

BLUETOOTH[®] TECHNOLOGY OVERVIEW

Definition

Bluetooth wireless technology is the global short-range wireless standard for personal connectivity of a broad range of electronic devices – from mobile phones and headsets to cars, MP3 players, cameras and printers. The technology is now available in its fourth version of the core specification and continues to develop, building on its inherent strengths – small-form factor radio, low power, low cost, built-in security, robustness, ease-of-use, and ad hoc networking abilities.

Specification Version

The Bluetooth SIG adopted *Bluetooth* Specification Version 2.0 + EDR (Enhanced Data Rate) in November 2004. In March 2007, the Bluetooth SIG announced *Bluetooth* Core Specification Version 2.1 + EDR (Enhanced Data Rate) which adds improved pairing and lowers power consumption. The Bluetooth SIG is currently working on the next version of the technology which will incorporate ultrawideband technology as a high-speed alternative for manufacturers and Wibree technology as an ultra low power version of the specification

Specification Make-Up

Unlike many other wireless standards, the *Bluetooth* wireless specification gives product developers both link layer and application layer definitions, which supports data and voice applications.

Spectrum

Bluetooth wireless technology operates in the unlicensed, 2.4 GHz ISM band.

Interference

Bluetooth wireless technology's Adaptive Frequency Hopping (AFH) capability was explicitly designed to reduce interference between wireless technologies sharing the 2.4 GHz spectrum. AFH works within the spectrum to take advantage of the available frequency. This is done by detecting other devices in the spectrum and avoiding the frequencies they are using. This 'adaptive hopping' allows for more efficient transmission within the spectrum, thereby providing the user with greater performance, even if using other technologies along with the *Bluetooth* wireless technology.

Range

Class 2 radios – most commonly found in mobile devices – have a range of 10 meters or 30 feet
Class 1 radios – used primarily in industrial use cases – have a range of 100 meters or 300 feet

Power

The most commonly used radio (class 2) uses 1mW of power; *Bluetooth* wireless technology is designed to have very low power consumption; the specification reinforces this by allowing radios to be powered down when they are not active.

Data Rate

3Mbps

Other Interesting Stuff

NAME

"Bluetooth" refers to Harald Blatland, the 10th-century Danish king who unified the Danes and Norwegians.

PAN

Bluetooth wireless technology allows devices to fluidly form connections for communicating one-to-one or for creating a wireless personal area network (PAN). A PAN is often described as the 10-meter-radius bubble inside of which all of your devices equipped with *Bluetooth* wireless technology can interact and communicate without physical connections.

PICONETS

PAN's are also called piconets, or "small networks," formed with one to seven other *Bluetooth* devices that have the same *Bluetooth* profile. A particular *Bluetooth* device can be a member of any number of piconets at any moment in time.

HOST/GUEST

Each piconet has one host, the device that first initiates the connection. Other participants in a piconet are guests.

CONNECTIONS

The three types of connections (piconet formations) are:

Data-only: When communicating data, a host can manage connections with up to seven guests.

Voice-only: When used for voice communication (for example, a wireless phone connection), the host can handle no more than three guests.

Data and voice: A piconet transmitting both data and voice can exist between only two devices at a time.