

Wireless Standards for the IoT Era

The IoT era will feature a combination of low-power wireless standards like Bluetooth Smart working together with Wi-Fi

The IoT will require network access spread across local and metro networks for cloud connectivity. For local access, some of the possible options are near-field communication (NFC), radio frequency identification (RFID), Wi-Fi (IEEE 802.11), Bluetooth, ZigBee, 6LoWPAN, Flutter and XBee. For longer distances, the backbone or backhaul can be GSM, GPRS, 3G, LTE, WiMAX or Ethernet.

However, at present Wi-Fi and Bluetooth Smart appear to be leading the pack, mainly because systems using these technologies can piggyback on existing infrastructure rather than build a fresh one.

Jithu Niruthambath, director at Calixto Systems Pvt Ltd, agrees that Wi-Fi as an IoT interface is getting a boost due to the widespread presence of Wi-Fi access points. This makes it easy to build an IoT solution with the existing access points. "Till recently, there was no cost-effective way to enable a Wi-Fi interface on microcontrollers, making it less popular for embedded applications. Now, we have a lot of Wi-Fi modules (like CC3xxx from TI), which can support even the tiniest microcontrollers. This is one reason for the greater uptake of Wi-Fi now. Another important point is the availability of Wi-Fi access points in smartphones and tablets. This allows even more opportunities to develop accessories with Wi-Fi interfaces. The Wi-Fi Direct standard is also emerging now. With this, two Wi-Fi enabled devices will be able to talk to each other without an access point. This will also drive a lot of IoT applications," says Niruthambath.

According to Shyam Ananthnarayan, vice president, Marketing, Embedded Product Design, Tata Elxsi, "The critical challenge, however, is that most of the devices have to be extremely low powered (solar powered wherever

possible). So, technologies like Bluetooth Smart (low energy), ZigBee and 6LoWPAN will possibly find wider adoption and implement some of the smart automated mesh networks. The deployment of the IPv6-enabled multimode gateways and dedicated IP address management devices can help to counter the growth of IP addresses."

Nitin Gupta, lead engineer, μ Energy Applications, CSR India Pvt Ltd, feels that Bluetooth is likely to work with Wi-Fi to deliver consumer IoT products due to the huge deployment rates of these technologies. "Smart devices, both tablets and smartphones, are likely to be central to the IoT. For direct consumer control and to gather data from low-power devices, Bluetooth Smart is ideal. With developer APIs available on all the major OS platforms, Bluetooth Smart may provide the first wave of IoT devices. Bluetooth Smart offers rapid roll-out of low-power consumer products around the latest smartphone and tablet platforms creating a large addressable market," he says, adding that the Bluetooth Smart support in Android is also a huge step as Android continues to dominate the market in smart devices.

Gupta also explains about an upcoming improvement to the standard that will make it all the more desirable for IoT applications. The current 4.0 version of the spec enables star topology networks only. This means that a smartwatch can only be master to a set of slave sensors or a slave to a smartphone, but not both master and slave at the same time. For developers, this means that the smartwatch has to switch roles to support both connections. In the 4.1 spec, it will be possible for the watch to be slave to the phone whilst maintaining several slave sensors. ●

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