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Ultra-low-power Bluetooth: the new wireless frontier

A new flavor of Bluetooth might be just the answer.

Michael Foley (Network World) | 18 October, 2007 09:25

The wireless revolution sweeping consumer electronics has manufacturers of devices that need long life from a small battery struggling to find a complementary wireless technology. Makers of sensors for sports, health and fitness are in this camp, while manufacturers of products like watches have never even considered going wireless because of the limited options available.

Several wireless technologies have tried to address the needs of the long-battery-life market, but most have been proprietary and have garnered little industry support. ZigBee, with a consortium of manufacturers behind it, is one of the few exceptions. However, none of these technologies let smaller manufacturers plug in to a global standard.

What's more, today companies that want to make their small devices wireless must also build and sell either a dedicated display unit or an adapter that connects to a computing platform such as a mobile phone, PC or iPod. There have been few successful products that have followed this route to market.

A new flavor of Bluetooth might be just the answer.

With more than 1 billion Bluetooth-enabled devices shipped, including more than 50% of mobile phones sold worldwide, Bluetooth wireless technology is the solution of choice for connecting consumer electronic devices. Over half of consumers in many European and Asian countries already own at least one Bluetooth-enabled device, and the brand is recognized by a majority of consumers worldwide.

Bluetooth wireless technology has established the standard for usability, ease of setup and compatibility across all manufacturers. A well-established set of Bluetooth profiles define the communication needs for a wide range of applications, making it easy for a manufacturer to add Bluetooth wireless connectivity to new devices -- from phones to headsets to printers -- with a minimum of programming and testing work.

Bluetooth technology's years of software development, testing and validation experience, and consumer brand recognition are a tremendous advantage for any device that bears the Bluetooth logo. The current Bluetooth radio delivers a combination of fast data rate and low power consumption that has proven to be right for a range of mobile phone and PC applications, including hands-free communication, streaming music, printing and file transfer. But its speed is wasted in applications that require only small bits of information to be sent.

The Bluetooth Special Interest Group (SIG) recognizes that no single radio design will ever offer both maximum data rate and maximum battery life. With this in mind, the Bluetooth SIG has focused efforts on uniting several wireless technologies under a single Bluetooth wireless umbrella.

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At the same time the SIG was focusing on unification of wireless technologies, engineers at Nokia were developing a complementary radio technology called Wibree that uses a small fraction of the power consumed by the Bluetooth radio. Wibree shares many similarities with the Bluetooth radio and is easily made compatible with Bluetooth radio chips.

In June 2007, the Bluetooth SIG announced it would bring Nokia's Wibree under the Bluetooth umbrella to create an ultra-low-power version of Bluetooth wireless technology. The result: a wireless technology with the same low power consumption and tremendous battery life as ZigBee, but able to communicate with the hundreds of millions of Bluetooth devices shipping each year.

Development of ultra-low-power Bluetooth technology is currently under way, and the Bluetooth SIG expects to announce the first version of the specification in early 2008 with chip shipments following closely behind. Consumers should be able to purchase the first ultra-low-power Bluetooth-enabled products by fall 2008.

In addition to creating a vast market for sensors, watches and other existing devices, ultra-low-power Bluetooth's ability to connect low-power devices to the mobile phone will open new applications. The mobile phone, after all, is quickly becoming the computing hub of the future, combining entertainment, connectivity and data storage in a single device.

With ultra-low-power Bluetooth, for example, it will be possible for mobile phones to support location-based services, allowing users to download schedules from bus stops, product information from a store aisle, or airline schedules from the airport gate.

In the home, the mobile phone could serve as a remote control for the TV, thermostat and even household appliances, or simply direct a smart home to power up or down according to the presence of occupants.

The demand for embedded wireless technology capable of long-lasting, power-independent functionality has existed for some time. Ultra-low-power Bluetooth technology promises a new answer, one with a proven global standard at its heart.

Foley is executive director of the Bluetooth SIG. For more information visit Bluetooth.com or Mike's blog.
