In Ultra-Wide Band (UWB) ad hoc networks, admission control and resource management are of major concern. The admission control algorithm helps in resolving infeasible power, reduces the congestion, and guarantees the quality of service (QoS) of unlicensed secondary users. The long acquisition time in the UWB transmissions and the near-sender blocking problems can be resolved by resource management effectively. In this paper, an admission control scheme and the resource management in UWB ad hoc routing is proposed. The bandwidth allocation and the bandwidth redistribution methods are employed here for the call admission control. Initially, bandwidth allocation is done using the HCF Controlled Channel Access (HCCA) centralized access which allows the HC to assign Transmission opportunity (TXOPs) to the ACs by taking into account the specific time constraints of each AC. After allocating the bandwidth, the free bandwidth is allocated to the other stations by estimating the traffic load. The call admission control is employed in order to guarantee the QoS. Simulation results show that the bandwidth allocation and call admission control scheme effectively solves the near-sender blocking problems in UWB ad hoc networks and improves achieved throughput and supports best effort traffic.
References

- Francesca Cuomo, Cristina Martello, Andrea Baiocchi and Fabrizio Capriotti "Radio Resource Sharing for Ad Hoc Networking With UWB" IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, VOL. 20, NO. 9, DECEMBER 2002.
- Samer Bali and Prof. Dr. -Ing. Klaus Jobmann "ROUTING PROTOCOLS FOR ULTRA-WIDEBAND MOBILE AD HOC NETWORKS"; 2008.
- Luca De Nardis, Guerino Giancola, and Maria-Gabriella Di Benedetto Power-aware design of MAC and routing for UWB networks; CAMAD&apos;04 Workshop, IEEE Global Communications Conference 2004,
- Maria-Gabriella Di Benedetto and Luca De Nardis "Cognitive routing in UWB networks" IEEE International Conference on UWB 2006 (ICUWB2006),
- Luca De Nardis, and Maria-Gabriella Di Benedetto "Medium Access Control design for UWB Communication Systems: review and trends" JOURNAL OF COMMUNICATIONS AND NETWORKS, VOL. 5, NO. 3, SEPTEMBER 2003
Call Admission Control based on Bandwidth Allocation in Ultra Wide Band (UWB) Ad Hoc Networks

- Jürgen Wolf Stephan Heckmüller and Bernd E. Wolfinger "Dynamic Resource Reservation and QoS Management in IEEE 802.11e Networks" 2005.


Index Terms

Computer Science

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Keywords

Call admission control  Bandwidth allocation  Bandwidth redistribution  UWB ad-hoc networks