DISTRIBUTED TRUST INFERENCE MODEL BASED ON PROBABILITY AND BALANCE THEORY FOR PEER-TO-PEER SYSTEMS

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Submitted: Aug. 1, 2012 ***Accepted: Oct. 30, 2012*** ***Published: Dec. 1, 2012***

Abstract- Researchers have done much around how to measure trust degrees or levels by local and global style in a given distributed network. However, how to infer trust degree for a strange node efficiently in a large-scale distributed environment was little done. This paper focuses on this problem, and proposes a novel trust model based on balance theory and probability theory. We firstly design a simple direct trust model for evidence computing, then construct trust relations network and trust inference network based on direct trust network. In order to discover trusted evidence chains during complex relations, we design two inference rules and propose mathematics models to infer indirect trust value based on Markov chain theory. Simulations proved the rightness and effectiveness in intensive trust relations environment and intensive distrust environment.

Index terms*: trust model, trust inference, peer-to-peer security, distributed system, trusted evidence chain, trust probability, peer-to-peer network.*