

## BLUETOOTH TO GET EVEN SMARTER IN 2016

Bluetooth is evolving quickly. Having cemented its status as the leading personal area network (PAN), the technology is extending its reach, as well as that of its users, into the home through a set of enhancements expected to appear during 2016.



The core Bluetooth Smart protocol, developed to support low-energy communications, has made it possible to give battery-powered sensor modules the ability to communicate directly with smartphones and tablets. In principle, the range of Bluetooth Smart is limited to 10m, which is plenty for accessing devices in the same room or which are worn on the body.

Devices based on Bluetooth Smart can already do more. Many of them are sensitive enough to receive packets over the air much further away. Changes to the protocol being formulated by the Bluetooth SIG will bring the ability to extend Bluetooth's range four-fold without affecting power consumption.

The changes will, in effect, trade off maximum data rate against range and can be used in the other direction, to provide enhanced data transfers for tasks such as software downloads to sensors and wearables when the master device is nearby.

The ability to be more flexible in terms of range and data rate will be taken one stage further with the development of an extension to Bluetooth for efficient mesh networking. The advantage of mesh networking in home networks is that you can use devices sitting between a smartphone and the one you want an app to access to help get the messages through.

Messages from the smartphone node hop across number of others on the way to the destination device and hop back again. It is a very reliable means of providing connectivity to wireless devices

that because, if one of the relaying nodes fails, it is generally possible to substitute another. It's very much like the internet in that respect. But, unlike the internet, the mesh is better at managing itself.

The mesh gives Bluetooth an important boost in terms of power efficiency when used to extend the range of a network. The chances are that each hop will involve comparatively little transmit power because it's a short hop. And you are far less likely to find that the destination device is completely out of range.

There is another benefit to meshes in smart-home networks. Using conventional networks, if you want to send a message to all the devices of one type in a room – they may be smart light bulbs or active audio speakers – the master needs to send an individual message to each of them. A mesh network can use a technique called 'flooding' in which the device sending the "lights on" command to the bulbs closest to it and those bulbs then relay to their neighbours until the room is lit.

Coming hot on the heels of security enhancements to Bluetooth Smart in release 4.2, which appeared just over a year ago, the upcoming additions will make Bluetooth even smarter and potentially the main choice for both home and personal applications.