

عنوان مقاله:

Introducing a New Weight-Based Heuristic Clustering Method in Mobile Ad-Hoc Networks

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خلاصه مقاله:

Ad-hoc mobile networks (MANET) are free of any structure. In these networks, nodes are not aware of the connections in the network they locate in because the structure of these networks is dynamic. In order to send information to order nodes, each node should discover and reserve the path. Due to their dynamic nature, this type of networks encounters with the design complexity and limitations such as lack of specific communicational infrastructure, change in time, energy and bandwidth limits and the quality and security considerations in the cooperation of nodes. Regarding these issues, bandwidth optimization, power and energy control, and improvement of transmission quality are priorities of this type of networks. Routing is one of the most important challenges in mobile networks. One of the routing methods culminates at the issue of nodes clustering and determination of cluster-heads so that nodes consume lower energy and live longer with implications for longevity of the whole network. In this paper, to solve the power consumption problem and increase the network life-time, we can use the cluster-based routing, which is aimed at clustering the nodes and determining the cluster head in order to reduce energy consumption and increase network lifetime. The most important factors involved in energy consumption in the cluster-based routing include the number of clusters, the number of cluster head changes, the number of routes found between the source and destination nodes in comparison with communication requests, the rate of end-to-end delay, the number of reclusterings and the number of live nodes. Considering the high efficiency of clustering among the routing methods and considering the high efficiency of evolutionary algorithms in clustering, we have tried in this paper to present a new colonial competitive algorithm-based approach for clustering the MANETs, which tries to present an optimal clustering model for MANETs through numerical coding and the use of different special operators. By providing special conditions, this algorithm prevents reclusterings, thereby reducing the overload caused by this operation and reducing energy consumption. We have evaluated the proposed method in three sections including: 1) evaluating the accuracy of the proposed method (including the generalizability, convergence and stability criteria) for three test samples with different numbers of nodes and ranges; 2) evaluation of the reliability of the proposed method (including ... criteria for the number of clusters, number of changes of the cluster heads and number of conn

کلمات کلیدی:

Clustering, Ad-hoc mobile networks, Transmission Quality, Cluster-head, Routing

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