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ACCEPTED MANUSCRIPT

A New Adaptive Trust and Reputation Model for Mobile Agent Systems

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Abstract

Mobile agents (MAs) are being widely used in distributed applications development. The motivation behind the interest in MAs is derived from the various advantages they offer, such as, autonomous behavior, mobility and intelligence. Also, their small size and requirement of a low bandwidth are other attractive features. However, the dynamic behavior of agents and hosts in Mobile Agent Systems (MASs) has posed a challenging problem. Maintaining good performance is important for MASs to guarantee the quality of provided services. To address both of these issues we propose a new adaptive trust and reputation model for MASs. The proposed model provides users with the means to assess service providers and decision making basis on who to interact with. It combines direct and indirect witnesses' experience evaluations. It also assesses the honesty of witnesses to filter out false evaluations. In addition, new "Incentive and Penalty" and "*Second Chance"* approaches are incorporated into the model to motivate an honest behavior and accommodate changes in the system. A testbed is conducted to show how the system adapts to changes in witnesses' behavior. Also a framework for comparison is also developed to evaluate and compare the proposed model and compare it to other existing models found in the literature.

Keywords: Social Networks, Trust and Reputation, Mobile Agent Security, Dynamic Behaviors, Network Simulation, Evaluation Framework

1. Introduction

Trust and reputation evaluation is a human social behavior performed on a daily basis. Before purchasing a specific product, we collect information to judge how efficient this product is. Collected information comes from different sources such as, sales person, personal opinion, friends, and TV advertisements, etc. Collected information is combined together to form a final judgment about the product in order to make the decision whether to purchase it or not. The same concept

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