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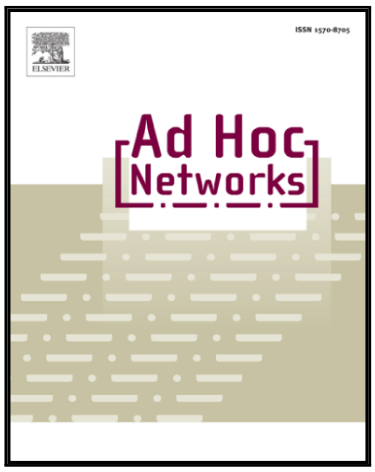

Toward Trust Based Protocols in a Pervasive and Mobile Computing: A Survey

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Toward Trust Based Protocols in a Pervasive and Mobile Computing: A Survey

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Abstract

In the blooming era of Pervasive and Mobile Computing, trust has been accepted as a vital factor for provisioning secure, reliable and seamless communications between pervasive computing elements. However, advancing research in the area of trust-based protocol for distributed Pervasive and Mobile Computing might be challenging due to the ambiguity of the concept of trust as well as the variety of divergent trust models, protocols and algorithms in different contexts. In this research, we augment the trust concept and definition from various field of studies and proposed models in the literature and provide general conceptual phases and methods of trust management toward-trust-based protocols, in the context of Pervasive and Mobile Computing. The paper addresses a broad range of techniques, methods, models, applications and desired futures of trust-based protocols. A number of the currently used trust-based protocols are critically reviewed, and this further leads our discussion to the security attacks and mitigation strategies used with trust-based protocols for pervasive and mobile computing. Finally, the paper discusses open research issues.

Keywords: Trust-based routing protocol, Pervasive and mobile computing, Secure routing protocols, Device-to-device communication, Wireless mobile networks.

1. Introduction

The broad adoption of pervasive computing systems gave rise to the increase in adoption of different technology and applications such as Intelligent Transport Systems for smart cities; the semi-and fully-distributed and autonomous systems; the seemingly imminent Internet of Things and artificial intelligence. These new technologies and applications consist of a group of wireless mobile devices that dynamically exchange data among themselves with no reliance on a central control point. Thus, the self-organization between devices is essential characteristics for the devices to communicate due to their limited transmission range and capacity [1].

A pervasive computing system often synonymously called ubiquitous computing can be viewed as a

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