

The Impact of Bluetooth Technology on the Wireless Communications

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ABOUT THE STUDY

Bluetooth technology is a short-range wireless communications technology that allows a person to hold a phone call using a headset, utilize a wireless mouse, and synchronize information from a mobile phone to a PC all while using the same core system. The unlicensed ISM band centered at 2.4 gigahertz is used by the Bluetooth RF transceiver (or physical layer) (the same range of frequencies used by microwaves and Wi-Fi). To fight interference and fading, the core system uses a frequency-hopping transceiver. An RF design known as a "star topology" is used to manage Bluetooth devices.

A piconet is a group of devices that have been synchronized in this way. It will have one master and up to seven active menials, with extra menial that is not actively participating in the network. (A device can also be a master or a slave in one or more piconets.) The physical radio channel in a piconet is shared by a collection of devices synchronised to a common clock and frequency-hopping pattern, with the master device supplying synchronization references. Assume the master device is smartphone. Menial refer to all of the other devices in the piconet. This could include things like your headset, GPS receiver, MP3 player, and car stereo.

A piconet's devices use a certain frequency-hopping pattern that is determined algorithmically by the master device. The fundamental hopping pattern is a pseudorandom ordering of the ISM band's 79 frequencies. The hopping pattern can be tweaked to eliminate some of the frequencies used by interfering devices. When static (nonhopping) ISM systems, such as Wi-Fi networks, are in close proximity to a piconet, the adaptive hopping technique improves Bluetooth technology's coexistence. The physical channel (or wireless link) is divided into slots, which are time units. Packets of data are sent between Bluetooth-enabled devices and are positioned in these slots.

Data packets are sent between Bluetooth-enabled devices and are positioned in these slots. Frequency hopping occurs between packet transmission and reception, allowing packets from a

single transmission to be transferred over many frequencies within the ISM band. The physical channel also serves as a transport for one or more logical links that carry synchronous, asynchronous, and broadcast traffic. Each sort of link has a distinct purpose. For example, synchronous traffic is used to transport hands-free audio data, but asynchronous traffic is used to transport data that can survive more uncertainty in delivery timing, such as printing a file or synchronising your phone and computer calendars.

The technique of connecting wireless devices is one of the more complicated aspects of wireless technology. Users have grown accustomed to inserting one end of a cable into one device and the other end into the complimentary device when connecting connected gadgets. The principles of device "inquiry" and "inquiry scan" are used in Bluetooth technology. Scanning devices listen for devices that are actively enquiring on known frequencies. When an inquiry is received, the scanning device responds with the necessary information for the inquiring device to determine and show the nature of the device that has recognized its signal.

Let's imagine a person want to print a photo from the phone to a nearby printer wirelessly. In this situation, they go to phone's photo and choose print as a method of delivering the photo. The phone would start looking for nearby devices. The printer (scanning device) would respond to the query and, as a result, show on the phone as a printing device that could be used. The printer indicates that it is ready to accept the connection by responding. When you choose a Bluetooth wireless printer, the printing process begins by establishing connections at upper layers of the Bluetooth protocol stack that manage the printing function in this case.

All of this complexity occurs without the user being aware of anything other than the task at hand, such as connecting devices and conversing hands-free or listening to high-quality stereo music on wireless headphones, as it does with any successful technology.

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