Technical Article
Make Your Bluetooth® Low Energy Solution Fast, Simple and Secure with New Bluetooth 4.2 Certified Software

TEXAS INSTRUMENTS

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Expanding its leadership in *Bluetooth®* low energy solutions (previously known as Bluetooth Smart), TI is pleased to announce the availability of its latest Bluetooth low energy software development kit (SDK), BLE-Stack 2.2 software. The new royalty-free SDK is **Bluetooth 4.2 certified** and includes all 4.2 core stack features which include: higher throughput, enhanced privacy and improved security. In addition, it also includes **simple network processor** functionality, which makes it quick and easy to add secure Bluetooth low energy wireless connectivity to any embedded system with a host microcontroller (MCU). With these new features and a wide range of included sample applications, this new SDK simplifies Bluetooth low energy product development and also allows for reduced overall system cost. It runs on the latest SimpleLink™ CC2640 and CC2650 low power wireless MCUs featuring an ARM® Cortex®-M3 processor with automatic power management and a highly flexible radio capable of supporting future Bluetooth low energy standards. The new SDK is supported by TI's Bluetooth low energy LaunchPad™ development kit , SensorTag kit and remote control kit enabling the creation of standalone system-on-chips (SoC) to flexible network processor applications.

BLE-Stack 2.2 software is unique in that it supports *all* Bluetooth 4.2 core specification features: LE Secure Connections, LE Data Length Extension and LE Privacy 1.2 along with comprehensive Bluetooth 4.1 features including flexible multi-role capability with up to eight simultaneous master or slave connections. Most competing solutions support only a subset of Bluetooth 4.2 and 4.1 features, limiting scalability and product innovation.

Key Benefits of TI BLE-Stack 2.2 Software:
- Higher security and enhanced privacy
- 2.5x higher throughput
- Voice-over-BLE capability
- Simplified development with simple network processor mode
- Lower system cost with mode to eliminate 32 kHz crystal

Key features of Bluetooth 4.2

Higher Security

provides FIPS-approved encryption to ensure data remains confidential and devices are only allowed to be used by authenticated users. It strengthens pairing and link layer security by closing previous known man-in-the-middle and passive eavesdropping vulnerabilities in older versions of the Bluetooth specification. Bluetooth low energy Secure Connections are based on Diffie-Hellman Elliptic Curve Key Exchange, similar to the secure simple pairing feature in classic Bluetooth. The enhanced security provided by Bluetooth 4.2 adds a new level of trust to everyday products, such as medical continuous glucose meters, blood pressure meters, automotive keyless entry systems, door locks, payment terminals and many more.

Figure 1. Building automation applications including smart door locks and smoke detectors

Higher Throughput

enables continued voice-over-BLE innovation and faster firmware upgrades with the Bluetooth LE Data Length Extension feature which provides up to **2.5x faster data transfers** as compared to the previous specifications.

Enhanced Privacy

provides a new level of control to users and enables them to avoid from being tracked by unknown or untrusted devices. The enhanced privacy feature of Bluetooth 4.2 allows Bluetooth accessories share their unique address with only trusted devices while reducing power consumption by blocking inquiries from other devices. This prevents potential invasion of privacy for users and allows location and asset tracking applications to be more trustworthy and user-friendly.

Figure 2. Enterprise and industrial applications such as retail beacons and asset tracking

Ease of Use

TI BLE-Stack 2.2 **simple network processor** mode allows for quick and easy addition of secure Bluetooth low energy wireless connectivity to any embedded system by providing a simple API to drive the CC2640 wireless MCU from a host microcontroller. The complete Bluetooth low energy controller, host and a simple network processor interface layer resides on the CC2640 wireless MCU, while a light network processor driver library resides on an external MCU connected to CC2640 device via a standard serial connection. Developers can leverage this mode to reuse years of technology developed on embedded MCUs and easily add wireless connectivity to their system without going through the learning curve of Bluetooth low energy wireless protocol and software stacks.
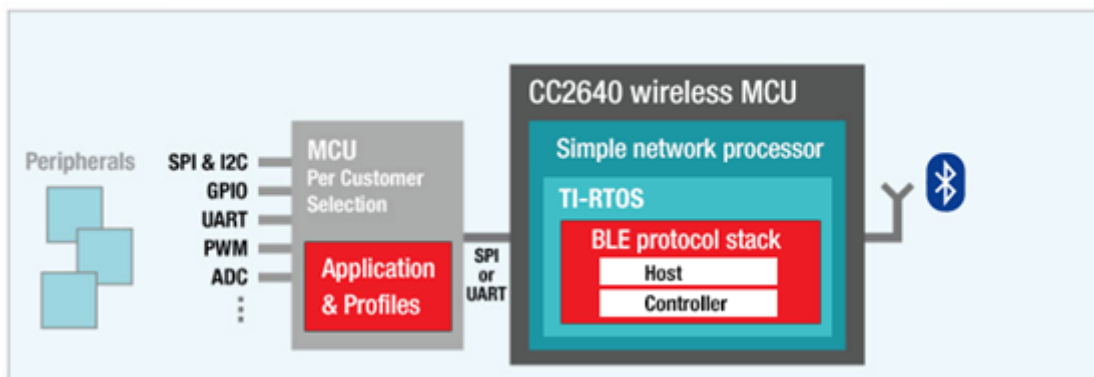
Learn more about Bluetooth 4.2 security features in the next blog in this series:

*   How Bluetooth® 4.2 can help enable product security

Where to Go Next?
*   Download the new BLE-Stack 2.2 software.
*   Order a the Bluetooth low energy LaunchPad development kit.
*   Create your voice remote control with the CC2650RC development kit.
*   Check out our online training with SimpleLink Academy.
*   Got a question? Ask our experts.

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