

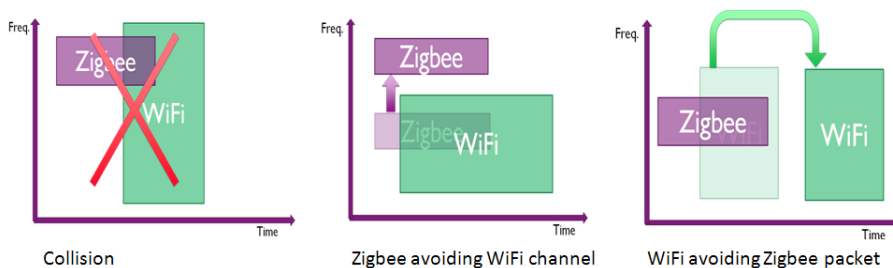
Cross-network cooperation paradigms supporting colocated heterogeneous wireless networks

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Should WiFi care about other technologies? Suppose a truck is only able to see other trucks running on the highway. Would you be willing to ride in a car on the truck lane, knowing that any minute they can collide with you? I guess not. If we look at the way current WiFi and Zigbee devices coexist, this is basically an identical scenario. Zigbee being the cars, and WiFi the trucks. Therefore, ZigBee's current survival strategy is to stay away from the channels WiFi is using. Within this work we enable WiFi to be aware of Zigbee using a Spectral Sensing Engine. This allows Zigbee to operate on the same frequency as WiFi, without harming each others operation. The packetloss occurring due to the coexistence of WiFi and Zigbee is reduced with 99.7%. The resulting high reliability of ZigBee allows it to be used within industrial automation loops, which opens up previously unreachable markets. A study published in DySPAN 2011 shows that this reliability improvement can save a factory 7 million dollars in a 5 year timespan in comparison to regular ZigBee. Moreover, another study published in FITCE 2011 shows that in some circumstance the usage of ZigBee based machine automation is more cost effective than the wired equivalent. One would expect that the uptake of this technology would be roadblock free. However, this is not the necessarily case as the WiFi device manufacturers need to include extra functionality in their devices, which results mainly in increased ZigBee reliability. Therefore the research concluded that sound technology does not necessarily lead to successful real world acceptance.



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