Cautious Rating for Trust-Enabled Routing in Wireless Sensor Networks

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Abstract

Trust aware routing in Wireless Sensor Network (WSN) is an important direction in designing routing protocols for WSN that are susceptible to malicious attacks. The common approach to provide trust aware routing is to implement an efficient reputation system. Reputation systems in WSN require a good rating approach that can model the information on the behavior of nodes in a way that represents different sources of this information. In some WSN applications, nodes need to be more cautious in rating other nodes since it may be in a very hostile environment or it may be very intolerant to malicious behavior. Moreover, to prove the creditability of a reputation system or its related rating components, we require a global and system-independent technique that can evaluate the proposed solution. In this work, we introduce a new rating approach called Cautious RAting for Trust Enabled Routing (CRATER). CRATER provides a rating model that takes into account the cautious aspect of WSN nodes. Moreover, we introduce a promising evaluation mechanism for reputation systems called REputation Systems-Independent Scale for Trust On Routing (RESISTOR). RESISTOR can be used to evaluate and compare reputation and rating systems in a global, simple and independent manner. The work involves simulation results that show how RESISTOR is used to evaluate our proposed CRATER rating mechanism.