SILICON LABS Gecko SDK Suite Bluetooth Hardware and Software User Guide

Bluetooth® LE SDK 7.3.0.0 GA
Gecko SDK Suite 4.4
February 26, 2025

Contents

Gecko SDK Suite Bluetooth Hardware and Software

Silicon Labs is a leading vendor in Bluetooth hardware and software technologies used in products such as sports and fitness, consumer electronics, beacons, and smart home applications. The core SDK is an advanced Bluetooth 5.4-compliant stack that provides
all of the core functionality along with multiple API to simplify development. The core functionality offers both standalone mode, allowing a developer to create and run their application directly on the SoC, or in NCP mode, allowing for the use of an external host MCU.

These release notes cover SDK version(s):

7.3.0.0 GA released February 26, 2025
7.2.0.0 GA released October 23, 2024
7.1.2.0 GA released August 14, 2024
7.1.1.0 GA released May 2, 2024
7.1.0.0 GA released April 10, 2024
7.0.1.0 GA released February 14, 2024
7.0.0.0 GA released December 13, 2023

KEY FEATURES
Bluetooth

- New feature component bluetooth_feature_connection_analyzer provides the functionality to capture and analyze the RSSI of transmissions on a Bluetooth connection.

Multiprotocol

- Concurrent Listening support (RCP) – MG21 and MG24.
- Concurrent Multiprotocol (CMP) Zigbee NCP + OpenThread RCP – production quality.
- 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/bluetooth-low-energy**. Silicon Labs also strongly recommends that you subscribe to Security Advisories for up-to-date information. For instructions as well as notes on using Secure Vault features, or if you are new to the Silicon Labs Bluetooth SDK, see Using This Release.

Compatible Compilers:
IAR Embedded Workbench for ARM (IAR-EWARM) version 9.40.1.

- 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 12.2.1, provided with Simplicity Studio.

New Items

1.1 New Features
Added in release 7.3.0.0
GATT Client for ATT MTU Exchange Only
Added component bluetooth_feature_gatt_client_att_mtu_request_only. This component provides a minimal GATT Client to automatically initiate an ATT MTU exchange procedure when the GATT connection is open. This

component does not provide the GATT Client API. Use the GATT Server API sl_bt_gatt_server_set_max_mtu to set the maximum size of ATT MTU in the BLE Host Stack.

Components for Specific Connection roles

Added new components bluetooth_feature_connection_role_central and bluetooth_feature_connection_role_peripheral. These components provide support for a specific connection role. When an application includes bluetooth_feature_connection, the application should also include one or both of the role-specific components based on the application's needs. If the application includes only bluetooth_feature_connection, both connection roles will be supported for backwards compatibility.

Better Code Optimization in Bluetooth Security Manager

The Bluetooth security manager now automatically drops the central or peripheral state machine if either the bluetooth_feature_connec-tion_role_central or the bluetooth_feature_connection_role_peripheral component is not included, respectively, in the application.

Added in release 7.2.0.0

New Scanner Option

Added a new scanner option SL_BT_SCANNER_IGNORE_BONDING for use with sl_bt_scanner_set_parameters_and_filter command. If the application doesn't need the bonding information in advertisement reports, it can set this scanner option to avoid unnecessary searching of the bondings.

Large Accept List Size

Increased the maximum accept list size to 127 entries.

HCI Event filtering

Link Layer in HCI mode uses application supplied event filtering to filter events. This can be used to limit HCI event traffic sent to the host stack.

Added in release 7.1.0.0

Periodic Advertising TX Power Setting

The TX power setting on an advertising set is also applied to periodic advertising.

Added in release 7.0.0.0

Bluetooth Connection Analyzer

New feature component bluetooth_feature_connection_analyzer provides the functionality to capture and analyze the RSSI of transmissions on a Bluetooth connection.

1.2 New APIs

Added in release 7.0.1.0

ID #	Description
1245616	Introduce new ESL C library configurations: ESL_TAG_POWER_DOWN_ENABLE and ESL_TAG_POWER_DOWN_TIMEOUT_MIN. The shutdown timeout can be customized in the ESL Tag example project using these. The f eature can also be turned off completely.

Added in release 7.0.0.0

sl_bt_connection_analyzer_start command: Start to analyze another device's connection and report the RSSI measurements.

sl_bt_connection_analyzer_stop command: Stop analyzing another device's Bluetooth connection.

sl_bt_evt_connection_analyzer_report event: Triggered when packets transmitted on a connection are captured.

sl_bt_evt_connection_analyzer_completed event: Triggered when the operation of analyzing a connection is completed.

sl_bt_connection_get_scheduling_details command: Get parameters and next connection event scheduling details of a connection.

sl_bt_connection_get_median_rssi command: Get the RSSI value measured on a connection.

sl_bt_sm_resolve_rpa command: Find the identity address of a bonded device by a resolvable private address (RPA).

sl_bt_evt_connection_set_parameters_failed event: Triggered when the peer device rejected an L2CAP connection parameter update request.

ID #	Description
1203776	Introduce a new ESL C library event ID: ESL_LIB_EVT_PAWR_CONFIG. A PAwR configuration is now subject to a preliminary sanity check by the ESL C library before the configuration is set – if the check fails, the configuration is rejected.
1196297	Added support to HADM for arbitrary number of channels up to 80.
1187941	‘bt_abr_host_initiator’ now has the function to save the jsonl logfiles to a selected folder using the command argument ‘-d’. In case the parameter is empty or a non-valid path to a directory it will use the current working directory and inform the user.
1158040	Add quality metrics to HADM Initiator by displaying the calculated distance likeliness on the u ser interface.
1152853	New communication channel option added to NCP-host examples: SPI over Co-Processor C ommunication (CPC).
1108849	Python script create_bl_files.py introduced to merge the .bat and .sh scripts into one. New features compared to the old scripts: – helper and additional command arguments to select required configuration – interactive mode: in case some of the tools or files are missin this script will help you to set it up – generate compressed GBLs (both lzma and lz4 compression methods) – device logic handling for series-1 and series-2 devices

Improvements

2.1 Changed Items

Changed in release 7.0.1.0

ID #	Description
1231551	The parameter ‘start_time_us’of sl_bt_connection_analyzer_start() is changed from unsigned integer to signed integer because its value could be negative (indicating a time in the past).
1245597	BLE RCP examples now have hardware flow control enabled by default.
1246269	Improved ESL Tag average power consumption in Synchronized state by up to 11% with the d efault ESL AP PAwR parameters.

Changed in release 7.0.0.0

ID #	Description
1203109	Improved detection logic for ESLs that do not have a valid GATT configuration according to th e ESL Service specification. The new logic now prevents a number of false positive detections and the resulting exclusion of valid ESLs from the network.
1144612	cJSON third party library update from GitHub: **https://github.com/DaveGamble/cJSON** @co mmit: b45f48e600671feade0b6bd65d1c69de7899f2be (master)
1193924	Migrate BLE SDK examples to use either legacy_scanner API or extended_scanner API inste ad of the deprecated scanner API.
1177424	Opening the Component Library in Studio and selecting any of the components that come fro m app/bluetooth now shows a “Documentation” section under “Dependencies” and “Depende nts” sections with the content hosted on docs.silabs.com for that component.

2.2 Changed APIs

Changed in release 7.1.0.0

sl_bt_evt_system_resource_exhausted event: New parameter ‘num_message_allocation_failures’ is appended to the the parameter list for reporting a resource exhaustion situation that the system has run out of internal pre-allocated message items, and that the creation of an internal message has failed.

sl_bt_advertiser_set_tx_power command: The functionality is extended so that the TX power applies to periodic advertising as well.

Changed in release 7.0.0.0

None.

2.3 Intended Behavior

Changed in release 7.0.0.0

None.

Fixed Issues

Fixed in release 7.3.0.0

ID #	Description
1378000	Fixed an issue in the Link Layer task scheduler that, in certain scenarios, led to tasks not executed i n a chronological order.

Fixed in release 7.2.0.0

ID #	Description
1348090	Fixed an issue PAwR where Link Layer did not properly handle set subevent data which was sent to o late.
1358600	Fixed a live lock case if device runs out of memory exactly at the same time as disconnecting.

Fixed in release 7.1.2.0

ID #	Description
1279821	Fixed an issue in the Link Layer where the Periodic Advertiser did not include the TX power value in the periodic advertising packet when configured by the host.
1282707	If central device has lost bonding keys and peripheral has bonding confirmations enabled to allow re-bonding the connection, client supported features, settings, and subscriptions to notifications and indications are no longer erased.
1288445	Fixed an issue in the Link Layer where PAwR didn't properly notify host of failed transmits.
1295837	Fixed an issue that may lead to asserts during new peripheral connections. This issue only presents on Bluetooth SDK versions 7.1.1 and 8.0.0.
1296939	Fixed an issue in the Link Layer where not including the Connection component in certain projects may lead to a hard fault.
1297876	Optimized scanning on primary channels when receiving extended advertising with long auxiliary pointer.
1330263	Fixed an issue in the Link Layer that caused the PAwR advertiser to stop accepting subevent data setting from the host.

Fixed in release 7.1.0.0

ID #	Description
1247634	Fixed an issue that the GATT server may not respond to an ATT request if the memory for the response message cannot be allocated. This issue can happen when the device is scanning and advertising in parallel to the GATT connection in a busy environment where many devices are advertising and scanning simultaneously. This use case can cause the Bluetooth stack to run out of memory frequently and results in a GATT server failure if the configured buffer size for the stack (SL_BT_CONFIG_BUFFER_SIZE) is too small for the application use case.
1252462	Fixed an issue with scanner where coded extended advertisement packets are not received after forming connection with uncoded PHY.
1254794	Fixed a corrupted packet being sent when starting encryption, while concurrently streaming data in a noisy environment.
1256359	Reduced memory usage in ATT message processing. Now an ATT request, response, or status update message is delivered to the BGAPI layer without additional memory allocations.
1257056	Improved ESL C lib stability in case of unexpected link losses.
1257110	The customer-reported issue with the missing linker flag under msys2/mingw64 has been resolved.
1258764	Fixed an issue in the PAwR-aware connection scheduler that caused an undesired offset in the window offset field of the connection request packet.

ID #	Description
1262944	Fixed an issue that prevented the adaptive frequency hopping component from following the cooldown parameter configuration accurately.
1267946	Fixed a build issue of “bt_abr_ncp_initiator” for custom boards.
1268312	Fixed an issue in the PAwR-aware connection scheduler that caused some connections to overlap with the PAwR Sync Indication packet.
1275210	Fixed an issue that prevented PAwR-based connections from succeeding after an hour of operation with only the PAwR task running.

Fixed in release 7.0.1.0

ID #	Description
1222271	Fixed an issue in the Bluetooth link layer where PAwR would hang the task scheduler while trying to send a connection request just after another task got executed.
1231551	Fixed an issue in the Bluetooth Link Layer that incorrectly calculated the number of channels for upd ate with signed time offset in the connection-analyzer feature.
1232169	ABR applications can now be built for BG24 and MG24 parts.
1233996	Fixed a GATT compliance issue when the GATT client feature component does not present in the ap plication. The issue was that the Bluetooth stack responds to an ATT_HANDLE_VALUE_IND with a n error when the remote GATT server sends an unsolicited GATT Indication. This is now fixed so tha t the Bluetooth stack will respond with an ATT_HANDLE_VALUE_IND with ATT_HANDLE_VALUE_ CFM. This issue does not exist when the GATT client feature component presents in the application.
1236361	Fixed an issue in the Bluetooth link layer that caused the device to hard-fault when the pending conn ection creation was canceled just before connection indication packet had been transmitted.
1240181	Fixed an issue in the Bluetooth link layer that caused a legacy-directed (ADV_DIRECT_IND) advertis ement packet to have extra bytes and wrong length.
1245534	Fixed an issue in Bluetooth host stack for the Privacy feature that can cause bonding to fail if the re mote device changes its resolvable private address (RPA) and the RPA is resolved again before bon ding is completed.
1248834	Fixed an issue in the Bluetooth link layer that could cause the packet buffering mechanism to get stu ck when other BLE tasks, such as scanning, run simultaneously with the PAwR advertising task.
1249259	Fixed an issue in the Bluetooth link layer that the unmapped channel is not initialized for Channel Se lect Algorithm #1 in the connection-analyzer feature, which caused a variable delay to catch packet after the analyzing process starts.
1243489	Fixed potential memory leaks in ESL key library implementation.
1241153	Fixed an issue in the Simple Communication Interface (UART) component that occasionally caused data loss in NCP host (x86/x64) to NCP target (EFR32) communication, causing the ESL AP Python example to hang for no apparent reason during mass ESL deployment.
1253610	Fixed an issue that could potentially cause the ESL AP to get stuck in an endless connection attemp t to nearby advertising Unsynchronized ESLs that are bonded to other access points.
1231407	Fixed an incorrect erase condition on bt_app_ota_dfu startup. Now the flash storage reading and era se step have their own states, so it can be differentiated when erase is really executed or application OTA DFU started without erase.
1197438	Fixed an issue in setting flow control in NCP Host test example.

Fixed in release 7.0.0.0

ID #	Description
1077663	Fixed an issue that could cause some Bluetooth commands to return success without actually performing the command if an RTOS and the Bluetooth on-demand start component was used and the application issued a Bluetooth command while the Bluetooth stack was stopped.
1130635	Fixed an issue that could cause a crash on FreeRTOS if the Bluetooth on-demand start feature is used and the FreeRTOS timer task has been configured to have a lower priority than the Bluetooth tasks.
1164357	Updated the error code from insufficient_encryption to insufficient_authentication as specified in Bluetooth specification when GATT client tries to access GATT attribute which requires security and the connection is not bonded or encrypted.

ID #	Description
1170640	Fixed a race condition in GATT Client that the ATT MTU exchange could be prevented if the user application calls a GATT Client command that in turn starts a GATT procedure with the remote GATT Server under the context of sl_bt_evt_connection_opened event handling in SoC mode.
1180413	Fixed an issue that could cause thread priority inversion and decrease Bluetooth connection reliability with FreeRTOS if the FreeRTOS timer task has been configured to have a lower priority than the Bluetooth tasks.
1192858	Improved advertisement report handling over the HCI interface. Now it is possible to configure maximum number of queued advertisement reports. This improves performance over slow HCI connection.
1196365	Fixed an issue seen with DTM when watchdog timer component presents.
1196429	Optimized connection establishment in a DMP configuration. In certain cases the packet was not processed fast enough which caused connection loss.
1198175	Fixed PAwR scanner window widening calculation after missed subevent packet. Add PAwR response slot window widening calculation to advertiser device. The fix is available in Bluetooth SDK 6.2.0 and newer.
1206647	Fixed a bug in the Bluetooth link layer that was caused by incorrect handling an error if the transmission of the connection indication packet by the central failed.
1209154	Fixed a bug that could prevent the demo mode from working more than once in an ESL AP session. The AP Pyhon sample code now does not allow changing the mode while the EFR Connect application is connected in demo mode, and it is now possible to query the current state of the demo via the CLI interface.
1212515	Fixed an issue in the RCP mode that made the LE_Set_Periodic_Advertising_Subevent_Data HCI command erroneously fail when data for multiple subevents was set at the same time with certain lengths. Fix another issue in the RCP mode that allowed indefinitely reserving an unusable connection handle when the Host did not wait for the Connection Complete HCI event before calling another LE_Create_Connection command.

1215158	PAwR subevent data requesting-setting procedure now follows the core specification strictly. Data provided by the host will be sent in the given order and data arriving too late will not be sent in the forthcoming periodic advertising interval.
1216550	Fixed a bug in command sl_bt_gatt_server_send_user_read_response that the GATT server may add more than ATT MTU – 4 number of bytes as the characteristic value in the read response to opcode ATT_READ_BY_TYPE_REQ. The documentation of this command is also fixed that the maximum number of bytes in response to opcode ATT_READ_BY_TYPE_REQ is ATT MTU – 4.
1218112	Fixed a race condition between the connection termination and channel map update procedure that could cause a double buffer free.
1223155	Fixed a memory access violation in the host stack when processing the HCI_LE_Read_Remote_Features_Complete event if the connection handle in the event is invalid.
1218866	Bluetooth RAIL DMP – SoC Empty FreeRTOS/Micrium OS Sample Apps are now available for xG28 (BRD4400A/B/C, BRD4401A/B/C).
1214140	BLE ESL examples now support BRD4402B and BRD4403B boards.
1212633	Fixed iop_create_bl_files.sh script failure on MacOS.
1209154	Fixed a bug that could prevent the ESL demo mode from working more than once in an AP session. The AP Python sample code now does not allow changing the mode while the EFR Connect application is connected in demo mode, while it is now possible to query the current state of the demo via the CLI interface.
1205333	Eliminated the need to manually change the type of UART flow control after creating the ESL AP NCP project for numerous supported boards.
1205317	The Silabs vendor specific 0x1F opcode for the ESL experimental PAwR interval skip function has been added to the ESL AP readme document.
1192305	Added a configurable delay to In-Place OTA DFU component before closing the connection with the Central device. This resolves the procedure's issues with In-Place OTA transfer and the latest EFR Connect v2.7.1 or later.
1225207	Fixed issue: NULL dereferencing can occur in ESL C lib which leads to ESL AP to crash in while configuring large networks.
1223186	Corrected app_timer for OS to apply ceiling of the requested value based on OS timer frequency to operate in the same way as bare-metal variant. Extended documentation that describes the limitations on resolution and mentions OS timer frequency configuration parameters that can be set to modify the timer frequency (and the resolution).
1203408	Application OTA DFU may enter an incorrect state if the application sends an sl_bt_evt_gatt_server_user_write_request_id event.
1208252	Initiator now closes connection at exit.
1180678	Stability improvements.

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/bluetooth-low-energy** in the Tech Docs tab.

ID #	Description	Workaround
361592	The sync_data event does not report TX power.	None
368403	If setting CTE interval to 1, a CTE request should be sent in every connection interval. But it is sent only i n every second connection interval.	None
641122	The Bluetooth stack component does not provide a c onfiguration for RF antenna path.	This is an issue specifically for BGM210P. O ne workaround is to manually update the co nfiguration in sl_bluetooth_config.h in text e dit mode. If the OTA with Apploader is used, include th e bluetooth_feature_ota_config component i n application project. Call command sl_bt_ot a_set_rf_path() to set the RF path for OTA m ode.
650079	LE 2M PHY on EFR32[B|M]G12 and EFR32[B|M]G1 3 doesn't work with smartphones using the Mediatek Helio chip due to an interoperability issue.	No workaround exists. For application devel opment and testing, the disconnection can b e avoided by disabling 2M PHY with sl_bt_c onnection_set_preferred_phy() or sl_bt_con nection_set_default_preferred_phy().
682198	The Bluetooth stack has an interoperability issue on t he 2M PHY with a Windows PC.	No workaround exists. For application devel opment and testing, the disconnection can b e avoided by disabling 2M PHY with sl_bt_c onnection_set_preferred_phy() or sl_bt_con nection_set_default_preferred_phy().
730692	4-7% packet error rate is observed on EFR32M|BG1 3 devices when RSSI is between -25 and -10 dBm. T he PER is nominal (as per the datasheet) both above and below this range.	None
756253	The RSSI value on a Bluetooth connection returned by the Bluetooth API is incorrect on EFR32M|B1, EF R32M|B12, EFR32M|B13, and EFR32M|B21 devices . On EFR32M|B21 devices. It is about 8~10 dBm hig her than the actual value, according to a measureme nt.	Install the "RAIL Utility, RSSI" component in the application project. This component prov ides a default RSSI offset for the chip that is applied at the RAIL level and can help to ac hieve more accurate RSSI measurements.
845506	When the Bluetooth_feature_afh component for AFH is included, the feature initialization always enables AFH.	To include the component but not to enable AFH at device boot, change the parameter v alue from 1 to 0 in the function call of sl_btct rl_init_afh() in sl_bt_stack_init.c.
1031031	Changing the configuration in the bt_aoa_host_locator application results in the applic ation crashing.	None
1227955	amazon_aws_soc_mqtt_over_ble and amazon_aws_soc_gatt_server examples don't a dvertise after booting up.	Increase configTIMER_TASK_STACK_DEP TH to 600 or above in config/FreeRTOSConfig.h in the project.

Deprecated Items

Deprecated in release 7.0.0.0
Command sl_bt_connection_get_rssi

Removed Items

Removed from release 7.0.0.0

ID #	Description
1219750	Python based HADM visualization script removed. Customers should use the Studio HADM GUI going forward.

Multiprotocol Gateway and RCP

7.1 New Items
Added in release 7.0.0.0
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.
7.2 Improvements
Changed in release 7.0.0.0
The Zigbee NCP/OpenThread RCP multiprotocol combination is now production quality. This sample application is not supported on Series-1 EFR devices.
7.3 Fixed Issues
Fixed in release 7.3.0.0

ID #	Description
1275378	Fixed an issue where calling emberRadioSetSchedulerPriorities() prior to emberInit() could result in a crash (Other ref: 1381882).
1361436	Fixed an issue that caused dmp_gp_proxy app (with CLI added) to fail to join a network on time.
1363050	Zigbee stack initialization no longer activates the radio (or RCP for host stacks) prior to stack APIs being called by the application. This prevents unwanted multi-PAN operation on Channel 11 (the default channel) when using a multi-PAN- capable RCP configuration.
1365665	Fixed an issue where the host would report receiving a packet with an invalid checksum on end-point 12. (Other ref: 1366154)
1392787	Fixed an issue that caused Zigbeed not restart when performing a Trust Center Backup and Restore Reset Node action.
1405226	Fixed project migration issue and included OT project upgrade rule to reflect newer SDK changes. Note that when customers upgrade their Multiprotocol project, files like app.c will need to be manually ported to reflect newer SDK changes.

Fixed in release 7.2.2.0

ID #	Description
1328799	The soft reset triggered by the Spinel RESET command now clears the buffers of the 15.4 RCP.
1337101	Incomplete 15.4 transmit operations (Tx waiting for an ack, Tx an ack in response to a message, etc) are no longer prematurely considered as failed upon radio interruption due to DMP. This allows said operation to be given a chance to be rescheduled after the interruption or permanently failed by RAIL (scheduler status error events). (Other ref: 1339032)
1337228	In Zigbeed the halCommonGetInt32uMillisecondTick() tick API is now updated to use MONOTONIC clock, so that it does not get affected by the NTP in a host system. (Other ref: 1339032)

1346785	Fixed a race condition which could cause concurrent listening to be disabled on the 802.15.4 RCP when both protocols were transmitting simultaneously. (Other ref: 1349176)
1346849	Adding the rail_mux component to a project will now cause it to automatically build with the associated stack library variants. (Other ref: 1349102)

Fixed in release 7.1.2.0

ID #	Description
1184065	Reduced RAM footprint for zigbee_ncp-ot_rcp-spi and zigbee_ncp-ot_rcp_uart on MG13 and MG21.
1282264	Fixed an issue that could have interrupted radio transmit operations by clearing the transmit fifo prematurely causing underflow.
1292537	DMP Zigbee-BLE NCP application now properly showing up in Simplicity Studio UI. (Other ref: 1292540)
1230193	Fixed incorrect node type issue when joining network on end device. (Other ref: 1298347)
1332330	Fixed an issue where a 15.4+BLE RCP operating in an environment with heavy network traffic could occasionally encounter a race condition that would leave it unable to send messages up to CPCd until rebooting the device. (Other ref: 1333156)

Fixed in release 7.1.0.0

ID #	Description
1022972	Added coexistence plugin back to Zigbee-OpenThread NCP/RCP sample application.
1231021	Avoid an assert in OTBR that has been observed when joining 80+ zigbee devices by recovering the RCP rather than by passing unhandled transmit errors to the sub mac.
1249346	Addressed an issue where the RCP could incorrectly dequeue packets destined for the host, resulting in a parse error in the OTBR and unexpected termination.

Fixed in release 7.0.1.0

ID #	Description
1213701	zigbeed didn't allow a source match table entry to be created for a child if MAC indirect queue has data already pending for that child. This behavior could lead to application layer transactions between the child and some other device failing due to lack of APS Ack or app-layer response, most notably the disruption and unexpected termination of ZCL OTA Upgrades targeting the child device.
1244461	Source match table entry for child being could be removed despite messages pending.

Fixed in release 7.0.0.0

ID #	Description
1081828	Throughput issue with FreeRTOS-based Zigbee/BLE DMP sample applications.
1090921	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.
1173178	The host falsely reported hundreds of packets received with mfglib in the Host-RCP setup.
1190859	EZSP error when sending mfglib random packets in the Host-RCP setup.

ID #	Description
1199706	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.
1207967	The "mfglib send random" command was sending out extra packets on Zigbeed.
1208012	The mfglib rx mode did not update packet info correctly when receiving on the RCP.
1214359	The coordinator node crashed when 80 or more routers tried to join simultaneously in the Host-RCP setup.
1216470	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.

7.4 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.silabs.com/developers/gecko-software-development-kit**.

ID #	Description	Workaround
937562	Bluetoothctl ‘advertise on’ command fails with rcp -uart- 802154-blehci app on Raspberry Pi OS 11.	Use btmgmt app instead of bluetoothctl.
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.
1124140	z3-light_ot-ftd_soc sample app is not able to form the Zigbee network if the OT network is up already.	Start the Zigbee network first and the OT network after.
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. (Other ref: 1393057)	64KB RAM parts are not recommended for NCP + RCP apps.
1209958	The ZB/OT/BLE RCP on MG24 can stop working after a few minutes when running all three protocols.	Will be addressed in a future release.
1221299	Mfglib RSSI readings differ between RCP and NCP.	Will be addressed in a future release.
1334477	Starting and stopping the BLE stack several times might result in the BLE stack not able to restart advertisement again on low RAM (64kB) Series 1 EFR devices in the DMP Zigbee-BLE sample application.	N/A

7.5 Deprecated Items
None
7.6 Removed Items
Removed in release 7.0.0.0
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

- Silicon Labs Bluetooth stack library
- Bluetooth sample applications

For more information about the Bluetooth SDK see **https://docs.silabs.com/bluetooth/latest/** . If you are new to Bluetooth see UG103.14: Bluetooth LE Fundamentals.

8.1 Installation and Use
The Bluetooth 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

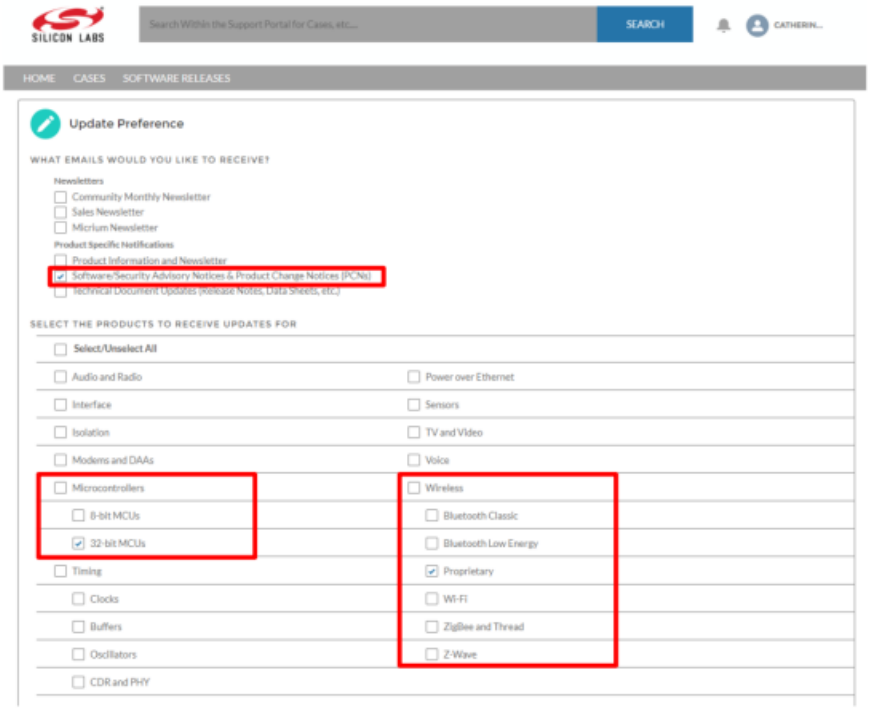
Documentation specific to the SDK version is installed with the SDK. Additional information can often be found in the knowledge base articles (KBAs). API references and other information about this and earlier releases is available on **https://docs.silabs.com/**.

8.2 Security Information
Secure Vault Integration
When deployed to Secure Vault High devices, sensitive keys such as the Long Term Key (LTK) are protected using the Secure Vault Key Management functionality. The table below shows the protected keys and their storage protection characteristics.

Wrapped Key	Exportable / Non-Exportable	Notes
Remote Long Term Key (LTK)	Non-Exportable	
Local Long Term Key (legacy only)	Non-Exportable	
Remote Identity Resolving Key (IRK)	Exportable	Must be Exportable for future compatibility reasons
Local Identity Resolving Key	Exportable	Must be Exportable because the key is shared with other devices.

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.
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.
The following figure is an example:



8.3 Support

Development Kit customers are eligible for training and technical support. Use the Silicon Labs Bluetooth LE web page to obtain information about all Silicon Labs Bluetooth 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!

IoT Portfolio	SW/HW	Quality	Support & Community
www.silabs.com/IoT	www.silabs.com/simplicity	www.silabs.com/quality	www.silabs.com/community

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. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliabilit y reasons. Such changes will not alter the specifi cations or the per formance of the product. Silicon Labs shall have no liabilit y for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required or Life Support Systems without the specific written consent of Silicon Labs. A “Life Support System” is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

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Documents / Resources

	SILICON LABS Gecko SDK Suite Bluetooth Hardware and Software [pdf] User Guide 7.3.0.0, 7.2.0.0, 7.1.2.0, Gecko SDK Suite Bluetooth Hardware and Software, Suite Bluetooth H ardware and Software, Bluetooth Hardware and Software, Software

References

- Software Developer Docs - Silicon Labs
- Silicon Labs
- Silicon Labs Community
- IoT – Internet of Things - Silicon Labs

- Simplicity Studio - Silicon Labs
- Technical Support - Silicon Labs
- Software Developer Docs - Silicon Labs
- User Manual