

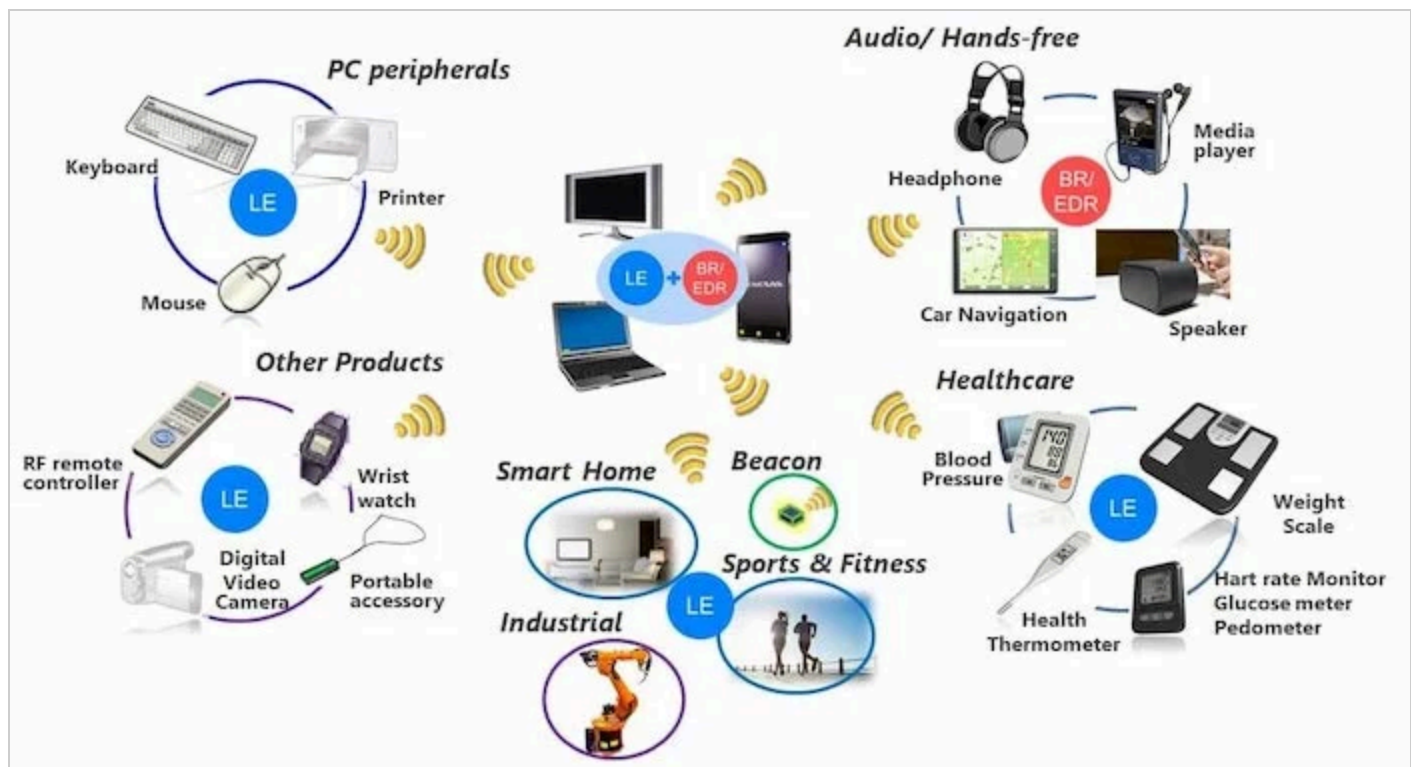
News

The Story of Bluetooth: The Slow Road to Becoming an Industry Standard

July 03, 2021 by [Lianne Frith](#)

Bluetooth seems like a commonplace technology in 2021; however, this wasn't always the case. What did the slow adoption of this industry-standard technology look like?

Today, Bluetooth technology is everywhere, with manufacturers from every sector turning to it for universal and reliable short-distance communication. It's in our smartphones, TVs, cars, security systems, and more, connecting billions of devices. However, it didn't always use to be that way.



Examples of Bluetooth LE applications. Image used courtesy of [Renesas](#)

When Bluetooth was [created over 25 years ago](#), it had a much more limited scope, and adoption was slow. However, thanks to the multinational conglomerate of corporations who continue to support and develop it, Bluetooth has come a long way. Now it is an industry standard that looks set to be with us for many years to come, but how exactly did it get here, and why was the adoption so slow to take off?

The Origins of Bluetooth Technology

Bluetooth technology was developed by Swedish telecom company Ericsson [back in 1994](#). Ericsson's research and development team investigated ways to connect computers and mobile phones without cables and wanted to invent an open specification for wireless technologies at short range. The Bluetooth standard was named after an ancient King of Denmark, [Harald Blaattand \(Bluetooth\)](#), hoping that the technology would unite devices as he had united Scandinavia.

Ericsson soon realized that implementing a far-reaching, universal protocol would require a massive amount of global cooperation. So, in 1998 Ericsson founded the [Bluetooth Special Interest Group](#) (SIG) in collaboration with Nokia, IBM, Intel, and Toshiba. The group had 4,000 members by the end of its first year, and the first formalized technical specification landed in 1999. The group now manages advocacy, legal issues, test processes, compliance, and, of course, publication of the specifications.

Key Technical Specs of the Bluetooth Standard

Bluetooth is a short-range wireless technology standard that exchanges data between fixed and mobile devices over short distances. At its inception, the technology was designed to replace RS-232 telecommunication cables by using short-range UHF radio waves in the ISM bands between 2.4 and 2.485 GHz. The [Bluetooth specification](#) is a packet-based protocol with a master-slave architecture.

	Bluetooth 1.0 (1999)	Bluetooth 2.0 + EDR (2004)	Bluetooth 3.0 + HS (2009)	Bluetooth 4.0 + LE (2013)	Bluetooth 5 (2017)
Max Connection Speed	0.7 Mbps	1 Mbps core 3 Mbps with EDR	3 Mbps with EDR (24 Mbps over 802.11 link)	3 Mbps with EDR 1 Mbps Low Energy	3 Mbps with EDR 2 Mbps Low Energy
Typical Max Range	~10 m (33 ft)	~30 m (100 ft)	~30 m (100 ft)	~60 m (200 ft)	~240 m (800 ft)

A comparison of the different Bluetooth standards. Image used courtesy of [Android Authority](#)

When it comes to hardware requirements, Bluetooth devices need two key components: a radio and a baseband controller. When Bluetooth devices come within one another, an electronic conversation occurs, and the two devices form a network known as a piconet. Alternatively, devices can pick up advertising packets and select whether they are from appropriate devices.

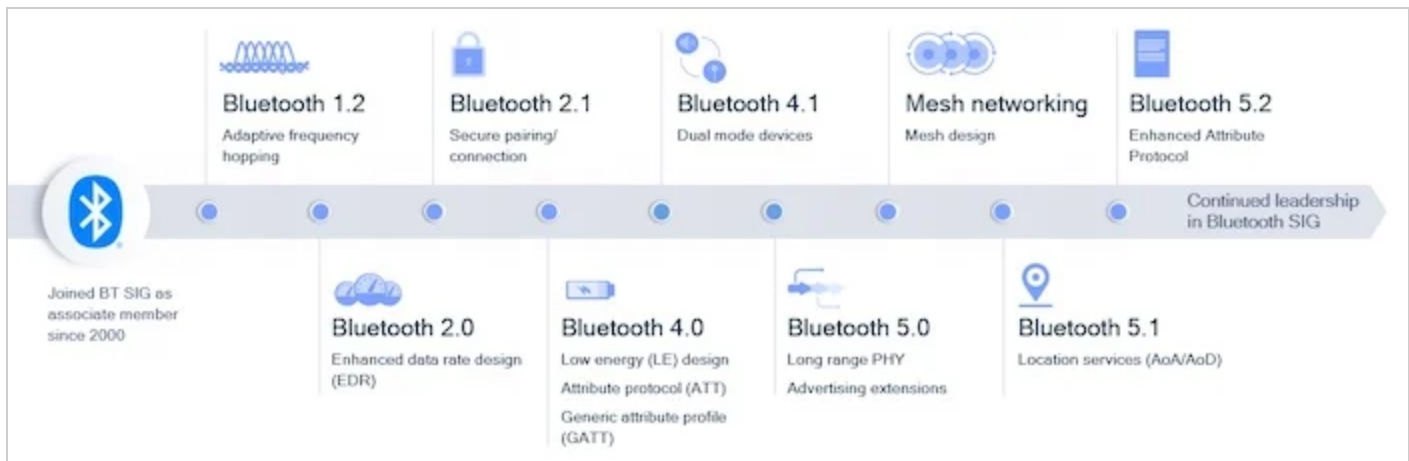
What Was the Hold-up?

Despite the initial interest in using Bluetooth technology to eliminate annoying cables, it didn't catch on immediately.

The first problem was that the standard only worked at around 10m maximum and topped out at 721 Kbps, so it didn't have a range or speed advantage. Bluetooth was then attributed as the primary contributor to why phone batteries dropped during the day, even when not in use.

Secondly, users worried that Bluetooth technology would interfere with networks confirming the 802.11b WLAN standard.

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Examples of Bluetooth advancements since 2000. Image used courtesy of [Qualcomm](#)

It wasn't until 1999 that the first consumer Bluetooth device hit the shelves, the hands-free Ericsson T39 mobile headset. This release was shortly followed by IBM's ThinkPad, the first notebook with integrated Bluetooth that would allow phones and computers to be synced wirelessly.

By 2001, the first stand-alone [GPS receiver was launched](#) along with Bluetooth mice, printers and keyboards as computers increasingly gained Bluetooth abilities through add-in cards and USB dongles.

In 2010, Bluetooth's 4.0 release saw a low-energy version that was more power-efficient. Bluetooth Low Energy (BLE) allowed battery-operated accessories like fitness sensors and healthcare devices to hit the mainstream, working for years on a single coin cell battery.

With the emergence of IoT and more connected devices, Bluetooth took the next leap into a new standard.

Bluetooth Today

As the momentum picked up for Bluetooth, its standard had to adapt to keep up with technological advancements. Since its inception, the Bluetooth standard has undergone many updates regarding data speeds, connection quality, and feature sets, which has helped it accommodate new use cases and markets.

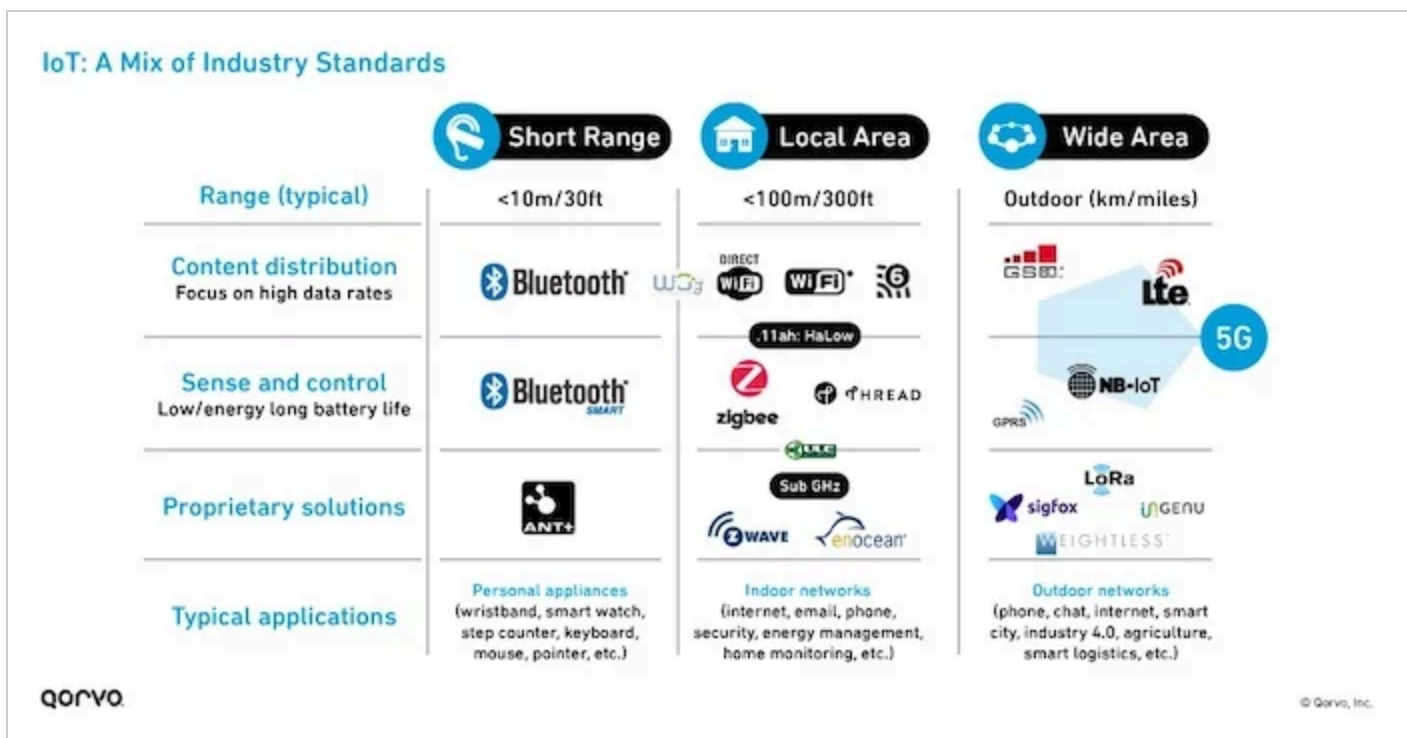
Recently, Bluetooth SIG has been looking at mesh networking, lower energy profiles, and longer-range applications for IoT devices. [Bluetooth's latest revision](#), 5.0, has split improvements for classic and low energy Bluetooth applications with a strong emphasis on boosting range and data rates.

The standard is now challenged with retaining backward compatibility while also powering increasingly low-energy IoT devices, which wasn't originally part of the plan.

Most conversations lately concerning Bluetooth have to do with components and standard improvements; however, one crucial consideration is how does Bluetooth stack up to alternatives?

Will the Future Be Bluetooth?

Constant innovations of wireless technology, like Wi-Fi and 5G keep Bluetooth on its toes. Even with the competition, Bluetooth has come a long way since 1994.



A basic breakdown of IoT standards. Image used courtesy of [Qorvo](#)

Further developments are sure to come, especially when Bluetooth 6.0 rolls around. However, another contender has appeared in the world of wireless technology [Ultra Wide Band](#) (UWB). UWB is steadily gaining traction, covering the high-speed data transfer use case.

At the moment, all these technologies coexist peacefully, although there may well be clashes down the road as our lives and the objects in them become ever more connected.

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