



# Silicon Labs OpenThread SDK 1.2.0.0 GA

## Gecko SDK Suite 3.2

### June 16, 2021


Thread is a secure, reliable, scalable, and upgradeable wireless IPv6 mesh networking protocol. It provides low-cost bridging to other IP networks while optimized for low-power / battery-backed operation. The Thread stack is designed specifically for Connected Home applications where IP-based networking is desired and a variety of application layers may be required.

OpenThread released by Google is an open-source implementation of Thread. Google has released OpenThread in order to accelerate the development of products for the connected home and commercial buildings. With a narrow platform abstraction layer and a small memory footprint, OpenThread is highly portable. It supports system-on-chip (SoC), network co-processor (NCP), and radio co-processor (RCP) designs.

Silicon Labs has developed an OpenThread-based SDK tailored to work with Silicon Labs hardware. The Silicon Labs OpenThread SDK is a fully tested enhanced version of the GitHub source. It supports a broader range of hardware than does the GitHub version, and includes documentation and example applications not available on GitHub.

These release notes cover SDK version(s):

1.2.0.0 released on June 16, 2021



**KEY FEATURES**

- Secure Vault support
- 802.15.4 multi-PAN RCP for Raspberry Pi
- Thread 1.2 (pre-compliance)
- Sub-GHz Thread (alpha)
- Updated GCC compiler version

### 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 [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 OpenThread SDK, see [Using This Release](#).

#### Compatible Compilers:

GCC (The GNU Compiler Collection) version 10.2.0, provided with Simplicity Studio.

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## Contents

|     |  |    |
|-----|--|----|
| 1   | New Items .....  | 1  |
| 1.1 | New Features from OpenThread GitHub Repo .....               | 1  |
| 1.2 | New Features from OpenThread Border Router GitHub Repo ..... | 1  |
| 1.3 | New Components .....   | 1  |
| 1.4 | New Features .....   | 1  |
| 2   | Improvements .....   | 3  |
| 3   | Fixed Issues .....   | 4  |
| 4   | Known Issues in the Current Release .....                    | 5  |
| 5   | Deprecated Items .....                                       | 6  |
| 6   | Removed Items .....  | 7  |
| 7   | Using This Release .....                                     | 8  |
| 7.1 | Installation and Use .....                                   | 8  |
| 7.2 | Using the Border Router .....                                | 8  |
| 7.3 | NCP/RCP Support .....  | 8  |
| 7.4 | Security Information .....                                   | 9  |
| 7.5 | Support .....  | 10 |

## 1 New Items

### 1.1 New Features from OpenThread GitHub Repo

#### Added in release 1.2.0.0

The Silicon Labs OpenThread SDK includes all changes from the OpenThread GitHub repo (<https://github.com/openthread/openthread>) up to and including commit **cf21d5760**. Any features introduced between commits **5c2ad91cf** and **cf21d5760** can be considered new items with the Silicon Labs OpenThread 1.2 SDK. An enhanced version of the OpenThread repo can be found in the following Simplicity Studio 5 location:

Simplicity Studio\developer\sdk\gecko\_sdk\_suite\<version>\util\third\_party\openthread

### 1.2 New Features from OpenThread Border Router GitHub Repo

#### Added in release 1.2.0.0

The Silicon Labs OpenThread SDK includes all changes from the OpenThread border router GitHub repo (<https://github.com/openthread/ot-br-posix>) up to and including commit **c0ef5a48339**. Any features introduced between commits **a37e299ff** and **c0ef5a48339** can be considered new items with the Silicon Labs OpenThread 1.2 SDK. An enhanced version of the OpenThread border router repo can be found in the following Simplicity Studio 5 location:

Simplicity Studio\developer\sdk\gecko\_sdk\_suite\<version>\util\third\_party\ot-br-posix

Refer to section 7.3 for information on using the border router.

### 1.3 New Components

#### Added in release 1.2.0.0

**Antenna Diversity:** This component provides support for Antenna Diversity with OpenThread.

**Coexistence:** This component provides support for Wi-Fi coexistence with OpenThread.

**NCP CPC:** This component provides Co-Processor Communication (CPC) support for the OpenThread stack. It requires that the OpenThread NCP component be included with the project. Currently only the OpenThread RCP stack is supported.

### 1.4 New Features

#### Added in release 1.2.0.0

##### **Secure Vault Integration**

OpenThread has been integrated with Secure Vault. Refer to [Security Information](#) for information on the keys that are protected using the Secure Vault Key Management functionality and *AN1329: Using Silicon Labs Secure Vault Features with OpenThread* for a description of how Secure Vault features are leveraged in OpenThread applications.

##### **802.15.4 multi-PAN RCP for Raspberry Pi**

Multi-PAN RCP allows for multiple OpenThread and Zigbee applications on a Linux host processor to interact with a single shared EFR32 802.15.4 Radio Co-Processor (RCP) with multi-PAN support. Each stack can use the RCP to communicate on its own 802.15.4 PAN, simultaneously and independently, as long as all PANs are on the same 802.15.4 channel. For more information refer to *AN1334: Interfacing with the Silicon Labs Multi-PAN 802.15.4 RCP – alpha*.

**Thread 1.2 (pre-compliance)**

All Thread 1.2 features are enabled by default in OpenThread sample applications. Refer to *AN1295: Developing with Thread 1.2* for additional information.

**Sub-GHz Thread (alpha)**

OpenThread applications can now operate on a proprietary sub-GHz band. Refer to *AN1350: Single-Band Proprietary Sub-GHz Support with OpenThread* for additional information.

**Updated GCC compiler version**

GCC version 10.2.0 is now supported.

**Thread Duckhorn Features**

All Thread Duckhorn features included in the OpenThread GitHub repo up to and including commit **cf21d5760** are included but are not enabled by default.

## 2 Improvements

None

### 3 Fixed Issues

#### Fixed in release 1.2.0.0

| ID #   | Description  |
|--------|--|
| 636888 | Bad RX packet length causes assert   |
| 650113 | Thread Test Harness Leader Test 9.2.5 fails  |
| 653070 | Coexistence Component: "PWM on Request" not currently working. Request, Grant, and Priority are held high. |
| 655515 | otPlatRadioGetTransmitPower does not return correct value  |

## 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/products/software>.

| ID #             | Description  | Workaround  |
|------------------|--|---|
| 482915<br>495241 | A known limitation with the UART driver can cause characters to be lost on CLI input or output. This can happen during particularly long critical sections that may disable interrupts, so it can be alleviated by repeating the CLI or waiting long enough for state changes. | No known workaround   |
| <b>695654</b>    | <b>Domain and Global addresses aren't pingable over the Ethernet backbone in docker installation</b>   | <b>Requires end-user IPv6 configuration on Linux host</b>                         |
| <b>703615</b>    | <b>If the RCP is taken offline, the OTBR doesn't recover</b>   | <b>No known workaround</b>  |
| <b>706866</b>    | <b>Packets can be dropped when stress testing host/RCP solutions at a very high data rate</b>  | <b>No known workaround</b>  |
| <b>706901</b>    | <b>OpenThread Border Router Thread 1.1 certification test REED 5.7.2 fails</b>   | <b>No known workaround</b>  |
| <b>714047</b>    | <b>CLI cannot be easily removed from sample applications</b>   | <b>Compilation and linking issues can be resolved by modifying shipping code.</b> |
| <b>714451</b>    | <b>Issues with promptness and accuracy of enhanced ACKs to CSL children</b>  | <b>No known workaround</b>  |

## 5 Deprecated Items

None



## 6 Removed Items

None

## 7 Using This Release

This release contains the following

- Silicon Labs OpenThread stack
- Silicon Labs OpenThread sample applications
- Silicon Labs OpenThread border router

For more information about the OpenThread SDK see [QSG170: Silicon Labs OpenThread QuickStart Guide](#). If you are new to Thread see [UG103.11: Thread Fundamentals](#).

### 7.1 Installation and Use

A registered account at Silicon Labs is required in order to download the Silicon Labs OpenThread SDK. You can register at [https://siliconlabs.force.com/apex/SL\\_CommunitiesSelfReg?form=short](https://siliconlabs.force.com/apex/SL_CommunitiesSelfReg?form=short).

Stack installation instructions are covered in the [Simplicity Studio 5 online User's Guide](#).

Use the OpenThread SDK v1.x with the Silicon Labs Simplicity Studio 5 development platform only. The SDK is not compatible with Simplicity Studio 4.

Documentation specific to the SDK version is installed with the SDK. API references and other information about this release are available on <https://docs.silabs.com/openthread/1.2/>.

### 7.2 Using the Border Router

For ease of use, Silicon Labs recommends the use of a Docker container for your OpenThread border router. Please refer to [AN1256: Using the Silicon Labs RCP with the OpenThread Border Router](#) for details on how to set up the correct version of OpenThread border router Docker container. It is available at <https://hub.docker.com/r/siliconlabsinc/openthread-border-router>.

The Silicon Labs OpenThread RCP is meant for use with the OpenThread border router built using the ot-br-posix repository (git commit **c0ef5a48339**). Our copy of the OpenThread stack (git commit **cf21d5760**) should be symbolically linked under "third\_party\openthread\repo" in the ot-br-posix repository.

For your convenience we have included copies of these repositories in the GSDK, located here:

```
Simplicity Studio\developer\sdk\gecko_sdk_suite\<version>\util\third_party\ot-br-posix
```

```
Simplicity Studio\developer\sdk\gecko_sdk_suite\<version>\util\third_party\openthread
```

If you are manually installing a border router, using the copies provided above is recommended. Refer to [AN1256: Using the Silicon Labs RCP with the OpenThread Border Router](#) for more details.

Although updating the border router environment to a later GitHub version is supported on the OpenThread website, it may make the border router incompatible with the OpenThread RCP stack in the SDK.

### 7.3 NCP/RCP Support

The OpenThread NCP support is included with OpenThread SDK but any use of this support should be considered experimental. The OpenThread RCP is fully implemented and supported.

## 7.4 Security Information

### Secure Vault Integration

When deployed to Secure Vault High devices, sensitive keys such as the Thread Master Key are protected using the Secure Vault Key Management functionality. The following table shows the protected keys and their storage protection characteristics.

| Wrapped Key        | Exportable / Non-Exportable | Notes                               |
|--------------------|-----------------------------|-------------------------------------|
| Thread Master Key  | Exportable                  | Must be exportable to form the TLVs |
| PSKc               | Exportable                  | Must be exportable to form the TLVs |
| Key Encryption Key | Exportable                  | Must be exportable to form the TLVs |
| MLE Key            | Non-Exportable              |                                     |
| Temporary MLE Key  | Non-Exportable              |                                     |
| MAC Previous Key   | Non-Exportable              |                                     |
| MAC Current Key    | Non-Exportable              |                                     |
| MAC Next Key       | Non-Exportable              |                                     |

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.

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  - ZigBee and Thread
  - Z-Wave

## 7.5 Support

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

You can contact Silicon Laboratories support at <http://www.silabs.com/support>.

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