

A Businessman's Comparison of Bluetooth and Wi-Fi

Much has been said about the merits of each versus the other, but comparing the two as competing protocols would be a mistake. These technologies were designed to fill different roles on different devices. To understand why these technologies are not competing for the same implementations, we must understand the specific parameters and constraints under which each protocol was designed.

	Wi-Fi (802.11b, g, a)	Bluetooth
Design Mantra	Fast and Ethernet compatible	Cheap, small, low power
Maturity State	Mature	Emerging
Power Requirements	High. Too much power for a phone or handheld-sized devices battery. In iPaq installations, requires a specifically low voltage Wi-Fi card, and an external battery.	Low. Can work effectively off an existing phone or PDA's battery.
Size Of Transceiver	Currently, PCMCIA sized.	1" squared
Cost Per Transceiver Chip	Currently ~\$40 and dropping	<\$10 and dropping
Range	300 < x < 1200ft depending	< 30ft
Throughput (Incl. Overhead)	Up to 11MB (802.11b) or 54MB (802.11a, 802.11g)	1.2MB
Interoperability Among Brands Connection	Good Persistent IP based	Predicted to be good

It is very common to hear someone say that Wi-Fi is better than Bluetooth because 11MB is better than 1.2MB, or because 1200ft range is better than 30. These people are making decisions on partial information. One could just as easily incorrectly generalize that Bluetooth is better since it uses less power and has a smaller footprint.

As it happens, both Wi-Fi and Bluetooth meet their design requirements well, but they were not designed to fill the same role. Wi-Fi and Bluetooth are like motor oil and pepperoni. If you're making a pizza, one is better, but if you're lubricating a car, try the other.

Bluetooth is better suited for:

- ??Installation into low-power devices like phones and PDAs
- ??OEM installation into devices cheaper than \$300
- ??Applications where high-bandwidth (>700k) isn't necessary
- ??Connecting phones to PDAs for one click dialing, data exchange
- ??Synchronization of multiple devices in a Personal Area Network
- ??Printing from PDAs
- ??Eliminating wires and cables on handhelds
- ??Hands-free units for phones
- ??Eliminating data cables between cellular phone modems and laptops
- ??E-mail without attachments
- ??Localized content serving to handhelds (ex: in-store promotions, train schedules at a station)

Wi-Fi is better suited for:

- ??LAN applications where high bandwidth (>2MB) is desirable
- ??Applications where greater range is desirable
- ??Applications where reliability is needed
- ??Retrofitting existing equipment
- ??E-mail with attachments
- ??Web browsing
- ??File sharing

An example of the fact that the two protocols serve different purposes, UPS has recently decided to completely re-build their legacy wireless and mobile systems and replace them with both Bluetooth and 802.11b. In Sept 01, Bluetooth will begin to replace cables between handheld "button" readers and belt-clipped processors, and 802.11b will connect devices to back-end hardware, and trucks to tablets.

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