Bluetooth Smart: major changes from a small version update

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At first sight the recent update to Bluetooth Smart to version 4.2 does not look that significant. Don't be misled by the 0.1 release change from the previous version. For a point release it has major ramifications not just for Bluetooth but for wearables and the Internet of Things (IoT). The changes signal a big shift in the way that ultra-low-power devices communicate with the internet and open up not just new applications but make others much more convenient and easier to deploy. They enable what researchers a decade ago referred to as "ambient intelligence" – where electronic device cooperate to make our lives easier, safer and smarter. Some changes will make it easier to deliver software upgrades to sensors nodes, to improve their functionality and keep them safe from hack attacks. Although the sensors normally transmit very small amounts of data each time, updates require better bulk data rates, which Bluetooth Smart 4.2 now delivers. But the biggest changes come with other security-related enhancements and the ability of Bluetooth Smart devices to interact with what is likely to be the other key component for the IoT: 6LowPAN. It means Bluetooth wearables and beacons will be able to take advantage of the mesh networking technologies needed for ambient intelligence. In Bluetooth Smart 4.2, a change in the way addresses are resolved for private devices means that the host CPU no longer need be involved. That functionality can now sit inside the Bluetooth controller itself. If a trusted device comes into range, there is no need to wake up the CPU, which helps lower power consumption. It also prevents untrusted devices from getting too much information from devices. Take the example of a crowded airport waiting area or other public place. With older versions of Bluetooth, making a device discoverable – which is something you want when linking your devices together – potentially opened other data it carries. This made it possible for others to check the battery levels of Bluetooth devices around them if that was part of the set of data the device could make public.

Only if the user has decided to ‘trust’ other devices can they now pick up that additional data from a discoverable device, giving the consumer much more control and greater convenience as they can allow their devices to remain discoverable in more situations, which will improve the control on the range of services they can access and increase their privacy.

In addition to the security changes, the ability for Bluetooth Smart devices to access the internet through 6LowPAN will give wearables more autonomy. The user won’t have to carry a smartphone to get the features of a wearable app as the devices can opportunistically access data from other 6LowPAN networks to which it has access. It will allow wearables to control devices, such as the lighting, in the smart home directly. No need to track the phone down. And if you can’t remember where you put the phone, a quick tap could send a signal through the home network to tell it to ring.