Bluetooth® mesh SDK 5.0.0.0 GA

Gecko SDK Suite 4.3

June 7, 2023

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 5.3 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.

These release notes cover SDK versions:

5.0.0.0-released June 7, 2023

Bluetooth

KEY FEATURES

- Support for Mesh Protocol 1.1
- Support for Mesh Model 1.1
- Support for Mesh Binary Large Object Transfer
- Support for Mesh Device Firmware Update

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.

Specification Compatibility:

This release contains an implementation of the Mesh Protocol 1.1, Mesh Model 1.1, Mesh Binary Large Object Transfer, and Mesh Device Firmware Update specifications. These specifications are not yet adopted Bluetooth SIG specifications, and no Bluetooth qualification program currently exists for these specifications. Therefore, these specifications are not approved for use in commercial production. Any experimental use of the features in these specifications are “AS IS”, and no Bluetooth license rights are granted.

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 9.20.4

- 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 10.3-2021.10, provided with Simplicity Studio.

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

Contents

1 New Items

1.1 New Features

Added in release 5.0.0.0

New Hardware Support

Support was added for EFR32xG27 product family and BG24 WLCSP Radio Boards.

Support was added for EFR32xG22 Revision D.

Support was added for EFR32xG21, Revision C and later.

1.2 New APIs

None

2 Improvements

Changed in release 5.0.0.0

Code size optimization of stack and example applications.

Example applications and SLC Components were optimized for No-Code and Low-Code development.

3 Fixed Issues

Fixed in release 5.0.0.0

ID #	Description
1102630	Optimizations to Device Firmware Update over GATT proxy
1086169, 1113729, 1117608	Multiple fixes to BLOB transfer models
1123776	Fixed an issue with private network beacons sent over GATT proxy
1125121	Corrected handling of invalid firmware deletion message
1133103, 1134497	Multiple fixes for remote provisioning
1134494, 1134495	Multiple fixes to Large Composition Data models

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.**	

5 Deprecated Items

None

6 Removed Items

None

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 Provisionerr's own device key as well as other devices' keys

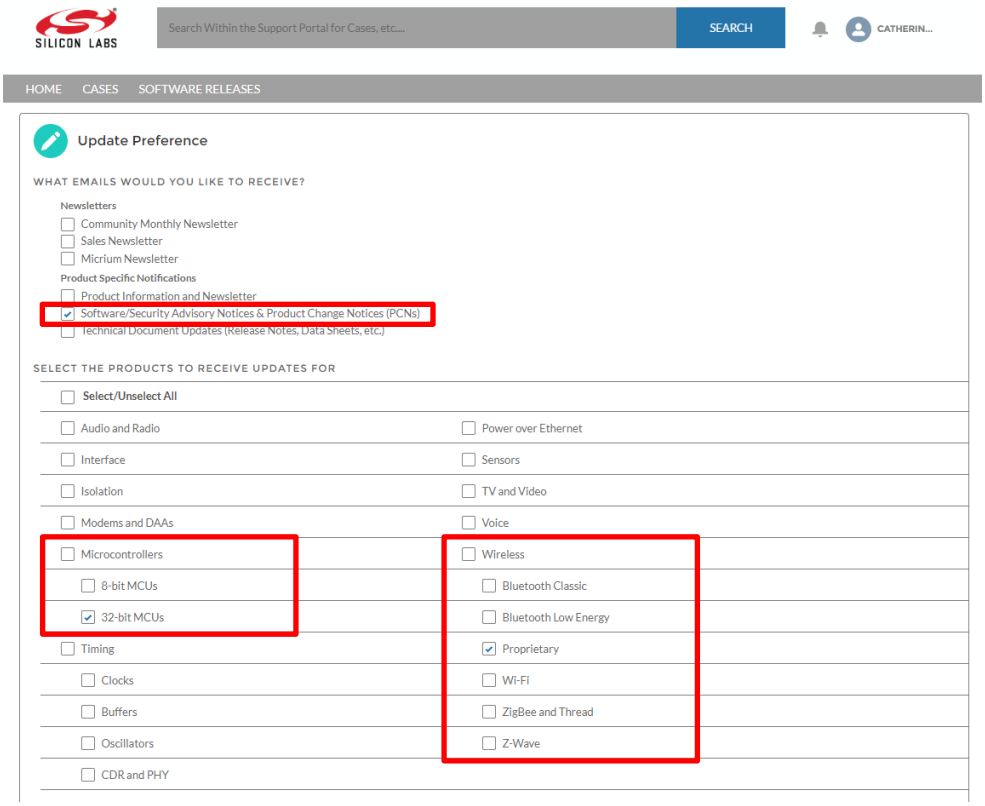
Keys that are marked as "Non-Exportable" can be used but cannot be viewed or shared at runtime.

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 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.



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.

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