



Bluetooth® Mesh SDK 6.1.5.0 GA

Gecko SDK Suite 4.5

October 8, 2025

Bluetooth Mesh is a new topology available for Bluetooth Low Energy (LE) devices that enables many-to-many (m:m) communication. It is optimized for creating large-scale device networks and is ideally suited for building automation, sensor networks, and asset tracking. Our software and SDK for Bluetooth development supports Bluetooth Mesh and Bluetooth 5.3 functionality. Developers can add mesh networking communication to LE devices such as connected lights, home automation, and asset tracking systems. The software also supports Bluetooth beaconing, beacon scanning, and GATT connections so Bluetooth Mesh can connect to smart phones, tablets, and other Bluetooth LE devices.

This release includes features supported by the Bluetooth Mesh specification version 1.1.

Continued Software Support for Your Silicon Labs Devices

At Silicon Labs, we're committed to delivering dependable, well-supported software for all actively supported hardware products.

The GSDK 4.5 LTS is a long-term support release tailored specifically for **Series 0 and Series 1 devices** that are **not compatible with the Simplicity SDK**. This release ensures ongoing maintenance and stability for devices that are still in active use (i.e., not marked as NRND or EOL).

For customers using **Series 2 or Series 3 devices**, all new features and updates will be provided through the **Simplicity SDK**. To take advantage of the latest innovations and continued support, we encourage you to adopt or migrate to the most recent Simplicity SDK release.

If you have questions about migration or need help choosing the right SDK for your product, our support team is here to help.

These release notes cover SDK versions:

6.1.5.0 released October 8, 2025 (Underlying platform changes only)

Compatibility and Use Notices

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

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 9.40.1

Using wine to build with the larBuild.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.

Link-time optimization feature of GCC has been disabled, resulting in a slight increase of image size.



KEY FEATURES

- The GSDK 4.5 LTS is a long-term support release tailored specifically for Series 0 and Series 1 devices that are not compatible with the Simplicity SDK. This release ensures ongoing maintenance and stability for devices that are still in active use (i.e., not marked as NRND or EOL).
- Qualified implementation of Mesh 1.1
- Added Network Lighting Control (NLC) profiles

Contents

1 New Items 3

1.1 New Features 3

1.2 New APIs..... 4

2 Improvements..... 6

3 Fixed Issues 7

4 Known Issues in the Current Release 9

5 Deprecated Items 10

6 Removed Items 11

7 Using This Release..... 12

7.1 Installation and Use 12

7.2 Security Information..... 12

7.3 Support..... 13

1 New Items

The **GSDK 4.5 LTS** is a long-term support release tailored specifically for **Series 0 and Series 1 devices** that are **not compatible with the Simplicity SDK**. This release ensures ongoing maintenance and stability for devices that are still in active use (i.e., not marked as NRND or EOL).

For customers using **Series 2 or Series 3 devices**, all new features and updates will be provided through the **Simplicity SDK**. To take advantage of the latest innovations and continued support, we encourage you to adopt or migrate to the most recent Simplicity SDK release.

1.1 New Features

Added in release 6.0.1.0

Changes in SLC components:

A third BT Mesh Role was added beside Provisioner and Provisionee role – a Custom BT Mesh Role, where the application gets the freedom to implement a custom role. For example, the Provisioner or Provisionee role could be selected runtime.

Added in release 6.0.0.0

New Networked Lighting Control (NLC) example apps:

btmesh_soc_nlc_basic_lightness_controller for demonstration of the BT Mesh NLC Basic Lightness Controller Profile

btmesh_soc_nlc_basic_scene_selector for demonstration of the BT Mesh NLC Basic Scene Selector Profile

btmesh_soc_nlc_dimming_control for demonstration of the BT Mesh NLC Dimming Controller Profile

btmesh_soc_nlc_sensor_ambient_light for demonstration of the BT Mesh NLC Ambient Light Sensor Profile

btmesh_soc_nlc_sensor_occupancy for demonstration of the BT Mesh NLC Occupancy Sensor Profile (People count)

Changes in example apps:

btmesh_soc_sensor_server was deleted and its functionality was split in 3 examples:

btmesh_soc_sensor_thermometer for demonstration of Sensor Server Model with a thermometer

btmesh_soc_nlc_sensor_occupancy for demonstration of the BT Mesh NLC Occupancy Sensor Profile (people count)

btmesh_soc_nlc_sensor_ambient_light for demonstration of the BT Mesh NLC Ambient Light Sensor Profile

btmesh_soc_switch was renamed to **btmesh_soc_switch_ctl**, whose purpose is to demonstrate the usage of the Light CTL Client Model. The example no longer controls scenes (Scene Client)

btmesh_soc_light was renamed to **btmesh_soc_light_ctl**

The example no longer demonstrates the LC Server model and Scene Server, Scheduler Server and Time Server Models

btmesh_soc_hsl was renamed to **btmesh_soc_light_hsl**

The example no longer demonstrates the LC Server model and Scene Server, Scheduler Server and Time Server Models

Changes in all example apps:

DFU image updates are generated by a Python script instead of create_bl_files.bat/sh files

Support for Mesh Composition Data Pages 1, 2, 128, 129, 130 was added for all examples, these pages are automatically generated by the BT Mesh Configurator tool.

New SLC components:

btmesh_nlc_basic_lightness_controller for demonstration of the BT Mesh NLC Basic Lightness Controller Profile

btmesh_nlc_basic_lightness_controller_profile_metadata for Composition Data Page 2 NLC support for Basic Lightness Controller Profile

btmesh_nlc_basic_scene_selector for demonstration of the BT Mesh NLC Basic Scene Selector Profile

btmesh_nlc_basic_scene_selector_profile_metadata for Composition Data Page 2 NLC support for Basic Scene Selector Profile

btmesh_nlc_dimming_control for demonstration of the BT Mesh NLC Dimming Controller Profile

btmesh_nlc_dimming_control_profile_metadata for Composition Data Page 2 NLC support for Dimming Controller Profile

btmesh_nlc_ambient_light_sensor for demonstration of the BT Mesh NLC Ambient Light Sensor Profile

btmesh_nlc_ambient_light_sensor_profile_metadata for Composition Data Page 2 NLC support for Ambient Light Sensor Profile

btmesh_nlc_occupancy_sensor for demonstration of the BT Mesh NLC Occupancy Sensor Profile (People count)

btmesh_nlc_occupancy_sensor_profile_metadata for Composition Data Page 2 NLC support for Occupancy Sensor Profile

btmesh_generic_level_client_ext for extending the Generic Base component with Generic Move Unacknowledged and Generic Delta Unacknowledged messages

ncp_btmesh_ae_server for enabling the Silabs Configuration Server vendor model for the node to allow data transfer over Advertisement Extension

ncp_btmesh_ae_server for enabling the Silabs Configuration Client vendor model for the node.

ncp_btmesh_user_cmd for demonstrating the communication between an NCP host and NCP target using BGAPI user messages, responses and events.

1.2 New APIs

Added in release 6.1.0.0

BGAPI additions:

New commands have been added to the node class to associate scan response data with Mesh provisioning and Mesh proxy service advertisements. The scan response data associated with Mesh proxy service advertisements can be set individually for each network key, so it can contain data encrypted with that key, but it is up to the application to manage that. The new commands are:

sl_btmesh_node_set_proxy_service_scan_response: Set scan response data for proxy service advertisement

sl_btmesh_node_clear_proxy_service_scan_response: Clear scan response data for proxy service advertisement

sl_btmesh_node_set_provisioning_service_scan_response: Set scan response data for provisioning service advertisement

sl_btmesh_node_clear_provisioning_service_scan_response: Clear scan response data for provisioning service advertisement

A new command has been added to the vendor model class to set model behavior options. Currently there is one option that controls whether a work buffer is allocated from the heap for each vendor model for message reception reporting. The default value (1) allocates a buffer, which increases event reporting resilience when a device is under high load at the expense of additional heap memory usage. The new command is:

sl_btmesh_vendor_model_set_option: Set a vendor model behavior option

New commands have been added to the diagnostic class to report friendship-related events. The new commands are:

sl_btmesh_diagnostic_enable_friend: Enable generation of friendship-related diagnostic events
 sl_btmesh_diagnostic_disable_friend: Disable generation of friendship-related diagnostic events
 sl_btmesh_diagnostic_get_friend: Retrieve friendship-related diagnostic counters

New events added to the diagnostic class are as follows:

sl_btmesh_diagnostic_friend_queue: Event for message being added to friendship message queue
 sl_btmesh_diagnostic_friend_relay: Event for message being relayed to a LPN
 sl_btmesh_diagnostic_friend_remove: Event for message being removed from friendship message queue

Added in release 6.0.0.0

Changes in SLC components:

nbp_btmesh_dfu component's ncp_btmesh_dfu.h has a new API

```
void sl_btmesh_nbp_dfu_handle_cmd(void *data, bool *cmd_handled);
```

btmesh_provisioning_decorator component doesn't restart provisioning after provisioning is failed

btmesh_lighting_server's sl_btmesh_lighting_server.h has a new API

```
void sl_btmesh_update_lightness(uint16_t lightness, uint32_t remaining_ms);
```

btmesh_event_log has more granular configurability options

btmesh_ctl_client's sl_btmesh_ctl_client.h has an API change

instead of

```
void sl_btmesh_set_temperature(uint8_t new_color_temperature_percentage);
```

the new API is

```
void sl_btmesh_ctl_client_set_temperature(uint8_t temperature_percent);
```

```
void sl_btmesh_ctl_client_set_lightness(uint8_t lightness_percent);
```

BGAPI additions:

A new BGAPI class for device diagnostics has been added. It provides the application with Mesh stack statistics counters and an event-based reporting of network PDU relaying and proxying, which can be activated and deactivated as needed.

The BGAPI commands in the diagnostic class are:

sl_btmesh_diagnostic_init: Initialize the diagnostic component
 sl_btmesh_diagnostic_deinit: Deinitialize the diagnostic component
 sl_btmesh_diagnostic_enable_relay: Enable event-based reporting of network PDU relaying/proxying activity
 sl_btmesh_diagnostic_disable_relay: Disable event-based reporting of network PDU relaying/proxying activity
 sl_btmesh_diagnostic_get_relay: Get the number of relayed/proxied network PDUs so far
 sl_btmesh_diagnostic_get_statistics: Get mesh stack statistics counters
 sl_btmesh_diagnostic_clear_statistics: Zero mesh stack statistics counters

The BGAPI event in the diagnostic class is:

sl_btmesh_diagnostic_relay: Event reporting that a network PDU has been relayed or proxied by the stack

2 Improvements

Changed in release 6.1.0.0

The diagnostic class BGAPI command for retrieving statistics has been changed to retrieve chunks of data instead of retrieving all data at once. The caller should supply the size of the chunk it requests along with the offset of the chunk in the statistics data, and the call will return with as much data as can be supplied, given the request constraints.

Changed in release 6.0.0.0

A provisioner or a node can now configure itself using the configuration client model and its own primary address as the destination for the messages. This can replace self-configuration by test BGAPI commands.

Code optimization can result in slightly smaller firmware images than before, depending on the feature set used.

Code optimization can result in slightly smaller RAM usage than before, depending on the feature set used.

The Mesh stack no longer requires or supports the deprecated BLE advertiser and scanner components. Instead, it uses the current versions of each (legacy advertiser and legacy scanner for non-extended advertisements, and extended advertiser and extended scanner for extended advertisements). Applications that use both the BLE and the Mesh BGAPIs should no longer use the deprecated BLE advertiser and scanner components either.

3 Fixed Issues

Fixed in release 6.1.4.0

ID #	Description
1285133	Fixed a problem in Friend, acknowledging segmented data it received directly from its LPN.
1339163	Removed stale outgoing advertisements from Tx queue to help manage overload situations.
1344809	Fixed a configuration issue where device configuration was not sufficient with respect to load.
1356050	Improved the previous fix by eliminating unnecessary GATT service setup operations that could potentially fail.
1401801	Fixed Scene Server model initialization when the server was on something other than the primary element.

Fixed in release 6.1.3.0

ID #	Description
1331888, 1338088, 1338090	Fixed a number of unhandled memory allocation failures that could potentially lead to a crash when the device is overloaded with traffic.
1345827	Fixed loss of the informative DFU distributor BGAPI event for node removal.
1351464	Fixed link layer reporting of closing connections in an overload situation.
1354679	Optimized memory usage when sending legacy advertisements.
1356050	Fixed GATT proxy restarting issue when the underlying connection closes unexpectedly.

Fixed in release 6.1.2.0

ID #	Description
1251498	Fixed when a Lighting message, including transition time, leads to an incorrect error message in logs.
1284204	Fixed an issue that could prevent saving the replay protection list when using sl_btmesh_node_power_off command.
1325267	Fixed element sequence number writing when the configured write interval exponent is set to zero.
1334927	Fixed an issue that could cause a hard fault when GATT proxy server receives data during resource starvation.

Fixed in release 6.1.0.0

ID #	Description
1235337	Made GATT service discovery more robust on an overloaded device.
1247422	Made vendor model reception more robust on an overloaded device.
1252252	Fixed when a Generic Move message leads to a dim up, which could overflow to a dim down.
1254356	Fixed a regression with friend subsystem deinitialization.
1276121	Fixed application key index truncation at BGAPI level when embedded provisioner invokes a key refresh procedure.

Fixed in release 6.0.1.0

ID #	Description
1226000	Extended Provisioner BGAPI function for checking node identity to also check private node identity.
1206620	Fixed problems caused by missing BGAPI events during high load to correct firmware verification problems.
1230833	Fixed friend subsystem deinitialization so that reinitialization works without resetting the device.
1243565	Fixed crash that could occur if provisioner initialization failed, for example because of malformed DCD.
1244298	Fixed reporting of spurious extra octets in the Register Status event of the Scene Client model.
1243556	Automatic node initialization removed for BT Mesh application components. Now all components can be used also in Provisioner role.

Fixed in release 6.0.0.0

ID #	Description
360955	The interval between first and second attention timer event could be other than one second.
1198887	Private beacon random advertiser address is the same for all subnets while it should be different.
1202073	Btmesh_ncp_empty example does not have enough RAM on BRD4182 with GCC compiler.
1202088	Btmesh_soc_switch example does not have enough RAM on BRD4311 and BRD4312 with IAR compiler
1206714	Proxy server should emit a beacon over proxy connection when a subnet is added to the proxy server
1206715, 1211012, 1211022	Support for device composition data page 2, 129 and 130 should be present in configuration server model as well as large composition data server model when remote provisioning is supported
1211017	Periodic publishing of location information should alternate between global and local location when both are known
1212373	Resource leak in proxy connection handling after several hundred proxy connections have been opened and closed
1212854	Pull mode MBT transfer to an LPN does not complete successfully
1197398, 1194443	DFU distributor application is currently not able to handle more than 60 nodes successfully
1202088	Btmesh_soc_switch_ctl example compiles on all boards with IAR compiler.

4 Known Issues in the Current Release

Issues in bold were added since the previous release.

ID #	Description	Workaround
401550	No BGAPI event for segmented message handling failure.	Application needs to deduce failure from timeout / lack of application layer response; for vendor models an API has been provided.
454059	A large number of key refresh state change events are generated at the end of KR process, and that may flood NCP queue.	Increase NCP queue length in the project.
454061	Slight performance degradation compared to 1.5 in round-trip latency tests was observed.	
624514	Issue with re-establishing connectable advertising if all connections have been active and GATT proxy is in use.	Allocate one more connection than is needed.
841360	Poor performance of segmented message transmission over GATT bearer.	Ensure that the underlying BLE connection's Connection interval is short; ensure that ATT MTU is large enough to fit a full Mesh PDU; tune the minimum connection event length to allow multiple LL packets to be transmitted per connection event.
1121605	Rounding errors may cause scheduled events to trigger at very slightly different times than expected.	
1226127	Host provisioner example can be stuck when it starts to provision a second node.	Restart the host provisioner app before provisioning the second node.
1204017	Distributor is not able to handle parallel self FW Update and FW Upload.	Don't run self FW update and FW upload in parallel.
1338936	GATT proxy might not resume service advertisement after disconnection in an overload situation.	Ensure that enough buffers are reserved for traffic handling. Plan the network and communication patterns so that no node is overwhelmed with traffic. Fixes to 1356050 mitigate this issue to a large extent.
1412121	At the moment only one Scheduler Server model is permitted, and it has to be located on the primary element.	
1518613	Btmesh host provisioner app fails to provision devices the second time.	Set CBP to 0.
1518167	With IAR on bare metal examples, bt_evt_system_boot does not arrive after bt_cmd_system_reset.	Set SL_STACK_SIZE to 0x1400 or higher.

5 Deprecated Items

Deprecated in release 6.0.0.0

The BGAPI command `sl_btmesh_node_get_networks()` has been deprecated. Use `sl_btmesh_node_key_key_count()` and `sl_btmesh_node_get_key()` instead.

The BGAPI commands `sl_btmesh_test_set_segment_send_delay()` and `sl_btmesh_test_set_sar_config()` have been deprecated. Use `sl_btmesh_sar_config_set_sar_transmitter()` and `sl_btmesh_sar_config_server_set_sar_receiver()` instead.

6 Removed Items

Removed in release 6.0.0.0

The BGAPI commands `sl_btmesh_test_set_local_config()` and `sl_btmesh_test_get_local_config()` have been removed.

The BGAPI commands `sl_btmesh_node_get_statistics()` and `sl_btmesh_node_clear_statistics()` have been removed.

7 Using This Release

This release contains the following

Silicon Labs Bluetooth Mesh stack library

Bluetooth Mesh sample applications

If you are a first time user, see [QSG176: Silicon Labs Bluetooth Mesh SDK v2.x Quick-Start Guide](#).

7.1 Installation and Use

The Bluetooth Mesh 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.

The GSDK default install location has changed with Simplicity Studio 5.3 and higher.

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/>.

7.2 Security Information

Secure Vault Integration

This version of the stack is integrated with Secure Vault Key Management. When deployed to Secure Vault High devices, mesh encryption keys are protected using the Secure Vault Key Management functionality. The table below shows the protected keys and their storage protection characteristics.

Key	Exportability on a node	Exportability on Provisioner	Notes
Network key	Exportable	Exportable	Derivations of the network key exist only in RAM while network keys are stored on flash
Application key	Non-exportable	Exportable	
Device key	Non-exportable	Exportable	In Provisioner's case, applied to Provisioner's own device key as well as other devices' keys

Keys that are marked as "Non-Exportable" can be used but cannot be viewed or shared at runtime.

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 [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 of:

The screenshot shows the 'Update Preference' form in the Silicon Labs customer portal. The form is titled 'Update Preference' and has a sub-header 'WHAT EMAILS WOULD YOU LIKE TO RECEIVE?'. Under this section, there are two categories: 'Newsletters' and 'Product Specific Notifications'. The 'Product Specific Notifications' category has a checkbox for 'Software/Security Advisory Notices & Product Change Notices (PCNs)' which is checked and highlighted with a red box. Below this, there is a section titled 'SELECT THE PRODUCTS TO RECEIVE UPDATES FOR'. This section contains a list of product categories with checkboxes. The 'Microcontrollers' category is checked and highlighted with a red box, and the 'Wireless' category is also checked and highlighted with a red box. Within the 'Microcontrollers' category, the '32-bit MCUs' checkbox is checked. Within the 'Wireless' category, the 'Proprietary' checkbox is checked.

7.3 Support

Development Kit customers are eligible for training and technical support. Use the [Silicon Labs Bluetooth Mesh web page](#) to obtain information about all Silicon Labs Bluetooth products and services, and to sign up for product support.

Contact Silicon Laboratories support at <http://www.silabs.com/support>.

Simplicity Studio

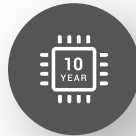
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