Abstract

Leader election is the process of electing a node as a coordinator or a leader to the whole distributed system. This paper proposes a new leader election algorithm called: "K-neighbor-based, Energy Aware Leader Election Algorithm (KELEA)"; that works efficiently in the ad hoc distributed systems. KELEA is an energy-efficient algorithm which aims to save energy by reducing the number of exchanged messages. The main idea is to assign every node in the ad hoc network with a unique ID, where the ID represents a performance value such as density and energy. Then maintain a descending-ordered list of nodes according to their IDs. When a node detects a leader crash, it instantiates a leader election process by sending an ELECTION message to only a specific number of neighbouring nodes (K) to participate further in the election process, where K represents a ratio of the whole number of nodes. The paper shows through mathematical analysis and a practical example that the proposed algorithm KELEA outperforms other algorithms that perform election using traditional flooding (i.e. by sending messages to the entire neighbouring nodes). KELEA reduces the message overhead and minimizes energy consumption in comparison with other flooding-based algorithms.

Refer
A K-Neighbor-based, Energy Aware Leader Election Algorithm (KELEA) for Mobile Ad hoc Networks

References

- N. Malpani, J. Welch and N. Vaidya. "Leader Election Algorithms for Mobile Ad
A K-Neighbor-based, Energy Aware Leader Election Algorithm (KELEA) for Mobile Ad hoc Networks

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Index Terms

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Keywords

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