Latency-aware Internet of Things Scheduling in Heterogeneous Fog-Cloud Paradigm

Publisher: IEEE Cite This PDF

Abhijeet Mahapatra ; Kaushik Mishra ; Santosh Kumar Majhi ; Rosy Pradhan All Authors

Abstract:
Nowadays, with the advent of many new technologies, the data is alarmingly generated by the widespread of internet devices in this data world. Cloud computing seems a viable option for scheduling dynamic data with disparate specifications. However, the execution time increases due to the computationally-limited resources causing latency overhead. So, Fog computing has evolved as a promising paradigm to complement Cloud computing. Therefore, effectively utilizing the underlying resources for scheduling enormous tasks generated by the latency-sensitive applications is a critical issue. Hence, to cope with this, the current research considers a Multi-Level Feedback Queue (MLFQ) for task classification depending on the priority of each layer to reduce the latency and waiting time. Moreover, the dynamic tasks are scheduled using a heuristic-based approach. A proposed objective function is optimized through the heuristic-based method for the minimization of latency rate, makespan,

Published in: 2022 3rd International Conference for Emerging Technology (INCET)

Date of Conference: 27-29 May 2022

INSPEC Accession Number: 21881755

Date Added to IEEE *Xplore*: 15 July 2022

DOI: 10.1109/INCET54531.2022.9824613

ISBN Information:

Publisher: IEEE

Conference Location: Belgaum, India

Funding Agency:

I. Introduction

Cloud Computing is a viable solution for configuring a virtualized environment for multi-tenant users dealing with hosting their Web applications and scheduling their computation. It leverages the inherent limitations of un-premise computation by shifting it to the cloud paradigm by providing on-demand services. However, it becomes a troublesome for the task generated from latency-sensitive applications, which need computationally-intensive computing nodes for meeting the deadline as well as reducing the associated latency. Apart from this there are many more drawbacks like: high latency, limited mobility, few server nodes, centralized geographical distribution and many more. Fog computing has evolved as a cutting-edge technology to address such issues and to minimize the latency gap between Internet of Things (IoT) devices and the cloud. It complements the cloud paradigm via edge of the network by forming a 3-l

eatures such as reduced latency, geographical distribution of computing nodes, and machine heterogeneity make the Fog computing as one of the prominent technologies over Cloud computing. [1]. Fog computing enables end devices such as set-top-boxes or access points for service hosting. This paradigm facilitates the execution of tasks in the proximity of smart IoT devices and fog computing nodes [2]. The parameters using which the quality or performance of a system is validated is known as Quality of Service (QoS) parameters. There are many different kinds of QoS parameters such as: resource utilization, latency, deadline, service rate, etc. As there is a

More Like This

Sensing Cloud Computing in Internet of Things: A Novel Data Scheduling Optimization Algorithm
IEEE Access
Published: 2020

Cost-Efficient Request
IEEE Internet of Things Journal
Published: 2020

Show More