TETES: Trust Based Efficient Task Execution Scheme for Fog Enabled Smart Cities

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Abstract: Quality lifestyle leads to increasing trends in smart cities by offering modern communication and information technologies. Smart cities offer multiple applications with smart management of resources such as smart agriculture, Intelligent transportation systems, waste management and energy management. These applications are based on IoTs that are composed of sensor networks with limited processing and computing capabilities and are connected with different types of networks. Due to limited computational capability, IoT sensor nodes require more time to compute different tasks and are required to offload some tasks to remotely placed cloud servers for task execution. Fog nodes are preferred over the cloud as they are placed in close access to IoT nodes distributed in different networks. Different types of networks make it more vulnerable to malicious attacks. Malicious nodes offload complex and high computing tasks to fog nodes to compromise their performance and create delays in the computing tasks of legitimate nodes. In addition, fog nodes even after removing the malicious nodes are unable to process all the legitimate tasks within a specific time frame. In this work, a Trust-based Efficient Task Execution Scheme (TETES) is proposed for fog node that scrutinizes the offloaded tasks sent by the malicious nodes and efficiently execute most of the trusted tasks within a stipulated time cycle. The simulated results show that TETES execute more offloaded tasks as compared to well-known First Come First Serve (FCFS), Longest Task First (LTF), and Shortest Task First (STF) algorithms.