



Privacy-Preserving Swarm Optimization With Authentication Scheme For Task Offloading In Edge And Cloud Computing

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ABSTRACT

Edge-dispersed enlisting is a feasible strategy for overseeing address the high dormancy issue in flexible coursed handling for association provisioning, by setting several figuring assets near end gadgets. To also cultivate the client fulfillment and the asset effectiveness, this paper rotates around the undertaking offloading and association saving issue for offering sorts of help by edge-conveyed handling. This paper figures out the issue as an obliged discrete streamlining issue, and proposes a crossover heuristic strategy thinking about Molecule Huge number Movement (PSO) to deal with the issue in polynomial time. The proposed system, LMPSO, exploit PSO to manage the assistance saving issue. To keep away from PSO getting into adjoining streamlining, LMPSO adds lévyflight progression for iota restoring to manage the combination of molecule. Given the help saving arrangement, LMPSO incorporates a heuristic method with three phases for task offloading, where the chief stage tries to make full utilization of cloud assets, the following stage incorporates edge assets for fulfilling necessities of latency sensitive errands, and the continue to go stage manages the general execution of undertaking executions by re-offloaded several assignments from the cloud to edges. Reenacted analyze results show that LMPSO has up to 156% better client fulfillment, up to 57.9% higher asset suitability, and up to 155% more fundamental dealing with capacity, when in doubt, contemplated with other seven heuristic and meta-heuristic procedures.

INTRODUCTION

Nowadays, compact and Web of Thing (IoT) contraptions ought to be noticeable everywhere, and their reputation is on the rising with the extending of client necessities and the headway of information and correspondence advancement. As shown in Cisco Yearly Web Report, overall flexible endorsers will address 71% of people, and IoT devices will address about piece of overall organized contraptions, by 2023. The flexible and IoT clients' necessities can't be guaranteed only by circulated figuring for organization movement, due to the ample grouping and measure of Internet services and the high association inactivity of the cloud. Subsequently, progressively more expert centers use edge figuring to chip away at the.

Organization quality, by putting a handling resource close to client devices.

In view of the bound space of edge handling centers (edges for short), there are limited proportion of figuring and accumulating resources in edges. Hence, edge figuring can't offer an extensive variety of help at a time. Subsequently, edge-circulated processing is a capable strategy for conveying both idleness fragile and resource hungry organizations, by joining the advantages of both edge figuring and dispersed registering. In edge circulated figuring, a couple of organizations are conveyed (saved) on an edge for inaction sensitive requesting, and the cloud can convey all organizations due to its "perpetual" handling and storing resources. There are two decisions ought to be

made for organization provisioning by edge-conveyed registering with high capability and execution, organization putting away and task offloading. The help holding is to close which organizations are sent on edges. Task offloading picks where every requesting task is served.

These two unique issues are interrelated. An endeavor can be offloaded to an edge when its referenced organization is saved on the edge. Overall, it is more intelligent to store organizations with extra sales and offload more requests into edges, as edges give a ton of lower network inaction than the cloud. Regardless, in light of the limited resources on edges, offloading more endeavors to edges can achieve a growing of the figuring lethargy. Thusly, the help saving and errand offloading frameworks should be commonly arranged circumspectly for changing the figuring dormancy on edges and the association inactivity on the cloud to additionally foster the assistance quality. Unfortunately, the joint assistance putting away and task offloading issue is NP hard. There generally three kinds of methods to determine the issue, which are independently heuristics, meta-heuristics, and man-made intelligence (ML). Overall, heuristics rush to give courses of action, but the plan execution is limited on account of their close by chase considerations. Metaheuristics can achieve further developed courses of action than heuristics, benefitting from their overall request limits, but they generally consume truly figuring time. ML-based procedures advance a couple of models from the irrefutable states of undertaking executions, and go with saving and offloading decisions for following tasks considering learned plans. ML-based methodologies could achieve favored execution over other two kinds of strategies, but they are unnecessarily excessive for the model getting the hang of (planning).

Subsequently, a couple examines used meta-heuristics, e.g., Genetic Computation (GA), Particle Huge number Improvement (PSO), Whale Smoothing out Estimation (WOA), and Cuckoo Search Computation (CSA), for handling the assistance putting away and task offloading issue. This is chiefly considering the way that meta-heuristics for the most part achieve a favored show over heuristics in light of their overall chase limits. A couple of works exploited the combination of two meta-heuristics, e.g., PSO + GA, which can achieve a best display over each one. While, these strategies didn't consider to facilitate heuristic area search procedure into a meta-heuristic for the joint assistance putting away and task offloading issue, notwithstanding the way that it have been used in various issues in light of the extraordinary

presentation by uniting the two advantages of heuristics and metaheuristics.

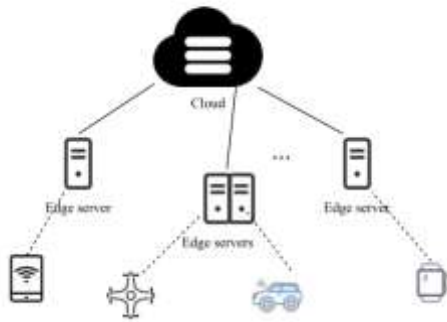
Thusly, this paper exploits a crossbreed heuristic system by merging a representative meta-heuristic computation, Particle Large number Improvement (PSO), and a heuristic estimation for joint assistance holding and undertaking offloading. Specifically, the proposed method, named LMPPO, uses PSO to achieve an assistance saving, with the wellbeing evaluated by the client satisfaction and resource efficiency. To achieve a task offloading game plan given an assistance saving course of action, LMPPO uses a heuristic estimation to additionally foster the client satisfaction and resource viability. To vanquish the issue that PSO is easily gotten into adjacent smoothing out, LMPPO consolidates lévy flight plot into atom advancements to deal with the range of particles. The responsibilities can be summarized as follows.

1) The joint assistance putting away and task offloading issue is shown into a constrained discrete upgrade issue, to restrict the client satisfaction and resource viability, for edge-circulated processing. In this paper, the client satisfaction is assessed by the amount of tasks with the satisfaction of their essentials. The resource viability is surveyed by the overall resource use.

2) To handle the joint assistance putting away and task offloading issue in polynomial time, a combination heuristic estimation is arranged, which is named as LMPPO. LMPPO exploits PSO computation, and uses lévy trip in atom moving to chip away at the show of PSO. In LMPPO, each particle position tends to an assistance putting away game plan, and the value in a perspective is the edge servers that the relating organization is saved. Given an assistance putting away game plan, LMPPO includes a heuristic strategy with three stages for task offloading. The principal stage is pre-offloading anything that number tasks as could be anticipated in light of the current situation to the cloud, for exploiting the luxuriousness of cloud resources. The ensuing stage offloads remain tasks to edges for executing latency sensitive tasks. At last stage, the heuristic procedure re-offloads tasks from the cloud to edges to deal with the overall execution of undertaking execution.

3) Expansive reenacted tests are coordinated for surveying the introduction of LMPPO, where limits are set suggesting existing works and reality. The preliminary outcomes show that LMPPO has 8.34%-156%, 1.00%-57.9%, and 7.91%-155% better execution in client satisfaction, resource capability, and taking care of viability, independently,

differentiated and other seven heuristic and meta-heuristic strategies, in as a rule.



MOTIVATION

As the expanding of client requests, the distributed computing or the edge registering alone can't acknowledge all of undertakings mentioned by different versatile and IoT gadgets. In this manner, a few distributed works zeroed in on the edge-distributed computing to offer types of assistance with more proficiency by task offloading. Liu et al. [23] gave a technique the possibility of earliest completion time first, which diminishes how much the information move by task excess executions, to enhance the completion season of a work process. Sang et al. [24] proposed a heuristic undertaking offloading technique to streamline the client fulfillment with cutoff time imperatives. The heuristic strategies normally take a brief period however have restricted execution. Consequently, a few works utilized metaheuristic-based offloading to accomplish a superior exhibition with tedious to the detriment of the worldwide inquiry capacity. Involved conventional calculation for streamlining the general execution time with cutoff time requirements. Introduced a PSO-based errands offloading technique for gadget edge-cloud helpful registering to further develop SLA fulfillment. A few different works took advantage of AI (ML) for task offloading. Planned a profound support learning based technique to enhance the help inertness for edge figuring enabled Web of vehicles. Planned a brain model to learn both offloading and time division choices in each schedule opening for limiting the deferral with cutoff time and energy limitations. ML-based techniques can give a proficient offloading arrangement, yet generally cost a great deal of time for information preparing.

OUR CONTRIBUTION

The following is a summary of the article's significant contributions:

- 1) The main and important methods for data security through safe sharing in a cloud context are reviewed in this paper.
- 2) We offer the following information regarding each strategy.
 - (a) How it functions in terms of data protection, and
 - (b) the superior, ground-breaking options available.
 In order to make it simple for readers to understand the essence of the approach as well as its applications, we also include potential and valuable information about each presented solution in a tabular manner, such as its working, implementation environment, success, range of the provided model, etc.
- 3) A thorough and comparative study of the methodologies covered is conducted and presented in an accessible manner. Additionally, research is done to determine which technique will best meet the needs.

EXISTING SYSTEM:

Edge-distributed computing is a proficient way to deal with address the high idleness issue in portable distributed computing for administration provisioning, by setting a few figuring assets near end gadgets. To further develop the client fulfillment and the asset productivity, this paper centers around the undertaking offloading and administration storing issue for offering types of assistance by edge-distributed computing. These days, portable and Web of Thing (IoT) gadgets should be visible all over, and their notoriety is on the ascent with the expanding of client necessities and the improvement of data and correspondence innovation. As displayed in Cisco Yearly Web Report [4], worldwide portable endorsers will represent 71% of populace, and IoT gadgets will represent about portion of worldwide arranged gadgets, by 2023. The portable and IoT clients' necessities can't be ensured simply by distributed computing for administration conveyance, because of the plentiful assortment and amount of Internet providers and the high organization idleness of the cloud.

Existing System Disadvantages:

- administration storing issue for offering types of assistance by edge-distributed computing
- centers around the undertaking offloading
- Expanding of client prerequisites and the improvement of data and correspondence innovation.

LITERATURE SURVEY

Password-guessing attack-aware authentication scheme based on Chinese remainder theorem for 5G-enabled vehicular networks.

The new fifth-generation (5G) cellular networks dramatically improve the speed of message transmissions. Most existing authentication schemes that secure 5G communication rely heavily on the vehicle's tamper-proof device (TPD) and roadside units (RSUs) to store the system's master key. However, it only takes a single compromised TPD to render the whole system insecure. We propose a password-guessing attack-aware authentication scheme based on the Chinese Remainder Theorem (CRT) to secure inter-vehicle communication on 5G-enabled vehicular networks to address this issue. The trusted authorities (TAs) in the proposed scheme generate and broadcast new group keys to the vehicles assisted by CRT. Moreover, since the system's master key does not need to be preloaded, the proposed scheme only requires realistic TPDs. The proposed scheme overcomes password-guessing attacks and guarantees top-level security for entire 5G-enabled vehicular networks. The security analysis indicates that the proposed scheme is secure against adaptive chosen-message attacks under the random oracle model and meets the security requirements of a 5G-enabled vehicular network. Since cryptographic operations based on elliptic curve cryptography are employed, the performance evaluation shows that the proposed scheme outperforms the eight existing schemes in terms of computation and communication costs.

An incentive-aware block chain-based solution for internet of fake media thing.

The rapid evolutions in wireless communications as well as the urgent demand for reducing traffic jams and road fatality rates lead to appear Vehicular Ad-Hoc Networks (VANETs). There is a necessity to ensure that any connection within VANETs should be secure against cyber-attacks. This is due to the fact that data transmission through any open-access environment may lead to different network attacks. Therefore, the identity-based privacy-preserving authentication scheme (ID-PPA) was proposed in this paper in order to resolve different issues that are related to the security and privacy in VANETs. Recently, there are a lot of ID-based schemes of security in VANETs have been introduced. However, these schemes could suffer from many problems. Indeed, ID-PPA scheme overcomes these problems that are found in ID-based schemes.

However, ID-PPA scheme avoids key escrow problems and impersonation attacks that are found in other ID-based schemes. Moreover, it provides an efficient process to trace and revoke any malicious vehicle in the network. In the ID-PPA scheme, the first and second phases describe the initialization of system parameters and vehicle registration. The third phase is responsible for creating mutual authentication between vehicle and roadside unit (RSU). It is also responsible for generating a set of signatures for each vehicle by the RSU. The beacon generation and the verification processes are explained in the last phase. The security analysis indicates that the ID-PPA scheme can satisfy all the security and privacy requirements, and can avoid the well-known attacks. Finally, a comparison between our scheme and other ID-based schemes shows that the cost of computation without using batch verification, which may cause problems in some cases, is significantly reduced using the ID-PPA scheme.

Towards identity-based conditional privacy-preserving authentication scheme for vehicular ad hoc networks.

Vehicular ad hoc networks (VANETs) have become increasingly common in the past decades and provides essential and efficient communication for vehicles within intelligent transportation systems. Securing the VANETs wireless communication channel is one of the principal challenges in VANETs since existing security schemes are still vulnerable to security and privacy issues and have substantial computational and communicational overheads. To overcome these issues, this paper focuses on enhancing an authentication scheme based on conditional privacy-preserving and improving its performance efficiency. This paper reviews the security vulnerabilities of the existing schemes. It also proposes enhancements to the identity-based conditional privacy-preserving authentication scheme to secure and improve the efficiency of VANETs communications. The proposed scheme not only satisfies the security and privacy requirements but also has been proven secure under the random oracle model. Finally, the performance evaluation shows that the proposed scheme is more efficient computationally and communicational than the existing schemes in signing and verifying VANETs messages.

Orchestration in fog computing: A comprehensive survey.

Fog computing is a paradigm that brings computational resources and services to the network edge in the vicinity of user devices, lowering latency

and connecting with cloud computing resources. Unlike cloud computing, fog resources are based on constrained and heterogeneous nodes whose connectivity can be unstable. In this complex scenario, there is a need to define and implement orchestration processes to ensure that applications and services can be provided, considering the settled agreements. Although some publications have dealt with orchestration in fog computing, there are still some diverse definitions and functional intersection with other areas, such as resource management and monitoring. This article presents a systematic review of the literature with focus on orchestration in fog computing. A generic architecture of fog orchestration is presented, created from the consolidation of the analyzed proposals, bringing to light the essential functionalities addressed in the literature. This work also highlights the main challenges and open research questions.

Resource provisioning in edge/fog computing: A comprehensive and systematic review.

Close computing paradigms such as fog and edge have become promising technologies for mobile applications running on pervasive mobile equipment utilized by a wide range of users to remove such types of equipment's inherent limitations. In such environments, competition is a severe challenge to gain computation and communication resources' capabilities. Therefore, resource allocation in the mentioned environments are becoming a requirement, which is an essential challenging issue addressed by different approaches, including resource provisioning. However, to the best of the authors' knowledge, any systematic, comprehensive, and detailed survey related to resource provisioning has not been applied in computation environments despite its importance. This paper provides a review of the resource provisioning approaches in computation paradigms in the form of a standard classification to identify the existing approaches on this critical topic and offer open issues. The proposed classification can be organized into five main fields: framework-based, heuristic/meta-heuristic-based, model-based, machine learning-based, and game theoretic-based mechanisms. Next, these classes are compared based on some essential features such as performance metrics, case studies, utilized techniques, and evaluation tools. Finally, open issues and uncovered or insufficiently covered future research challenges, including resource performance, resource location, uncertainties, resource elasticity, and resource migration are discussed, and the survey is concluded.

Privacy-Preserved Task Offloading in Mobile Blockchain with Deep Reinforcement Learning.

In this paper, a massive multiple-input multiple-output (MIMO) relay assisted multi-tier computing (MC) system is employed to enhance the task computation. We investigate the joint design of the task scheduling, service caching and power allocation to minimize the total task scheduling delay. To this end, we formulate a robust non-convex optimization problem taking into account the impact of imperfect channel state information (CSI). In particular, multiple task nodes (TNs) offload their computational tasks either to computing and caching nodes (CCN) constituted by nearby massive MIMO-aided relay nodes (MRN) or alternatively to the cloud constituted by nearby fog access nodes (FAN). To address the non-convexity of the optimization problem, an efficient alternating optimization algorithm is developed. First, we solve the non-convex power allocation optimization problem by transforming it into a linear optimization problem for a given task offloading and service caching result. Then, we use the classic Lagrange partial relaxation for relaxing the binary task offloading as well as caching constraints and formulate the dual problem to obtain the task allocation and software caching results. Given both the power allocation, as well as the task offloading and caching result, we propose an iterative optimization algorithm for finding the jointly optimized results. The simulation results demonstrate that the proposed scheme outperforms the benchmark schemes, where the power allocation may be controlled by the asymptotic form of the effective signal-to-interference-plus-noise ratio (SINR).

PROPOSED SYSTEM

This paper sorts out the issue as an obliged discrete upgrade issue, and proposes a mutt heuristic procedure considering Particle Large number Improvement (PSO) to handle the issue in polynomial time. The proposed procedure, LMP SO, exploit PSO to handle the assistance putting away issue. To avoid PSO getting into neighborhood upgrade, LMP SO adds lévy flight improvement for atom invigorating to deal with the assortment of particle. Given the assistance putting away game plan, LMP SO includes a heuristic method with three stages for task offloading, where the principal stage endeavors to exploit cloud resources, the ensuing stage includes edge resources for satisfying necessities of inactivity fragile tasks, and the keep going stage deals with the overall execution of undertaking executions by re-offloaded a tasks from

the cloud to edges. Imitated attempt results show that LMP SO has upto 156% better client satisfaction, up to 57.9% higher resource capability, and up to 155% more conspicuous dealing with efficiency, in by and large, differentiated and other seven heuristic and meta-heuristic methodologies.

ADVANTAGE

- To keep away from PSO catching into neighborhood streamlining, LMP SO adds lévy flight development for molecule refreshing to work on the variety of molecule.
- Last stage works on the general execution.
- higher asset effectiveness

MODULES NAME

- User Interface Design
- Visitor
- Admin
- Sales
- Purchases

➤ User Interface Design

In this module we design the windows for the project. These windows are used for secure login for all users. To connect with server user must give their username and password then only they can able to connect the server. If the user already exists directly can login into the server else user must register their details such as username, password and Email id, into the server. Server will create the account for the entire user to maintain upload and download rate. Name will be set as user id. Logging in is usually used to enter a specific page.

➤ Visitor

This is the first module of this project and he will be the administrator and has control over all the things. In this module User can login. After login user can view the products pictures. a user can be view products lists and user can be check the product quality percentage and user can a see the reviews products and give the reviews.

➤ Admin

This is the second module of this project. In this project admin will Register and admin he should login. Admin will upload the products. Admin can add the products. Admin can have seen the product list and admin can check the product quality percentage.

➤ Sales

This is the third module in this project. In this project user will login in this page and admin also login in this page admin and user both are log in in this page. In this page it will show how many products will sales and there information. This page will show product name, Price of unit, quantity and final one is date.

➤ Purchases

This is the fourth module in this project. In this page admin will log in and admin will check products purchases and the products status. Admin and users are login in this page. This page will show product name, quantity, purchases and date of product purchase.

PROPOSED ALGORITHM LMP SO

Fixed-length block obvious monotony can't be changed and to settle the joint assistance saving and errand offloading issue in polynomial time, a hybrid heuristic computation is arranged, which is named as LMP SO. LMP SO exploits PSO computation, and uses lévy trip in particle moving to chip away at the introduction of PSO. In LMP SO, each particle position tends to an assistance saving game plan, and the value in a viewpoint is the edge servers that the relating organization is put away. Given an assistance saving game plan, LMP SO includes a heuristic strategy with three stages for task offloading. The chief stage is pre-offloading anyway numerous tasks as would be judicious to the cloud, for making the most of the extravagance of cloud resources. The resulting stage offloads remain tasks to edges for executing idleness sensitive endeavors. At long last stage, the heuristic method re-offloads tasks from the cloud to edges to deal with the overall execution of undertaking execution.

EXISTING SYSTEM PSO algorithm

A half and half heuristic strategy by consolidating a delegate meta-heuristic calculation, Molecule Multitude Enhancement (PSO), and a heuristic calculation for joint help reserving and task offloading. In particular, the proposed technique, named LMP SO, utilizes PSO to accomplish a help storing, with the wellness assessed by the client fulfillment and asset proficiency. To accomplish an undertaking offloading arrangement given a help storing arrangement, LMP SO utilizes a heuristic calculation to further develop the client fulfillment and asset productivity. To conquer the issue that PSO is effectively caught into nearby streamlining, LMP SO

coordinates lévy flight conspire into molecule developments to work on the variety of particles.

SCREENSHOTS

Index Page



CSP Home Page



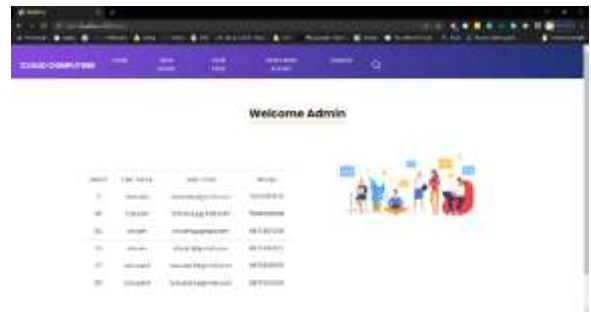
Attacker Page



User Home page



File Attacker Page



CONCLUSION

This research studies on the service caching and the task offloading problems to improve the user satisfaction and the resource efficiency for edge-cloud computing. Their joint problem is formulated as a discrete optimization problem, and a hybrid of PSO with the lévy flight movement and a three-stage heuristic method for solving the problem. Simulated experiment results verify the performance advantages of the proposed hybrid heuristic method. This paper focuses on the static caching of services on edges, which means the caching replacement doesn't concerned during the service provisioning. When there is no storage space for caching more services on an ES, it is an option to replace a service by another new service to improve the overall performance. It is a challenging work for designing efficient caching replacement solution. If the caching replacement solution is improper, it will waste a lot of edge-cloud resources for replacing a service, leading to a much low resource efficiency. Therefore, one of the future works is to design caching replacement method with high efficiency and effectiveness.

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