

PACE: An Architectural Style for Trust Management in Decentralized Applications

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Abstract: Distributed applications that lack a central, trustworthy authority for control and validation are properly termed decentralized. Multiple, independent agencies, or “partners”, cooperate to achieve their separate goals. Issues of trust are paramount for designers of such partners. While the research literature has produced a variety of trust technology building blocks, few have attempted to articulate how these various technologies can regularly be composed to meet trust goals. This paper presents a particular, event-based, architectural style, PACE, that shows where and how to incorporate various types of trust-related technologies within a partner, positions the technologies with respect to the rest of the application, allows variation in the underlying network model, and works in a dynamic setting. Initial experiments with variants of a sample decentralized application developed in the PACE style reveal the virtues of dealing with all aspects of application structure and trust in a comprehensive fashion.