

A Passive Means to Reduce Wifi Energy Use

Written by Marco Attard
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University of Washington researchers reveal a means to reduce the power consumption involved with wifi networks-- "Passive Wifi" using virtually no energy even when providing data transfer speeds of up to 11Mbps.



For the curious Passive Wifi energy consumption reaches up to 49.28 μW when pushing 11Mbps transmissions. Energy use is even lower during 1Mbps transmissions, being around 14.48 μW . According to the researchers such a rate is 1000x lower than Bluetooth LE and ZigBee, or 10000x lower than existing wifi chipsets.

To achieve such power reductions Passive Wifi involves a redesign of the power-hungry radios making a router, creating a single device users plug into walls. The plug-in device generates a continuous wifi signal which in turn is reflected by passive devices, creating a chain of low-power transmitters.

A test Passive Wifi setup managed to implement all 802.11b bit rates on an FPGA platform, with transmissions decodable by standard smartphones and wifi hardware over distances of 10-100m in both line-of-sight and through-the-wall scenarios.

"Our sensors can talk to any router, smartphone, tablet or other electronic device with a wifi chipset," the researchers say. "The cool thing is that all these devices can decode the wifi packets we created using reflections so you don't need specialised equipment."

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Passive Technology can be useful not only for the extension of mobile device battery lives, but also for the low power devices making the Internet of Things, especially since it sticks with current wifi standards. The researchers already have a commercial partner in Jeeva Wireless, and their full findings will be shown off at the USENIX Symposium on Networked Systems Design and Implementation.

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