

Ad Hoc And Sensor Networks

Exercise 4

Assigned: October 12, 2009

Due: October 19, 2009

1 Dozer

In the lecture the Dozer data gathering system for wireless sensor networks was introduced. Dozer uses a beacon mechanism to announce a node's presence in the network and also to synchronize this node's children with their parent. However, the beacons of a parent and its children are not synchronized. As a consequence, command broadcasts which are piggy-backed on beacon messages need $O(D * t_{interval})$, with D being the maximal tree depth in hops and $t_{interval}$ the length of a beacon interval, to reach all nodes.

- a) Why is Dozer not trying to create a staggered beacon schedule? That is, why are beacon transmission times of a child not coupled to the beacon times of its parent in order to reduce the propagation time of a command?
- b) Assume you are using Dozer for a long-time data gathering application and now the necessity arises for fast broadcasts (initiated by the sink node). Can you change or extend Dozer so that broadcasts with shorter delays become possible while maintaining energy-efficiency? Has the frequency at which command broadcasts are executed an influence on your design?