

SIFT: A Simulation Framework for Analyzing Decentralized Reputation-based Trust Models

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Abstract: Open decentralized applications are susceptible to the attacks of malicious entities. In such applications, each autonomous entity must adopt protective measures to safeguard itself. One set of such countermeasures are reputation-based trust management systems. However, designing these systems is arduous because the impact of factors introduced by decentralization on such systems is largely unknown. There is a lack of knowledge in existing literature that can guide the design of an appropriate trust solution. To address this shortcoming, we present a simulation-based framework called SIFT that allows a designer to explore and analyze the interplay of various trust and application settings. SIFT-based experiments with various trust and application settings have not only helped expose the pros and cons of different trust settings but also revealed several interesting insights that guide the selection and refinement of a set of trust settings for a given operating condition.