

## Tech Bytes - What is Bluetooth®?

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We see it everywhere nowadays, our vehicles, phones, headsets, speakers, and so much more. So, what do we really know about it? And more importantly, how does it work? According to Wikipedia.org, “Bluetooth is a wireless technology standard for exchanging data over short distances from fixed and mobile devices and building personal area networks.” Distances range from 30 feet to 300 feet, depending on the class of the Bluetooth. Most common are class 1 and class 2 with class 3 the least common. Bluetooth technology was created in 1994, as a wireless alternative to data cables by exchanging data using radio transmissions.

So, how does it work? Bluetooth devices use radio waves instead of wires or cables to connect to a phone or a computer. 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 two to eight devices connected using Bluetooth technology. One device will take the role of master, and all other devices will act as slaves.

There are many variations of Bluetooth and the most popular is the BR/EDR (*bit rate/enhanced data rate*). This is what we commonly see in headsets and hands-free connectivity in cars, wireless speakers and headphones. It is optimized for sending a steady stream of high quality data in a power efficient way.

Another variation that has become popular is Bluetooth Smart or BLE (Low Energy). You will find this in products for health and fitness, beacons, and smart home devices. Developers are now able to create small sensors that run off tiny coin-cell batteries that last for months and even years. These Bluetooth sensors use very little energy and developers are starting to find ways to use solar and kinetic to power them.

Many new smart home products are on the market that use Bluetooth Smart (Low energy). With a phone, laptop or tablet in hand, homeowners can control the lights, temperature, household appliances, window and door locks and security systems. Plus all the cool new kitchen gadgets that claim that they can help you cook better!

Retail stores are getting in the action too. They use beacons, or ibeacons (small objects transmitting location information to smartphones and powered by Bluetooth low energy) to market to consumers, and for indoor navigation and contactless payments. You can download the store’s app, walk into the store, and receive coupons on your phone! And who doesn’t love a discount?

Bluetooth is continuing to evolve and improve. Bluetooth 5 will be coming out later this year or early next year. Bluetooth 5 will offer quadruple the range, double the speed and increase broadcasting capacity by 800%. Bluetooth is the future and we will be seeing a lot more of it.

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