

to increase in node density traffic in the network is more which in turn leads to collisions hence as the node density increases packet received decreases. Fig 10(b). shows the effect on throughput by using omnidirectional, Steerable and Omni Steerable antenna. Throughput of Omni-Steerable is more as it is enabled when the transmission of data enters cooperative mode based on packet reception ratio. Fig 10(c). shows the inequality in delay with three antenna models. Delay using Omni steerable is almost same as other two when node density is less but as the node density increases delay has also increased in small amount as each node needs to switch their antennas to Omni steerable antennas depending on PRR ratio. Omni-steerable antenna outperforms omnidirectional and steerable antenna.

7. CONCLUSION

The paper proposes a COSR protocol to leverage the physical cooperation capability, the protocol also brings coordination between Network layer and Physical layer to effectively utilize the benefits of Cooperative communication and Directional antenna. COSR protocol efficiently selects the relay based on highest residual battery and the only the beam that leads to the highest residual battery node is activated. This results in less energy utilization and improvement in transmission range. The COSR protocol is verified through simulation and the results prove that throughput and total packets received to the intended destination is improved considerably. Cross layer designing of Network layer, MAC layer and Physical layer to take best advantage in establishing cooperative communication is sustained as future work.

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