ZigBee would allow remote use of home electronics

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You probably have a mobile phone with a Bluetooth radio in it, and you may have a Wi-Fi network as well. Soon, you could be using a third wireless networking technology in your house.

It's called ZigBee, and it eventually might find its way into more devices than Wi-Fi and Bluetooth combined.

In the near term, you're likely to see it show up in the smart meters that utilities have begun to use and in the remote controls of high-end televisions. In the not-too-distant future, you could be using ZigBee networking to control the lights in your home, monitor your elderly parent's health or turn off your air conditioner during periods of peak energy use when no one's home.

"ZigBee is regarded as a fairly robust, good technology for many applications," said Sam Lucero, an industry analyst at ABI Research, a technology research firm.

ZigBee operates over the same 2.4 GHz frequency range as Wi-Fi and Bluetooth. Unlike those technologies, though, ZigBee transmits at much lower data rates. It's made for sending simple commands, such as turning on a TV, or small bits of data, such as whether a door is locked.

Thanks to the low data rate, ZigBee tends to use far less power than other networking technologies. The battery life of a ZigBee device can often be measured in years, rather than hours in the case of Wi-Fi or

days with Bluetooth.

Also, ZigBee's standard utilizes mesh networking, which allows ZigBee devices to automatically connect with and transmit data through one another without having to go through a central gateway like a router.

ZigBee has been around for about seven years. To date, though, it's primarily been used in commercial and industrial settings in alarm and monitoring systems and in expensive houses for custom-installed home-automation systems.

But the technology's backers -- and analysts who follow the industry -- think it's about to hit the mainstream.

The number of ZigBee radio chips shipped has been doubling every year in recent years, hitting 20 million last year, said Bob Heile, chairman of the ZigBee Alliance, a nonprofit standards body that helps oversee and promote the technology. The group, whose members include Intel, Marvell and Cypress Semiconductor, expects 100 million ZigBee chips to be shipped this year.

Part of that expected growth is driven by power companies. To better track and potentially regulate in-home energy use, PG&E and other utilities are installing millions of smart meters in California and around the country.

All three major power vendors in California plan to include ZigBee radios in their meters, Heile noted. So you may already have a ZigBee-capable device if PG&E has recently upgraded your meter.

The National Institute of Standards and Technology, a federal agency, has recommended that the technology be included in such meters nationwide.

That agency and other ZigBee backers envision it being used to create so-called home-area networks. Such a network might link a thermostat, major appliances and outlets to the smart meter, allowing consumers to closely monitor and control the energy use of particular devices. It could also allow a power company to turn down the air-conditioning in many of their customers' homes at once -- with their customers' permission, of course -- to help prevent a power outage.

ZigBee "has a good chance to be one of the primary technologies in the home for smart-energy management," said Lisa Arrowsmith, a market analyst with IMS Research, which focuses on the electronics industry. "There's a lot of enthusiasm among utilities in the U.S. to proceed down the ZigBee route."

But ZigBee is also likely to start making its way into consumers' homes via their televisions. TV and other consumer electronics manufacturers are developing new remote controls that use ZigBee and other radio-frequency (RF) technologies in place of infrared emitters and sensors.

Infrared is a line-of-site technology that doesn't work if someone or something is in the way, or if you have your remote pointed in the wrong direction. In contrast, an RF remote will work in any direction. And because its signal will pass through obstacles, you could hide ugly or bulky devices like set-top boxes and stereo equipment in a cabinet or another room and still be able to control them.

The advantage of using ZigBee over other RF technologies is that it uses so little power you may need to replace your television before you would have to swap out the batteries in your remote, said Cees Links, who helped develop the Wi-Fi standard and is now CEO of Green Peak, which designs ZigBee chips.

What's more, ZigBee technology could eventually lead to a universal

device to control not only your TV, but everything from your automatic window blinds to your thermostat -- and monitor how much energy you're using at the same time.

Links and other industry figures expect the first ZigBee remotes to hit the market later this year, likely as a premium feature of higher-end televisions.

The consumer electronic industry "will move to RF remote controls," said Craig Mathias, an analyst at Farpoint Group, an advisory firm specializing in wireless technologies. "That is absolutely going to happen."

But Mathias and others caution that ZigBee is competing against a number of other wireless and wired technologies, and there's no guarantee that it will eventually win out. Some manufacturers already use Bluetooth and Wi-Fi in their remote controls. Technologies such as Z-wave and X10 and network-connected power outlets are also being used for home automation and monitoring.

For home area networks, "I don't think there's going to be a clear winner," Arrowsmith said.

Even if ZigBee does emerge as the dominant technology, it could be many years before consumers have more than one or two ZigBee devices in their homes, because the appliances that are likely to use it get replaced infrequently.

"Are you going to trade in your fridge so you can control it by remote?" says Ken Dulaney, a mobile technology analyst with Gartner, a market research firm.

More information: www.zigbee.org/