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Security and privacy for IoT and Fog Computing Paradigm

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Abstract

In the past decade, the revolution in miniaturization (microprocessors, batteries, cameras etc.) and manufacturing of new type of sensors resulted in a new regime of applications based on smart objects called IoT. Majority of such applications or services are to ease human life and/or to setup efficient processes in automated environments. However, this convenience is coming up with new challenges related to data security and human privacy. The objects in IoT are resource constrained devices and cannot implement a fool-proof security framework. These end devices work like eyes and ears to interact with the physical world and collect data for analytics to make expedient decisions. The storage and analysis of the collected data is done remotely using cloud computing. The transfer of data from IoT to the computing clouds can introduce privacy issues and network delays. Some applications need a real-time decision and cannot tolerate the delays and jitters in the network. Here, edge computing or fog computing plays its role to settle down the mentioned issues by providing cloud-like facilities near the end devices. In this paper, we discuss IoT, fog computing, the relationship between IoT and fog computing, their security issues and solutions by different researchers. We summarize attack surface related to each layer of this paradigm which will help to propose new security solutions to escalate its acceptability among end users. We also propose a risk-based trust management model for smart healthcare environment to cope with security and privacy-related issues in this highly un-predictable heterogeneous ecosystem.

Keywords

Author Keywords: IoT; fog computing; security challenges; privacy issues; trust management

KeyWords Plus: THINGS; INTERNET

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