

## Bluetooth WiFi and IrDA comparisons

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In previous articles, we had talked about Bluetooth technology. Here we will look at complementing (or competing) technologies and issues surrounding Bluetooth.

Despite the hype, Bluetooth is struggling towards widespread release while other similar technologies like Wi-Fi (IEEE 802.11b) has enjoyed surprising mainstream support. Subsequent delays, over-hype and the market maturity of Wi-Fi have led some people to question the need for Bluetooth. However Hewlett-Packard and other companies have designed modules that contain both Bluetooth and Wi-Fi, allowing notebook computer users to construct their network based on their needs.

Different roles. The support for both technologies has led people to presume that Bluetooth was trying to become a wireless LAN rival. But Wi-Fi and Bluetooth are designed for different roles.

Wi-Fi is a wireless local area network (LAN) that connect devices directly to established Internet network. Bluetooth, on the other hand, links devices through an ad hoc connection of radio waves. Bluetooth is expected to be used as a cable replacement for devices such as personal digital assistants (PDAs) and mobile phones. As for Wi-Fi, it is for use in higher speed wireless Ethernet access.

Bluetooth sends and receives information at one megabit per second (Mbps) while Wi-Fi is closer to a high-speed cable modem or digital subscriber line (DSL). In addition, Wi-Fi has a much wider range, up to 300 feet, compared to 30 feet for Bluetooth. The trade-off for the faster transmission rates is that Wi-Fi uses much more power than Bluetooth.

The good news is that the industry has realised that both Bluetooth and Wi-Fi wireless technologies have their own roles to play, and can complement each other. Microsoft, for example, plans to support Bluetooth in future Windows XP

operating system releases. Windows XP currently only supports Wi-Fi.

IrDA. The other technology is infra-red data association or simply known as IrDA. Basically, IrDA is used to provide wireless connectivity technologies for devices that would normally use cables for connectivity. One of the differences between IrDA and Bluetooth devices is the latter does not require a line-in-sight to transmit data. IrDA is designed to operate over a distance of up to one metre and at speeds of 9,600 bits per second (bps) to 16Mbps.

The current data rates for IrDA is up to 4Mbps while 16Mbps is under development. IrDA has a wide range of hardware and software support, and backward compatibility between successive standards. Some of the devices that utilise IrDA are notebooks, PDAs, printers and mobile phones.

The main function of both IrDA and Bluetooth is data exchange. This means, among others, transmitting data from a mobile phone to a PDA. Both technologies use the same upper layer protocol to implement these applications. Therefore, it is possible for a single application to run over both Bluetooth and IrDA. But there are instances when IrDA is more suitable than Bluetooth and vice versa.

One scenario is when exchanging information in a large conference room. Here, there may be many people carrying wireless devices in the room, possibly attempting to do the same thing at once. This is where IrDA can help. The short-range and line-in-sight of the IrDA devices allow the user to aim, in a point-and-shoot style at the intended recipient without interference. In this situation, Bluetooth has problems discovering the intended recipient. A Bluetooth device must perform a time-consuming discovery operation that will find many of the other devices in the room. The user will be forced to choose from a list of discovered devices.

But there are situations where Bluetooth will excel. For example, users can synchronise their mobile phones with a computer without positioning them in a fixed location, unlike using the IrDA.