Bluetooth® mesh SDK 7.0.1.0 GA
Simplicity SDK Suite 2024.6.1
July 24, 2024

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 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. These release notes cover SDK versions:

7.0.1.0 released July 24, 2024
7.0.0.0 released June 5, 2024

Compatibility and Use Notices

For more information about security updates and notices, see the Security chapter of the 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 `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.
- Link-time optimization feature of GCC has been disabled, resulting in a slight increase of image size.
1 New Items

Simplicity SDK is an embedded software development platform for building IoT products based on our Series 2 and Series 3 wireless and MCU devices. It integrates wireless protocol stacks, middleware, peripheral drivers, a bootloader, and application examples—a solid framework for building power-optimized and secure IoT devices.

The Simplicity SDK offers powerful features such as ultra-low power consumption, strong network reliability, support for a large number of nodes, and abstraction of complex requirements like multiprotocol and pre-certification. Additionally, Silicon Labs provides over-the-air (OTA) software and security updates to remotely update devices, minimize maintenance costs, and enhance the end-user product experience.

Simplicity SDK is a follow-on from our popular Gecko SDK, which will continue to be available providing long-term support for our Series 0 and Series 1 devices. For additional information on the Series 0 and Series 1 devices please reference: Series 0 and Series 1 EFM32/EZR32/EFR32 device (silabs.com).

1.1 New Features

**Added in release 7.0.1.0**

Support for Mesh Device Firmware Update (DFU) that makes use of an efficient delta compression, based on recognizing the differences between two firmware versions, has been added. The feature requires the use of a version of the Commander tool that supports analyzing ELF binary differences, as well as the use of a bootloader that supports applying the compressed firmware update.

**Added in release 7.0.0.0**

Support for Clock Manager has been added. The stack components no longer use device_init() for clock initialization. Instead, the application project must now include the clock_manager component which does the clock initialization.

Support for Common Memory Manager has been added.

1.2 New APIs

**Added in release 7.0.0.0**

None.
2 Improvements

**Changed in release 7.0.0.0**

**BGAPI changes:**

A node BGAPI class command, `sl_btmesh_node_test_identity`, has been added for checking whether a received node identity advertisement originates from a given node or not.

**Example application changes:**

Low Power Node feature has been added to Sensor server examples (btmesh_soc_sensor_thermometer, btmesh_soc_nlc_sensor_occupancy btmesh_soc_nlc_sensor_ambient_light), and Friend feature was added to the sensor server client example (btmesh_soc_sensor_client).
## 3 Fixed Issues

### Fixed in release 7.0.1.0

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1301325</td>
<td>Fixed an issue in storing Scheduler model actions.</td>
</tr>
<tr>
<td>1305041</td>
<td>Fixed timeout issue in NCP communication from host to EFR32.</td>
</tr>
<tr>
<td>1305928</td>
<td>Fixed loss of correct Receivers list data in DFU events after event loss fix 1258654 was implemented.</td>
</tr>
<tr>
<td>1319326</td>
<td>Fixed incorrect values for input and output OOB authentication bit enumerations.</td>
</tr>
<tr>
<td>1325194</td>
<td>Fixed unnecessary duplication of DFU distributor client receiver status event after event loss fix 1258654 was implemented.</td>
</tr>
<tr>
<td>1310377</td>
<td>Fixed an issue in IOP Relay app. Previously, it only beaconed using GATT.</td>
</tr>
</tbody>
</table>

### Fixed in release 7.0.0.0

<table>
<thead>
<tr>
<th>ID #</th>
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</tr>
</thead>
<tbody>
<tr>
<td>356148</td>
<td>Avoids starting advertisement bearer if node is being provisioned using only PB-GATT.</td>
</tr>
<tr>
<td>1250461</td>
<td>Made provisioning event reporting more robust on an overloaded device.</td>
</tr>
<tr>
<td>1258654</td>
<td>Made DFU event reporting more robust on an overloaded device.</td>
</tr>
<tr>
<td>1274632</td>
<td>DFU Distributor and Standalone Updater models will now report an error if Blob Transfer configuration on the node is not sufficient.</td>
</tr>
<tr>
<td>1284204</td>
<td>Fixed saving replay protection to NVM3 when application uses the sl_btmesh_node_power_off() API.</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>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; for vendor models an API has been provided.</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>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>841360</td>
<td>Poor performance of segmented message transmission over GATT bearer.</td>
<td>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.</td>
</tr>
<tr>
<td>1121605</td>
<td>Rounding errors may cause scheduled events to trigger at very slightly different times than expected.</td>
<td></td>
</tr>
<tr>
<td>1226127</td>
<td>Host provisioner example can be stuck when it starts to provision a second node.</td>
<td>Restart the host provisioner app before provisioning the second node.</td>
</tr>
<tr>
<td>1204017</td>
<td>Distributor is not able to handle parallel self FW Update and FW Upload.</td>
<td>Don’t run self FW update and FW upload in parallel.</td>
</tr>
</tbody>
</table>
5 Deprecated Items

Deprecated in release 7.0.0.0

The BGAPI command sl_btmesh_prov_test_identity has been deprecated. Use sl_btmesh_node_test_identity instead.
6 Removed Items

Removed in release 7.0.0.0

Support for Series 1 hardware (xG12 and xG13) has been removed in this release.
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 Simplicity SDK (GSDK), the suite of Silicon Labs SDKs. To quickly get started with the Simplicity SDK, install Simplicity Studio 5, which will set up your development environment and walk you through Simplicity SDK 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, Simplicity SDK may be installed manually by downloading or cloning the latest from GitHub. See https://github.com/SiliconLabs/simplicity_sdk for more information.

Simplicity Studio installs the Simplicity SDK by default in:

- Windows: C:\Users\<NAME>\SimplicityStudio\SDKs\simplicity_sdk
- MacOS: /Users/<NAME>/SimplicityStudio/SDKs/simplicity_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.

<table>
<thead>
<tr>
<th>Key</th>
<th>Exportability on a node</th>
<th>Exportability on Provisioner</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network key</td>
<td>Exportable</td>
<td>Exportable</td>
<td>Derivations of the network key exist only in RAM while network keys are stored on flash</td>
</tr>
<tr>
<td>Application key</td>
<td>Non-exportable</td>
<td>Exportable</td>
<td>In Provisioner’s case, applied to Provisionerr’s own device key as well as other devices’ keys</td>
</tr>
<tr>
<td>Device key</td>
<td>Non-exportable</td>
<td>Exportable</td>
<td></td>
</tr>
</tbody>
</table>

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 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:

![Security Advisories Example](image)

### 7.3 Support

Development Kit customers are eligible for training and technical support. Use the [Silicon Labs Bluetooth mesh web page](http://www.silabs.com/support) 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](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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www.silabs.com/IoT

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www.silabs.com/simplicity

Quality
www.silabs.com/quality

Support & Community
www.silabs.com/community

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