs.com/developers/zigbee-emberznet> in the Tech Docs tab.

ID #	Description	Workaround
NA	<ul style="list-style-type: none"> The following apps/components is not supported in this release: EM4 support 	Feature will be enabled in subsequent releases.

1 9 3 4 9 2	emberAfFillCommandGlobalServerToClientConfigureReporting macro is broken. The filling of buffer creates incorrect command packet.	Use the “zcl global send-me-a-report” CLI command instead of the API.
2 7 8 0 6 3	Smart Energy Tunneling plugins have conflicting treatment/usage of address table index.	No known workaround
2 8 9 5 6 9	Network-creator component power level picklist doesn't offer full range of supported values for EFR32	Edit the range <-8..20> specified in the CMSIS comment for EMBER_AF_PLUGIN_NETWORK_CREATOR_RADIO_POWER in the <sdk>/protocol/zigbee/app/framework/plugin/network creator/config/network-creator-config.h file. For example, change to <-26..20>.
2 9 5 4 9 8	UART reception sometimes drops bytes under heavy load in Zigbee+BLE dynamic multiprotocol use case.	Use hardware flow control or lower the baud rate.
3 1 2 2 9 1	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.
3 3 8 1 5 1	Initializing NCP with a low packet buffer count value may cause corrupt packets.	Use the 0xFF reserved value for packet buffer count to avoid the too-low default value
3 8 7 7 5 0	Issue with Route Table Request for mats on end device.	Under Investigation

4 0 0 4 1 8	A touchlink initiator cannot link to a non-factory-new end device target.	No known workaround.
4 2 4 3 5 5	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
4 6 5 1 8 0	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".
4 8 0 5 5 0	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
4 8 1 1 2 8	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.

ID #	Description	Workaround
4 8 6 3 6 9	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.

4 9 5 5 6 3	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 attempting to join. This mode can be forced by the End Device Support plugin.
4 9 7 8 3 2	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
5 1 9 9 0 5 5 2 1 7 8 2	Spi-NCP may very rarely fail to start up bootloader communication using the 'bootload' CLI command of the ot-a-client plugin.	Restart the bootload process
6 2 0 5 9 6	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.
6 3 1 7 1 3	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.
6 7 0 7 0 2	Inefficiencies within the Reporting plugin can lead to significant latency based on data write frequency and table size, which may interfere with customer application code, including event timing.	If doing frequent writes, consider checking reporting conditions and sending reports manually rather than using the plugin.
7 0 8 2 5 8	Uninitialized value in groups-server.c via addEntryToGroupTable() can create a spurious binding and cause groupcast reporting messages to be sent.	Add "binding.clusterId = EMBER_AF_INVALID_CLUSTER_ID;" after "binding.type = EMBER_MULTICAST_BINDING;"

7 5 7 7 7 5	All EFR32 parts have a unique RSSI offset. In addition, board design, antennas and enclosure can impact RSSI.	When creating a new project, install the RAIL Utility, RSSI component. This feature includes the default RSSI Offset Silabs has measured for each part. This offset can be modified if necessary after RF testing of your complete product.
7 5 8 9 6 5	ZCL cluster components and ZCL command discovery table are not synchronized. Therefore, when enabling or disabling a ZCL cluster component, implemented commands will not be enabled/disabled in the corresponding ZCL Advanced Configurator command tab.	Manually enable/disable discovery for the desired ZCL commands in the ZCL Advanced Configurator.
7 6 5 7 3 5	The OTA update fails on Sleepy End Device with enabled Page Request.	Use Block Request instead of Page Request.
8 4 5 6 4 9	Removing CLI:Core component does not eliminate EEPROM cli calls to sl_cli.h.	Delete the eeprom-cli.c file that calls the sl_cli.h. Additionally, calls to sl_cli.h as well as sl_cli_command_arg_t in the ota-storage-simple-eeprom can be commented out.
8 5 7 2 0 0	ias-zone-server.c allows for a binding to be created with a "0000000000000000" CIE address and posteriorly does not allow further bindings.	No known workaround
1 0 1 9 9 6 1	Generated Z3Gateway makefile hardcodes "gcc" as CC	No known workaround

ID #	Description	Workaround
1039767	Zigbee router network retry queue overflow issue in multi thread RTOS use case.	<p>Zigbee Stack is not thread-safe. As a result, calling Zigbee stack APIs from another task is not supported in OS environment and may put the stack into “non-working” state. Refer to the following App note for more information and workaround using event handler.</p> <p>https://www.silabs.com/documents/public/application notes/an1322-dynamic-multiprotocol-bluetooth-zigbee-sdk 7x.pdf .</p>
1064370	The Z3Switch sample application only enabled one button (instance : btn1) by default that leads to mismatch in button description in the projectfile.	Workaround: Install the btn0 instance manually during Z3Switch project creation.
1161063	Z3Light and potentially other applications report incorrect cluster revision values.	Manually update the cluster revision attribute to their appropriate revision.
1164768, 1171479	ERROR: ezspErrorHandler s0x34 reported repeatedly during mfglib receive mode	<p>To reduce the error messages printed, configure EMBER_AF_PLUGIN_GATEWAY_MAX_WAIT_FOR_EVENT_TIMEOUT_MS on the host app to 100, so the callback queue is freed more quickly.</p>

Deprecated Items

Deprecated in release 7.4.0.0

Removed the following deprecated security APIs:

`emberGetKey()`

`emberGetKeyTableEntry()`

`emberSetKeyTableEntry()`

`emberHaveLinkKey()`

`emberAddOrUpdateKeyTableEntry()`

`emberAddTransientLinkKey()`

`emberGetTransientKeyTableEntry()`

`emberGetTransientLinkKey()`

`emberHmacAesHash()`

Use the APIs provided by Zigbee Security Manager for access to key storage and HMAC hashing.

Removed Items

Removed in release 7.4.0.0

- Removed duplicate public APIs in public header file `gp-types.h`.
- The `zigbee_end_device_bind` component has been removed. This component was used for the coordinator to broker binding requests for end devices. This optional functionality was removed from R22 of the Zigbee core spec.
- Removed `setPacketBufferCount()` in `af-host.c` and useless check case `EZSP_CONFIG_PACKET_BUFFER_COUNT`: in `command handlers.c`.
- Removed `memoryAllocation` argument because there is no need to divide into two phases when initializing NCP.
- Removed `emberAfNcpInitCallback()` in `se14-comms-hub`, `se14-ihd`, and `se14-meter-gas` 's `app.c`.
- Removed setting `EZSP_CONFIG_RETRY_QUEUE_SIZE` value during ncp initialization in `ncp-configuration.c`

Multiprotocol Gateway and RCP

New Items

Added in release 7.4.0.0

Concurrent listening, the ability for the Zigbee and OpenThread stacks to operate on independent 802.15.4 channels when using an EFR32xG24 or xG21 RCP, is released. Concurrent listening is not available for the 802.15.4 RCP/Bluetooth RCP combination, the Zigbee NCP/OpenThread RCP combination, or for the Zigbee/OpenThread system-on-chip (SoC). It will be added to those products in a future release.

The OpenThread CLI vendor extension has been added to the OpenThread host apps of multiprotocol containers. This includes the coex cli commands.

Improvements

Changed in release 7.4.0.0

The Zigbee NCP/OpenThread RCP multiprotocol combination is now production quality.

Fixed Issues

Fixed in release 7.4.0.0

ID #	Description
1081828	Throughput issue with FreeRTOS-based Zigbee/BLE DMP sample applications.
109090921	Z3GatewayCpc had trouble forming a network in a noisy environment.
1153055	An assert on the host was caused when there was a communication failure when reading the NCP version from the zigbee_ncp-ble_ncp-uart sample app.
1155676	The 802.15.4 RCP discarded all received unicast packets (after MAC acking) if multiple 15.4 interfaces shared the same 16-bit node ID.

1 1 7 3 1 7 8	The host falsely reported hundreds of packets received with mfglib in the Host-RCP setup.
1 1 9 0 8 5 9	EZSP error when sending mfglib random packets in the Host-RCP setup.
1 1 9 9 7 0 6	Data polls from forgotten end device children were not properly setting a pending frame on the RCP to queue a Leave & Rejoin command to the former child.
1 2 0 7 9 6 7	The “mfglib send random” command was sending out extra packets on Zigbeed.
1 2 0 8 0 1 2	The mfglib rx mode did not update packet info correctly when receiving on the RCP.
1 2 1 4 3 5 9	The coordinator node crashed when 80 or more routers tried to join simultaneously in the Host-RCP setup.
1 2 1 6 4 7 0	After relaying a broadcast for address mask 0xFFFF, a Zigbee RCP acting as a parent device would leave the pending data flag set for each child. This resulted in each child staying awake expecting data after each poll, and required some other pending data transaction to each end device to eventually clear this state.

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.silabs.com/developers/gecko-software-development-kit>.

ID #	Description	Workaround
811732	Custom token support is not available when using Zigbeed.	Support is planned in a future release.
937562	Bluetoothctl 'advertise on' command fails with rcp-uart 802154-blehci app on Raspberry Pi OS 11.	Use btmgmt app instead of bluetoothctl.

ID #	Description	Workaround
1022972	Coex not working on ZB NCP + OT RCP.	Support is planned for a future release.
1074205	The CMP RCP does not support two networks on the same PAN id.	Use different PAN ids for each network. Support is planned in a future release.
1122723	In a busy environment the CLI may become unresponsive in the z3-light _ot-ftd_soc app.	No known workaround.
1170052	CMP Zigbee NCP + OT RCP and DMP Zigbee NCP + BLE NCP may not fit on 64KB and lower RAM parts in this current release.	64KB parts not currently supported for these apps.
1213701	RCP may fail to indicate pending data for sleepy child during OTA upgrade to child in a noisy environment, resulting in update process terminating unexpectedly.	Will be addressed in a future release.
1221299	Mfglib RSSI readings differ between RCP and NCP.	Will be addressed in a future release.

Deprecated Items

None

Removed Items

Removed in release 7.4.0.0

The "NONCOMPLIANT_ACK_TIMING_WORKAROUND" macro has been removed. All RCP apps now by default support 192 µsec turnaround time for non-enhanced acks while still using 256 µsec turnaround time for enhanced acks required by CSL.

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 *QSG180: Z Zigbee EmberZNet Quick-Start Guide for SDK 7.0 and Higher*, for instructions on configuring your development environment, building and flashing a sample application, and documentation references pointing to next steps.

Installation and Use

The Zigbee EmberZNet SDK is provided as part of the Gecko SDK (GSDK), the suite of Silicon Labs SDKs. To quickly get started with the GSDK, install [Simplicity Studio 5](#), which will set up your development environment and walk you through GSDK installation. Simplicity Studio 5 includes everything needed for IoT product development with Silicon Labs devices, including a resource and project launcher, software configuration tools, full IDE with GNU toolchain, and analysis tools. Installation instructions are provided in the online [Simplicity Studio 5 User's Guide](#).

Alternatively, Gecko SDK may be installed manually by downloading or cloning the latest from GitHub. See https://github.com/SiliconLabs/gecko_sdk for more information.

Simplicity Studio installs the GSDK by default in:

- (Windows): C:\Users\<NAME>\SimplicityStudio\SDKs\gecko_sdk
- (MacOS): /Users/<NAME>/SimplicityStudio/SDKs/gecko_sdk

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/>.

Security Information

Secure Vault Integration

For applications that choose to store keys securely using the Secure Key Storage component on Secure Vault-High parts, the following table shows the protected keys and their storage protection characteristics that the Zigbee Security Manager component manages.

Wrapped Key	Exportable / Non-Exportable	Notes
Network Key	Exportable	
Trust Center Link Key	Exportable	
Transient Link Key	Exportable	Indexed key table, stored as volatile key
Application Link Key	Exportable	Indexed key table
Secure EZSP Key	Exportable	
ZLL Encryption Key	Exportable	
ZLL Preconfigured Key	Exportable	
GPD Proxy Key	Exportable	Indexed key table
GPD Sink Key	Exportable	Indexed key table
Internal/Placeholder Key	Exportable	Internal key for use by Zigbee Security Manager

Wrapped keys that are marked as “Non-Exportable” can be used but cannot be viewed or shared at runtime.

Wrapped keys that are marked as “Exportable” can be used or shared at runtime but remain encrypted while stored in flash.


User applications never need to interact with the majority of these keys. Existing APIs to manage Link Key Table keys or Transient Keys are still available to the user application and now route through the Zigbee Security Manager component.

Some of these keys may become non-exportable to the user application in the future. User applications are encouraged to not rely on the exporting of keys unless absolutely necessary.

For more information on Secure Vault Key Management functionality, see [AN1271: Secure Key Storage](#).

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.


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☐ Wireless

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☐ Wi-Fi

☐ ZigBee and Thread

☐ 2-Wire

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>.

Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



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Documents / Resources

	<p>SILICON LABS 7.4.0.0 Zigbee EmberZNet SDK Software [pdf] User Guide</p> <p>7.4.0.0 Zigbee EmberZNet SDK Software, 7.4.0.0, Zigbee EmberZNet SDK Software, EmberZNet SDK Software, SDK Software, Software</p>
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References

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-  [Simplicity Studio - Silicon Labs](#)
-  [Software Developer Docs - Silicon Labs](#)
-  [Overview - latest - Simplicity Studio 5 Users Guide Silicon Labs](#)
-  [GitHub - SiliconLabs/gecko_sdk: The Gecko SDK \(GSDK\) combines all Silicon Labs 32-bit IoT product software development kits \(SDKs\) based on Gecko Platform into a single, integrated SDK.](#)
-  [Silicon Labs Community](#)
-  [Gecko Software Development Kit \(GSDK\) - Silicon Labs](#)

-  [EmberZNet PRO Zigbee Protocol Stack Software - Silicon Labs](#)
-  [Zigbee Wireless Mesh Networking - Zigbee Modules, Chips - Silicon Labs](#)
- [User Manual](#)

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