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Security-Oriented Opportunistic Data Forwarding in Mobile Social Networks

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Abstract

In recent years, Mobile Social Networks (MSNs) have been arising a growing interest in both scientific and industrial fields for its potential value. The effective data transmission of MSNs is generally achieved through opportunistic forwarding and node collaboration. However, malicious nodes may illegally intercept and drop the data packets which should be forwarded. Therefore, it is very challenging to detect these malicious nodes. In this paper, we proposed a new Resisting On-Off Attack Data Forwarding Mechanism (OADM) for MSNs to detect the on-off attack, which not only prevents malicious nodes from intercepting data packets, but also exploits the node collaboration to forward data packets. Our major contribution includes: (1) Exploiting Hidden Markov Model (HMM) model to learn node behaviors for the evaluation of attacking probabilities and node states; (2) Effective relay node selection based the estimation of node capability. Results show the proposed OADM can effectively identify the attacking behavior and collaborating states of nodes and significantly improve the data delivery rate of MSNs.

Keywords: Mobile Social Networks; Malicious Behaviour Detection; Trust and Reputation Management; Opportunistic Forwarding

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