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A Novel Task Offloading and Resource Allocation Scheme for Mist-Assisted Cloud Computing Environment

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Abstract

Nowadays, the demand for Internet of Things is increasing rapidly throughout the world, thanks to the speed with which wide area networks may be easily reached by numerous users. Due to the increasing growth of the Internet of Things, certain computation will be necessary for significant calculations, such as cloud computing and edge computing, which are now more secure for storing IoT-related data. To manage the massive amount of data collected from various IoT gadgets, this paper proposes a unique approach for offloading jobs to a mist-assisted cloud environment in order to reduce the overall expected schedule and enable very rapid response to diverse IoT events. This method makes use of 'fuzzy logic algorithms,' which take into consideration application attributes, resource deployment, and assortment. As mist-assisted cloud environments are built from the bottom-up, they consist of four layers: IoT devices, mist level, fog level, and cloud level (service provider). The mist controller is a centralized module that is used to manage the scheduling, placement, and control of applications in a mist-assisted cloud environment. The mist controller is composed of four components: an application supervisor, a support manager, a control unit, and a developer. The mist controller is a self-contained equipment that is responsible for scheduling offloading duties in order to fulfill the requirements of mist cloud application users and system requirements. In a series of simulated simulations, the suggested approach is compared to previous approaches that have been found to improve total service time for latency-sensitive applications and make effective use of mist-assisted cloud resources. Additionally, the findings indicate that, depending on the computing resources and communication types available, different decommissioning options inside the mist-assisted cloud environment may result in a varying time period.

Keywords

Fog computing | Cloud computing | Mist computing | Load balancing | Resource utilization

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