

## Energy Efficient Cooperative Wireless Access

As the wireless spectrum becomes ever more crowded, and the number of devices with wireless capabilities grows, the need for users to cooperate becomes inevitable. Cooperative wireless communications is a new approach to developing solutions for providing interference mitigation, increased data rates, deployment flexibility, and increasingly as a way to achieve significant energy savings. One example is in densely populated urban living environments where the density of WiFi router deployment will be high for the most part. This makes it possible for users to share access points for Internet access in a seamless manner to save energy and cost. By coordinating the wireless routers, it is possible for ISPs to dynamically determine the smallest set of wireless routers that need to be kept on to meet the combined bandwidth requirement of the households, and putting the rest in sleep mode. In the context of the Australian NBN deployment, we believe that such schemes can achieve up to 60-80% energy savings in the wireless access system without any perceptible impact to the users. When signals are cooperatively combined at the physical layer even greater savings are possible.



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