what is Bluetooth?

How It Works

Bluetooth is the foundation for transformative wireless connectivity

Bluetooth 101

A *Bluetooth*® device uses radio waves instead of wires or cables to connect to a phone or computer. A Bluetooth product, like a headset or watch, contains a tiny computer chip with a Bluetooth radio and software that makes it easy to connect. When two Bluetooth devices want to talk to each other, they need to pair. Communication between Bluetooth devices happens over short-range, ad hoc networks known as piconets. A piconet is a network of devices connected using Bluetooth technology. When a network is established, one device takes the role of the master while all the other devices act as slaves. Piconets are established dynamically and automatically as Bluetooth devices enter and leave radio proximity. If you want a more technical explanation, you can read the core specification or visit the Wikipedia page on Bluetooth for a deeper technical dive.

Bluetooth allows high quality streaming

One of the most popular applications for Bluetooth historically has been wireless audio—headsets and hands-free connectivity in cars to wireless speakers and headphones that stream music from your phone or tablet. This uses a version of Bluetooth called BR/EDR (basic rate/enhanced data rate) that is optimized for sending a steady stream of high quality data (i.e. music) in a power efficient way.

Bluetooth allows creation of smaller sensors

With the advent of Bluetooth with low energy functionality (Bluetooth Smart or BLE), developers are now able to create small sensors that run off tiny coin-cell batteries for months, and in some cases, years. Many of these Bluetooth sensors use so little energy that developers are starting to find ways to use scavenged energy, like solar and kinetic, to power them—a potentially unlimited life from a power perspective. This allows you to find Bluetooth technology in billions of devices today, everything from phones to headsets to basketballs and socks—the use cases are limited only by a developer's imagination.

BR/EDR and Bluetooth with low energy are fundamentally different. Bluetooth with the low energy functionality is built on an entirely new development framework using Generic Attributes, or GATT. GATT is extremely flexible from a developer's perspective and can be used for just about any scenario. As a result, Bluetooth not only connects devices together in an ultra-power efficient way, but also directly connects devices to applications on your smartphone, PC or tablet. It's the low energy and GATT features which are at the heart of the current IoT boom. They are also at the heart of Bluetooth, making it the perfect fit for the IoT.

Bluetooth opens doors to a new generation of "connectionless" devices

On 6 December 2016, Bluetooth took a massive leap forward to deliver advanced beacon and location-based capabilities in home, enterprise and industrial environments. Bluetooth 5 quadruples the range, doubles the speed, and boosts broadcast messaging capacity by 800%—the key to enabling robust, reliable Internet of Things (IoT) connections that make full-home and building and outdoor use cases a reality.