

A Clustering-Based Data Replication Algorithm in Mobile Ad Hoc Networks for Improving Data Availability

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Abstract

In Mobile Ad Hoc Networks (MANET), network partitioning can cause sudden and severe disruptions to ongoing data accesses, and consequently data availability is decreased. A new distributed clustering algorithm is presented in this paper for dynamically organizing mobile nodes into clusters in which the probability of path availability can be bounded. Based on this clustering algorithm, a data replication algorithm is proposed to improve data availability. Theoretic analysis indicates that the algorithm has a proper complexity. Simulation results show that the clusters created by the clustering algorithm have desirable properties and the data availability is improved effectively by the clustering-based data replication algorithm.

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摘要

在移动自组网络中,网络分割现象可能频繁发生,从而降低了数据的可用性.提出了一种新的分布式分簇算法来组织移动节点,算法保证簇内任意两点间路径的可用概率都大于某个确定的界.在此基础上提出了基于稳定路径分簇的数据复制策略,以提高在出现链路断接甚至网络分割时的数据可用性.对算法进行了理论证明和实验分析,实验结果表明,由分簇算法构造的簇能够满足我们所要求的特性,并且基于分簇的数据复制算法

在移动自组网环境中有效地提高了数据的可用性.

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