Abstract

We propose an algorithm to determine stable connected dominating sets (CDS), based on node velocities, for mobile ad hoc networks (MANETs). The proposed minimum velocity-based CDS (MinV-CDS) algorithm prefers slow-moving nodes with lower velocity, rather than the usual approach of preferring nodes with a larger number of uncovered neighbors, i.e., larger density (referred to as MaxD-CDS). The construction of the MinV-CDS starts with the inclusion of the node having the lowest velocity, into the CDS. Once a node is added to the CDS, all its neighbors are said to be covered. The covered nodes are considered in the increasing order of their velocity, for inclusion in the CDS. If a node has lower velocity and is the next candidate node to be considered for inclusion in the CDS, it is added to the CDS if it has at least one neighbor that is yet to be covered. This procedure is repeated until all the nodes in the network are covered. Simulation results illustrate that the MinV-CDS has a significantly longer lifetime compared to MaxD-CDS. MinV-CDS also has a larger number of nodes and edges compared to MaxD-CDS and this helps to reduce the hop count as well as the end-to-end delay and improves the fairness of node usage.
Use of Minimum Node Velocity Based Stable Connected Dominating Sets for Mobile Ad hoc Networks

Reference


Index Terms

Computer Science  Wireless Networks

Key words

Connected Dominating Set

Mobile Ad hoc Network

Node Velocity

Density