An improved fish swarm algorithm to assign tasks and cut down on latency in cloud computing

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ABSTRACT

Various researches have been conducted to discover the machinery that led to the evolvement of non-symmetric formation of groups by uncountable marine animals. The huge of tasks comes per unit of time brought obstacles to assign each to particular server, while task assignment have needed a fast strategy to make decision. Artificial fish affect the environment through their behavior and the behavior of their peers. Creating a synthetic fish model has two parts: variables and functions which could be used for task assignment. This paper present improved fish swarm algorithm (IFSA) for task assignment to reduce the latency in cloud computing that could achieve one green computing goals. The research trying to reduce the pending job numbers compared with exist research.

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1. INTRODUCTION

Resource allocation is vital in the cloud environment because it plays a key part in scheduling activities that are received on available resources and using them effectively. As a result, resource allocation must involve a smart technique that enables swift scheduling decisions [1]–[4]. There are two criteria to consider during resource scheduling [5]–[10]. First, the amount of time needed to perform all the necessary activities using the available resources, and second, the amount of energy utilized, which is calculated from the volume of processes employed to carry out those tasks [10]–[15].

Gai et al. [16] evaluated their design through a practical scenario simulation and provided reliable results for the evaluations. That paper provided tremendous aid in two different ways. First, the paper served as a first investigation into how to address energy waste problem in a successful networking environment. Next, the proposed design offers a future study with guidance and hypothetical support.

Green mobile crowd sensing (G-MCS) was proposed by Marjanovi et al. [17] and uses a quality-driven sensor supervision function to continuously select the k-best sensors for a certain sensing task. In order to help mobile devices work with the cloud in conjunction for energy-aware mobile crowd sensing (MCS), the mobile crowd sensing “MCS solution” uses a cloud-related architecture to achieve this purpose. In particular, it eliminates outdated sensor activity while satisfying sensing coverage requirements and sensing quality, which reduces the total energy usage of an MCS application. Here, they proposed a green mobile crowd...
sensing G-MCS model and evaluated its energy efficiency for a range of application requirements and sensor placement settings.

Guo et al. [18] focused on high-performance multi-label stratification approaches and their deployment to medical recommendations of the 5G domain communication. In that study, they recommended the two label selection approaches clustering-relate sampling (CBS) and frequency-based sampling for multi-label stratification (FBS). For projecting doctor labels to doctor recommendations, they applied their innovative 5G multi-label stratification approaches.

Mao et al. [19] approximated green mobile edge computing (MEC) system using devices to come up with an efficient mechanism for compute offloading. The implementation cost, task failure, and latency were used as the performance metrics. The lyapunov optimization-related dynamic computation offloading (LODCO) algorithm, which determines jointly the central processing unit (CPU)-cycle frequencies to mobile implementation, the offloading determination, and the pass-on power to computation offloading, has been proposed as a low-complexity online algorithm. The algorithm’s decision-making relies just on the system’s current state; no distribution info regarding the computation task appeal, energy harvesting, or wireless media operations is required. Every time the method is run, it must fix a deterministic problem for which the best solution is found either in clogged form or via bisection search.

Mobile-related stations and their routing protocol have been proposed by Sarddar et al. [20]. An approach was given to clarify the applicability of the recommended model. This task’s suggested design aims to provide weight-based, optimal routing. The authors provided an approach to reduce network congestion and ensure a more refined data flow between mobile devices and cloud nodes using this unique procedure. Mitigation of mobile network congestion problems and improvement of data transmission rate are important for achieving green cloud computing. Table 1 provided comparisons of the proposed approach with recent literature. Few problems of resource allocation that can be resolved using load balancing methods were also listed.

In order for this research to aid in identifying future research areas and benefit from them, we concentrated on highlighting the significance of resource allocation and its connection to load balancing. This research demonstrated the significance of all resource allocation as well as the scope of work in load balancing. Areas with a large concentration of fish are typically those with more food. Each artificial fish’s subsequent actions are influenced by its immediate surroundings. Artificial fish has an impact on the environment through their own and their peers’ actions. Variables and functions are the two components of building a synthetic fish model. The following contributions are made: 1) a cloud computing analysis of job scheduling and its components; 2) concentrate on load balancing difficulties using resource allocation techniques; and 3) consider the benefits and drawbacks of resource allocation.

This study presents an enhanced fish swarm algorithm (IFSA) for task assignment that can help cloud computing fulfill one of its green computing objectives by reducing latency. The following contributions were made to the paper: 1) a new IFSA was proposed; 2) the number of cluster nodes was increased to increase production while the core node was being expanded; and 3) the makespan of an IFSA was improved when compared to other techniques. The research is divided into sections; the first portion is a preamble that discusses the problem, reviews studies that have addressed it, and identifies its advantages and disadvantages before defining the key objectives. The proposed algorithm was discussed in the second section, which included the code and a diagram. The third portion discussed the results and compared them to existing frameworks, and the final part was a conclusion.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Method</th>
<th>Layer</th>
<th>Objective</th>
<th>Weakness</th>
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<tbody>
<tr>
<td>Gai et al. [16]</td>
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<td>Simulation scenario</td>
<td>Two</td>
<td>Energy reduction</td>
<td>The initial exploration in rectifying energy</td>
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<tr>
<td>Guo et al. [18]</td>
<td>2016</td>
<td>CBS and FBS</td>
<td>5G</td>
<td>Strengthen connection</td>
<td>Predicting doctor labels to doctor suggestions</td>
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<tr>
<td>Mao et al. [19]</td>
<td>2016</td>
<td>Green MEC</td>
<td>Offloading strategy</td>
<td>Reduce latency and task failure</td>
<td>The execution of the algorithm needs to rectify a deterministic issue in every time</td>
</tr>
<tr>
<td>Sarddar et al. [20]</td>
<td>2015</td>
<td>Weight-based optimized routing</td>
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<td>Congestion situations are considered</td>
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<td>Proposed</td>
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<td>IFSA</td>
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<td>No offloading site considered</td>
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</table>

2. METHOD

This paper present IFSA for task assignment to reduce the latency in cloud computing that could achieve one green computing goals, the Table 1 show the gab through research and our work differentiation among them and to investigate reduction of the latency the weakness is no offloading site will be considered,
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3. RESULTS AND DISCUSSION

We considered the number of cases being entered periodically, we chose five tasks as productive tasks and they come every four hours, to handle these tasks. Figure 3 shows the number of jobs waiting, in this figure, 5m1 meaning using 5m1 as a core node, and by gathering with 4m1, which is 5m1 + 4m1. If we use 5m1, there will be an increase in production, which is overloaded of the core node, so we need to add a number of nodes to distribute the load. On it, which helps in increasing production and during the expansion of the core node, by extending the cluster nodes to be 9 node that could be sufficient to accommodate the results of the jobs.

3.1. Execution time

The task implementation time refers to the interval from the commencement of the task to its completion. Before deciding whether to offload a task or not, especially for the compute-intensive tasks, it is crucial to evaluate the task’s execution time. The recommended task’s implementation time, as measured by nodes and iterations, is shown in Figure 4.

4. CONCLUSION

In this study, the job scheduling and related features of cloud computing were examined. The study emphasized on the difficulties and advantages of load balancing using resource allocation techniques. We considered the number of cases being entered periodically, we chose five tasks as productive tasks and they come every four hours, to handle these tasks the work shows the number of jobs waiting,
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REFERENCES

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