Mesh network with Bluetooth low energy (BLE) nodes enabling communication between a BLE device and a Smartphone

- Control and monitor applications involving short packets
- Advertising packets used for data communication using managed flooding method
- Multi-hop data transmission up to 126 hops
- Network node support up to 32,767 nodes
- Multiple communication scenario
  - Smartphone to node communication with unicast addressing
  - Smartphone to node communication with multicast (Group) addressing
  - Smartphone to node communication with broadcast addressing
  - Node to node communication

- Secure communication
  - Devices added to a network are provisioned using proven security algorithms using 256-bit elliptic curves
  - All messages in the network are encrypted with AES-128 CCM mode
  - Privacy through obfuscation
  - Protected against security attacks like Brute-force, Bit-Flipping, Eavesdropping, Replay, Trashcan, Man in the middle and physical insecure device attacks

- Supported features
  - Publish-subscribe paradigm (up to 10 groups)
  - Node UUID configurable by user
  - Transport layer handling up to 384-byte packets
  - Provisioning and network layer based on Mesh profile v1.0
  - Heartbeat
  - Provisioned node database transfer among smartphones via e-mail and cloud applications
  - Multiple element per node support
  - Key refresh
  - Initialization vector update procedure
  - Whitelist and blacklist filtering
  - Provisioning over advertising (PB-ADV)
  - Output OOB, Input OOB, Public Key OOB Provisioning

- Supported models
  - Configuration model
  - Health model
  - Generic model on-off, level example
  - Generic Power on-off server
  - Generic Transition time server
  - Lighting model example (Lightness, CTL, HSL)
  - Light Lc Server Models
  - Light Lc controller
Product summary

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>Mesh over Bluetooth low energy</td>
<td>STSW-BNRG-Mesh</td>
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<tr>
<td>STEVAL-IDB008V2 evaluation platform based on the BlueNRG-2</td>
<td>STEVAL-IDB008V2</td>
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<td>STEVAL-IDB007V2 evaluation platform based on the BlueNRG-1</td>
<td>STEVAL-IDB007V2</td>
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<tr>
<td>Evaluation platform based on the BlueNRG-2</td>
<td>STEVAL-IDB009V1</td>
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- Vendor model
- Sensor model
- Template for Time and Scene model

- Embedded SDK available
  - Demo Application source code for user application development
  - Mesh stack provided as precompiled/object library
  - Support for BlueNRG product family
  - Ready examples for STEVAL-IDB007V2, STEVAL-IDB008V2, STEVAL-IDB009V1, STEVAL-BCN002V1B (BlueTile) and STEVAL-BLUEPLUG1
  - Over-the-air (OTA) firmware upgrade example for BlueNRG-2 over GATT

- Android and iOS SDK available
  - Demo App source code available
  - Mesh implementation provided as library
  - Android App available on Google Play Store
  - iOS App available on iTunes

- Supported devices:
  - BlueNRG-1
  - BlueNRG-2
  - BlueNRG-MS (X-NUCLEO-IDB05A1 expansion board) with STM32L152RE, STM32L476RG or STM32F401RE (refer to X-CUBE-BLEMESH1)
  - Module support for SPBTLE-RFTR (BlueNRG-MS) and SPBTLE-1S (BlueNRG-1)
  - Embedded SDK is easily portable on other evaluation boards using BlueNRG family of products by modifying the board support package (BSP)

- BT SIG Mesh 1.0 Certification

Description

BlueNRG-Mesh is a software solution for connecting multiple BLE (Bluetooth low energy) devices in Mesh networks for Internet of Things (IoT) solutions. It enables true two-way communication between Bluetooth-enabled devices in powerful, secure, integrated and range-extending Mesh networks.

The solution is compatible with the ST BlueNRG product family range.

Applications

- Smart home (lighting, HVAC, security and access control, healthcare)
- Asset tracking
- Assisted living
- Smart city (street lighting, general purpose messaging)
1 Licensing and other information

Developer-friendly license terms
The initial BlueNRG-Mesh is built over Motorola’s Mesh Over Bluetooth Low Energy (MoBLE) technology. The present solution involving both the Mesh library and applications is developed and maintained solely by STMicroelectronics.
# Revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
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<tr>
<td>21-Sep-2017</td>
<td>1</td>
<td>Initial release</td>
</tr>
<tr>
<td>14-Jun-2018</td>
<td>2</td>
<td>Updated cover page image, features and description</td>
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<tr>
<td></td>
<td></td>
<td>Added cover page product summary table.</td>
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<tr>
<td></td>
<td></td>
<td>Removed Section 1: Evaluation board compatibility.</td>
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<tr>
<td>02-Aug-2018</td>
<td>3</td>
<td>Updated cover page features.</td>
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<tr>
<td>28-Feb-2019</td>
<td>4</td>
<td>Updated cover page features and product summary table.</td>
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<tr>
<td>26-Jul-2019</td>
<td>5</td>
<td>Updated cover page features.</td>
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