



RESEARCH ARTICLE

Secure Position-Based Routing Protocol for Mobile Ad hoc Networks

S. Sivakumar¹, S. Sagunthala²

¹Department of Computer Science, Periyar University, TamilNadu, India

²Department of Computer Science, Periyar University, TamilNadu, India

¹ ssk.pgp@gmail.com; ² sagupersonal@gmail.com

Abstract— *In large and dense mobile ad hoc networks, position-based routing protocols can offer significant performance improvement over topology-based routing protocols by using location information to make forwarding decisions. However, there are several potential security issues for the development of position-based routing protocols. In this paper, we propose a secure geographic forwarding (SGF) mechanism, which provides source authentication, neighbor authentication, and message integrity by using both the shared key and the TIK protocol. By combining SGF with the Grid Location Service (GLS), we propose a Secure Grid Location Service (SGLS) where any receiver can verify the correctness of location messages. We also propose a Local Reputation System (LRS) aiming at detecting and isolating both compromised and selfish users. We present the performance analysis of both SGLS and LRS, and compare them with the original GLS. Simulation results show that SGLS can operate efficiently by using effective cryptographic mechanisms. Results also show that LRS effectively detects and isolates message dropping attackers from the network.*

Key Terms: - *Ad hoc wireless networks; Location service; Geographic forwarding; Position-based routing protocol; Security*

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