Chapter 13
Consistent Hashing and Real–Time Task Scheduling in Fog Computing

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ABSTRACT

Distributed caching is one such system used by dynamic high-traffic websites to process the incoming user requests to perform the required tasks in an efficient way. Distributed caching is currently employing hashing algorithm in order to serve its purpose. A significant drawback of hashing in this circumstance is the addition of new servers that would result in a change in the previous hashing method (rehashing), hence, goes into a rigmarole. Thus, we need an effective algorithm to address the problem. This technique has served as a solution for distributed and rehashing problems. Most of upcoming internet of things will have to be latency aware and will not afford the data transmission and computation time in the cloud servers. The real-time processing in proximal distance device would be much needed. Hence, the authors aim to employ a real-time task scheduling algorithm. Computations referring to the user requests that are to be handled by the servers can be efficiently handled by consistent hashing algorithms.

1 INTRODUCTION

With the increasing number of hot spots in cloud computing servers along with the advent of certain concepts such as Internet of Things and big data, distributed systems have gained significant popularity and relevance. Distributed caching is one such system used by dynamic high-traffic websites and web based applications to process the incoming user requests to perform the required tasks in a more efficient way.

A significant drawback of hashing in this circumstance is the addition of new servers would result in a change in the previous hashing method (rehashing), hence, goes into a rigmarole. Thus, consistent hashing would be an effective way to avoid this sudden change in algorithm course. This technique has served as a solution for distributed and rehashing problems. Most of upcoming Internet of Things will have to be latency aware and will not afford the data transmission and computation time in the cloud servers. The real time processing in proximal distance device would be much needed. Hence, we aim to employ a real time task scheduling algorithm.

The main aspects of fog computing to be taken into consideration are storage, computations, network and control. With regard to storage we can employ distributed caching methods as further explained. Computations referring to the user requests that are to be handled by the servers can be efficiently handled by consistent hashing algorithm.

This paper is organized as follows. Section II explains Literature Review. An overview of how it is spread across various classes of users is presented here. Section III introduces Fog Computing and Caching. Section IV presents Edge Computing Systems and Mobile Data Storage Services. In Section V presents Consistent Hashing Model and Section VI presents Conclusion.

2. LITERATURE REVIEW

This is a paper *(Li, G et al. 2019)* that studied resource scheduling problem in fog computing by applying the FCAP algorithm to cluster fog resources. It is initiated by narrowing the range of user requirements for matching resources. They also proposed the RSAF algorithm to accomplish the task of scheduling resources. From the experimental analysis, the objective function value of the FCAP algorithm is seen to have faster convergence speed compared to that of the FCM algorithm. Moreover, the proposed RSAF algorithm will be efficient in matching various user requests with the appropriate resource categories quickly and also enhance user satisfaction. They have left dynamic changes of resources for their future work to produce new scheduling strategy to improve the utilization of resources and ensure user satisfaction. This gave us the motivation to work on the real time task scheduling algorithm.

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