Evidence-based Trust Reasoning

Submitted by jingweihuang on Wed, 09/17/2014 - 6:31pm

Title	Evidence-based Trust Reasoning
Publication Type	Conference Paper
Year of Publication	2014
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Conference Name	Proceedings of the 2014 Symposium and Bootcamp on the Science of Security
Publisher	ACM
Conference Location	Raleigh, NC, USA
ISBN Number	978-1-4503-2907-1
Keywords	ACM CCS, evidence-based trust, Foundations, Modeling, Operating Systems Security, privacy, science of security, Systems Security, Trust Frameworks, trust model, Trusted Computing, Trusted platforms

Abstract

Trust is a necessary component in cybersecurity. It is a common task for a system to make a decision about whether or not to trust the credential of an entity from another domain, issued by a third party. Generally, in the cyberspace, connected and interacting systems largely rely on each other with respect to security, privacy, and performance. In their interactions, one entity or system needs to trust others, and this "trust" frequently becomes a vulnerability of that system. Aiming at mitigating the vulnerability, we are developing a computational theory of trust, as a part of our efforts towards Science of Security. Previously, we developed a formal-semantics-based calculus of trust [3, 2], in which trust can be calculated based on a trustor's direct observation on the performance of the trustee, or based on a trust network. In this paper, we construct a framework for making trust reasoning based on the observed evidence. We take privacy in cloud computing as a driving application case [5].

URL	http://doi.acm.org/10.1145/2600176.2600193
DOI	10.1145/2600176.2600193
Citation Key	Huang:2014:ETR:2600176.2600193