Bluetooth® mesh SDK 2.0.2.0 GA
Gecko SDK Suite 3.1
April 7, 2021

Bluetooth mesh is a new topology available for Bluetooth Low Energy (LE) devices that enables many-to-many (m:m) communication. It’s 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 5.2 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.

These release notes cover SDK versions:

- 2.0.2.0 released April 7, 2021
- 2.0.1.0 released January 27, 2021
- 2.0.0.0 released December 9, 2020

Compatibility and Use Notices

This Gecko SDK Suite release has a known security compatibility issue with one Gecko Platform component. For more information about this, as well as other 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:

Note: The supported compilers will be upgraded to ARM GCC-10-2020-q4-update and IAR 8.50.9 in the next major release.

IAR Embedded Workbench for ARM (IAR-EWARM) version 8.30.1
- 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 7.2.1, provided with Simplicity Studio.
- Link-time optimization feature of GCC has been disabled, resulting in slight increase of image size

KEY FEATURES
- Support added for MGM220P, xGM210LA, BGM220SC22HNA modules
- Integration with Gecko SDK Suite
- Simplicity Studio 5 support added
- New Bluetooth Mesh APIs
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# New Items

## 1.1 New Features

### Added in release 2.0.2.0

#### New Example Applications

Secure NCP host examples (NCP daemon and empty NCP host example) were added to demonstrate Secure NCP communication with the NCP target example (with NCP Security Interface Component enabled).

Low power optimized switch example was added. The switch example is now available in both low power optimized and developer experience optimized versions.

#### New UC Components

UC component for factory reset functionality was added. The factory reset UC component is capable of performing node reset as well as full NVM3 reset, which can be triggered in reference examples by pushing the left and right push buttons.

UC component for generic models was added to allow separate initialization of lighting and generic models for projects that do not use lighting models.

UC component for application development utility macros was added

### Added in release 2.0.1.0

#### New Hardware Support

Support for the following hardware was added: Thunderboard BG22 B variant, xGM210P module.

### Added in release 2.0.0.0

#### New Hardware Support

Support for the following modules was added: MGM220P, xGM210LA lighting modules, BGM220SC22HNA SIP module.

#### Gecko SDK Suite

Bluetooth Mesh SDK release 2.0.0.0 is the first Bluetooth Mesh SDK release that has been integrated in the Silicon Labs Gecko SDK Suite.

#### Simplicity Studio v5

As of SDK version 2.0.0.0, Simplicity Studio v5 is required to run the Bluetooth Mesh SDK, instead of the Simplicity Studio v4 used by the older releases.

## 1.2 New APIs

The structure and overall interface of the Bluetooth Mesh API has changed in a backward-incompatible manner. For migrating from APIs on the v1.x SDK please refer to AN1298: Transitioning from the v1.x to the v2.x Bluetooth Mesh SDK. No major new functionality compared to the latest 1.x release was added in this release.

For additional documentation please refer to the Bluetooth Mesh Software API Reference Manual installed with the Bluetooth Mesh SDK.
2 Improvements

2.1 Changed APIs

**Changed in release 2.0.2.0**

A configuration item was added for the interval used when writing sequence number updates to flash.

Added BGAPI commands and events for testing replay protection list functionality during development.

The following BGAPI command has been added to the test BGAPI:

```
sl_btmesh_test_set_replay_protection_list_diagnostics()
```

The following BGAPI events have been added to the test BGAPI:

```
sl_btmesh_evt_test_replay_protection_list_entry_set,
sl_btmesh_evt_test_replay_protection_list_entry_cleared,
sl_btmesh_evt_test_replay_protection_list_saved,
sl_btmesh_evt_test_replay_protection_list_full
```

Added a command for reducing relayed data when PDUs are destined to a unicast address across a GATT bearer.

The following BGAPI command has been added to the proxy BGAPI:

```
sl_btmesh_proxy_optimization_toggle()
```

**Changed in release 2.0.0.0**

Release 2.0.0.0 contains multiple backward-incompatible changes compared to the Bluetooth Mesh 1.x releases. Because of this, existing projects will not work as such and must be migrated to the new API. For migrating from APIs on the v1.x SDK please refer to [AN1298: Transitioning from the v1.x to the v2.x Bluetooth Mesh SDK](#).

Other than the overall change of API, the following modifications have been done mainly to add minor new functionality to the existing BGAPI classes:

- Configuration client class command for querying node key refresh state was added.
- Node class command for event filtering was removed as filtering is now implemented in common NCP code.
- Node class command for informing the stack of imminent power cut was added.
- Node class command for querying replay protection list status was added.
- Provisioner class command for checking node identity beacon data in the application was added.
- Test class command for getting the local DCD structure was added.
## 3 Fixed Issues

### Fixed in release 2.0.2.0

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>490276</td>
<td>BGAPI command sl_btmesh_node_get_uuid() now also works before the mesh stack is initialized</td>
</tr>
<tr>
<td>648641</td>
<td>Fixed link layer scheduling that affected friendship timings</td>
</tr>
<tr>
<td>655402</td>
<td>Sequence numbers are now zeroed after IV index recovery</td>
</tr>
<tr>
<td>658294</td>
<td>Fixed sensor configuration on certain Thunderboard Sense 2 and BG22 boards</td>
</tr>
<tr>
<td>664804</td>
<td>Fixed Bluetooth advertisement configuration when proxy feature is not enabled</td>
</tr>
<tr>
<td>667050</td>
<td>Fixed lightness update on scene recall</td>
</tr>
<tr>
<td>667077</td>
<td>Fixed UI update handling when called from sleeptimer interrupt context</td>
</tr>
<tr>
<td>670760</td>
<td>Fixed network PDU handling for PDUs originating from a device that has TTL=1</td>
</tr>
<tr>
<td>674055</td>
<td>Fixed an issue with new application key deployment during a key refresh operation</td>
</tr>
<tr>
<td>679039</td>
<td>Fixed an issue with multiple mesh_lib_init() calls</td>
</tr>
<tr>
<td>680002</td>
<td>Fixed an issue with Generic Battery status message</td>
</tr>
<tr>
<td>683908</td>
<td>Read default transition time server state from persistent storage</td>
</tr>
</tbody>
</table>

### Fixed in release 2.0.1.0

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>631371</td>
<td>Proper recovery for the rare case when communication fails at the finalization of the provisioning process</td>
</tr>
<tr>
<td>640696</td>
<td>Fixed reporting of delayed requests in LC server model</td>
</tr>
<tr>
<td>651991</td>
<td>Fixed an issue with NCP when events and command responses are interleaved</td>
</tr>
<tr>
<td>652878</td>
<td>Fixed an issue with LC model organization in sample application device composition data</td>
</tr>
<tr>
<td>652915</td>
<td>Fixed a GATT configuration issue if OTA service is removed from project</td>
</tr>
<tr>
<td>655727</td>
<td>Fix hardcoded default TTL on embedded provisioner to read the value from the configuration model state instead</td>
</tr>
<tr>
<td>658240</td>
<td>Fixed example application visibility for all relevant parts in Simplicity Studio launcher</td>
</tr>
</tbody>
</table>

### Fixed in release 2.0.0.0

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5662</td>
<td>Default device UUID now conforms to RFC4122 without explicitly setting it.</td>
</tr>
<tr>
<td>357307</td>
<td>Heartbeat publication set command parameter handling fixed.</td>
</tr>
<tr>
<td>401549</td>
<td>Added a node command for checking replay protection list state.</td>
</tr>
<tr>
<td>443806</td>
<td>Fixed an issue with GATT database service capabilities management.</td>
</tr>
<tr>
<td>466452</td>
<td>Fixed provisioning cleanup code in case provisioning fails after device address allocation.</td>
</tr>
<tr>
<td>639443</td>
<td>Test command for managing replay protection list added.</td>
</tr>
<tr>
<td>646954</td>
<td>Removed an artificial limitation on IV index update age.</td>
</tr>
<tr>
<td>646982</td>
<td>Fixed error handling in node and provisioner initialization calls if already initialized.</td>
</tr>
</tbody>
</table>
## 4 Known Issues in the Current Release

Issues in bold were added since the previous release.

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>3878</td>
<td>Mesh GATT events visible to the application</td>
<td>Application can ignore BGAPI events related to GATT provisioning and proxying based on service and characteristic parameters</td>
</tr>
<tr>
<td>401550</td>
<td>No BGAPI event for segmented message handling failure</td>
<td>Application needs to deduce failure from timeout / lack of application layer response</td>
</tr>
<tr>
<td>418636</td>
<td>Issues with mesh_test local configuration state API (node identity, relay, network retransmission)</td>
<td></td>
</tr>
<tr>
<td>454059</td>
<td>A large number of key refresh state change events are generated at the end of KR process, and that may flood NCP queue</td>
<td>Increase NCP queue length in the project</td>
</tr>
<tr>
<td>454061</td>
<td>Slight performance degradation compared to 1.5 in round-trip latency tests was observed</td>
<td></td>
</tr>
<tr>
<td>454332</td>
<td>Missing Mesh-specific API for generating and receiving scan response data for GATT provisioning service advertisements</td>
<td>Use the LE GAP API</td>
</tr>
<tr>
<td>624514</td>
<td>Issue with re-establishing connectable advertising if all connections have been active and GATT proxy is in use</td>
<td>Allocate one more connection than is needed</td>
</tr>
<tr>
<td>650825</td>
<td>Issue with retransmissions when a model is publishing periodically</td>
<td>Set up retransmissions in the model state and trigger periodic publishing by an application timer</td>
</tr>
<tr>
<td>653405</td>
<td>Out-of-the-box switch sample application current consumption is higher than before in low power operation</td>
<td>Serial communications and LCD display support increase the current draw and should be disabled</td>
</tr>
<tr>
<td>676798</td>
<td>Automatic LPN polling may miss friendship termination deadline due to oscillator inaccuracy</td>
<td>Ensure application timer-based explicit polling takes place before friendship terminates, if the timeout for friendship termination is long</td>
</tr>
<tr>
<td>683518</td>
<td>Friendship termination event is not immediately seen when a friendship clear message is received</td>
<td>The event will be raised once friendship timeout expires</td>
</tr>
<tr>
<td>690862</td>
<td>SoC empty example does not start beaconing on xG22 hardware</td>
<td>In the project configuration, set IO Stream USART setting “Restrict the energy mode to allow the reception” to on, and rebuild the project</td>
</tr>
</tbody>
</table>
5 Deprecated Items

None
6 Removed Items

**Removed in release 2.0.0.0**

Commands that have been deprecated in past SDK releases have been removed in Bluetooth Mesh SDK 2.0. Past releases have introduced replacements for the deprecated commands; these replacements have been migrated to the new API.

The events corresponding to the deprecated commands that were also deprecated are also removed. Past releases have introduced replacements for the deprecated events; these replacements have been migrated to the new API.
7 Using This Release

This release contains the following

- Silicon Labs Bluetooth mesh stack library
- Bluetooth 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

A registered account at Silicon Labs is required in order to download the Silicon Labs Bluetooth SDK. You can register at https://siliconlabs.force.com/apex/SL_CommunitiesSelfReg?form=short.

Stack installation instruction are covered in QSG176: Silicon Labs Bluetooth Mesh SDK v2.x Quick-Start Guide.

Use the Bluetooth mesh SDK with the Silicon Labs Simplicity Studio V4 development platform. Simplicity Studio ensures that most software and tool compatibilities are managed correctly. Install software and board firmware updates promptly when you are notified.

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

7.2 Security Information

Secure Vault Integration

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

Security Advisories

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

Development Kit customers are eligible for training and technical support. Use the Silicon 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.
8 Legal

8.1 Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and “Typical” parameters provided can and do vary in different applications. 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 reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability 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. **Note: This content may contain offensive terminology that is now obsolete. Silicon Labs is replacing these terms with inclusive language wherever possible. For more information, visit [www.silabs.com/about-us/inclusive-lexicon-project](http://www.silabs.com/about-us/inclusive-lexicon-project)**

8.2 Trademark Information

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