

# Tool Support for Incorporating Trust Models into Decentralized Applications

Mamadou H. Diallo, Girish Suryanarayana, Richard N. Taylor  
Institute for Software Research  
University of California, Irvine  
{mdiallo,sgirish,taylor}@ics.uci.edu

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**Abstract:** The role of decentralized trust and reputation management in the establishment of trust relationships between peers in decentralized applications has been well-recognized. Several reputation-based trust models exist in the literature. PACE is an architectural style for decentralized trust management. PACE provides specific principles that guide the incorporation of trust and reputation models within the architecture of each decentralized peer. However, a software architect using PACE to build a trust-enabled decentralized application must study the trust model being incorporated, then design and build the relevant trust components corresponding to the trust model, and finally integrate them within the PACE architecture. This design process is long and tedious but essential. In order to address this, in this paper, we present an approach that facilitates the automation of several parts of this design process in order to ease the burden on the architect. Specifically, we first use the 4C reputation framework to generate an XML-based description of a reputation model. This description is used by a tool called the PACE Support Generator to automatically generate and modify relevant trust components and utilities as well as to modify the existing architectural description that can be instantiated to build a trust-enabled decentralized application. In this paper, we also present an in depth evaluation of the PACE Support Generator in the context of the Distributed Trust model.