Applied Mathematics & Information Sciences
An International Journal

http://dx.doi.org/10.18576/amis/110625

Efficient File Sharing Mechanism In P2P Using Energy Efficient Clustering Mechanism

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Received: 10 Sep. 2017, Revised: 25 Oct. 2017, Accepted: 28 Oct. 2017
Published online: 1 Nov. 2017

Abstract: Effective and secured file sharing is the essential factor in real time networks. Common distributed network environment faces numerous problems in existing file sharing mechanism. In this research paper we have proposed a novel approach using Trust based Energy Efficient Clustering Mechanism by using firefly algorithm to improve the throughput. The proposed architecture has been designed with four phases for effective file sharing in P2P networks. In the first stage an Energy Efficient Clustering Mechanism with Firefly calculation has been introduced. A vitality proficient Clustering calculation with ideal parameters is intended for decreasing the vitality utilization and drawing out the framework lifetime. The second part of system focuses on Routing and accurate reputation framework. The third phase implements the Security Trust that can distinguish and shield fair associates from attack. In the last stage File Replications are identified and replicas are removed. This four stage framework shows drastic improvements in low delay, high speed, high efficiency Throughput when compared to existing framework. The results indicate that the time consumed by proposed method is very less when compared with existing algorithms.

Keywords: Effective file sharing, File Replication, Clustering, Firefly calculation

1 Introduction

The Network hubs sent in wireless sensor systems are to a great degree control compelled, and consequently boosting the lifetime of the whole systems is predominantly considered as a factor. A vitality effective Clustering calculation with ideal parameters is intended for diminishing the vitality utilization and drawing out the framework lifetime. Here we present an Energy Efficient Clustering Mechanism (EECM) with Firefly calculation and furthermore exhibit a Cluster key Management for secure transmission in MANET. A Firefly Algorithm (FA) is a current nature motivated improvement calculation that reenacts the blaze example and attributes of fireflies.

Clustering is a prominent information examination procedure to recognize homogeneous gatherings of items in view of the estimations of their characteristics. Firefly calculation is a swarm based calculation utilized for explaining advancement of wireless sensor parameters[1]. This Research is concentrated on utilizing firefly calculation to group information. The firefly calculation can be utilized to discover the Centroids of the client indicated number of clusters. We utilize the firefly calculation to discover beginning ideal group Centroids and after that upgraded centroid to refined them and enhance clustering precision. The convention likewise bolsters effective key disavowal for bargained hubs and limits the effect of a hub trade off on the security of other correspondence joins[2]. A security investigation of our plan demonstrates that our convention is powerful in guarding against different attacks.

For some P2P frameworks, actualizing right impetuses and approaches to advance effective and reasonable asset sharing is the way to enhance the general framework execution. In this paper, we propose a focuses based motivating force system named Global Contribution (GC) approach that productively and normally keeps up reasonableness in a P2P organize[3]. In this approach, a proposed GC calculation first computes a worldwide score for each companion that precisely mirrors its data transmission commitment to the whole system. At that point, these scores are utilized as a part of a proposed information exchange approach to figure out if

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one companion can download information from different associates [4–6].

In this way, the GC approach accomplishes: 1) proficiently anticipating free-riding, 2) normally adjusting the transfer and download sums in each companion, and 3) decreasing dismissals in exchanges between agreeable associates. Besides, the GC calculation requires just private exchange history as info and can be completely decentralized. Additionally, its time complexities are roughly O (N2) a unified framework and O (N) per peer in a decentralized framework.

2 RELATED WORKS

Li et al. played out a few upgrades on the McDaniel and Heydari's strategy to enhance its precision. Their upgrades was utilizing multi-centroids for some record sorts, truncating the example documents from their start as opposed to utilizing all the record substance, utilizing K-Means calculation under Manhattan separation to deliver the document prints and sending Mahalanob is remove for correlation between the obscure specimens and document prints. Dunham et al. conveyed neural systems to order record sorts of stream figures inside and out, i.e. the documents encoded with a similar key. They utilized byte recurrence, byte recurrence of autocorrelation, and 32 bytes of header as the chose highlights of their test tests.

Zhang et al. utilized the BFD in conjunction with a basic Manhattan remove correlation with recognize whether the inspected record is executable or not. Another substance based document sort location technique is presented that conveys the Principal Component Analysis (PCA) and unsupervised neural systems for the programmed include extraction.

McDaniel and Heydari acquainted three calculations with investigate document and recognize record sorts. The byte-recurrence examination calculation (BFA) figures the byte-recurrence dispersion of various records and produces "unique finger impression" of each document sort by averaging the byte-recurrence appropriation of their particular documents. To acquire another describing factor, they additionally compute the relationship quality as by taking the contrast between a similar byte in various records. The byte-recurrence cross relationship calculation finds the connections between all byte sets. It figures the normal frequencies of all byte sets and the connection quality in a comparable way to the BFA calculation. The document header/trailer calculation utilizes the byte-examples of the record headers and trailers that show up in a settled area toward the start and end of a record, separately. It builds the unique mark by averaging the relationship quality of each document. In these calculations, they contrast the document and all the produced fingerprints with a specific end goal to distinguish its record sort.

Repantis and Kalogeraki propose a document sharing instrument. Hubs utilize the Bloom channel to collect substance summaries of their information and after that disperse them adaptively to the most proper hubs. Moreover, the techniques can't ensure the fruitful looking of document, particularly when the courses lapse because of hub portability. Beth et al. additionally proposed confide in show for dispersed systems. They got trust suggestions from coordinate trust and gave them formal portrayals, and also principles to infer trust connections and calculations to figure put stock in values. Josang et al. portray a trust demonstrate where positive and negative input about a particular part is aggregated. The model depends on the Bayesian system show, utilizing the beta likelihood thickness capacity to compute a part's normal future conduct.

N. Santos, K. Gummadi, and R. Rodrigues trusted distributed computing stage (TCCP) which empowers IaaS suppliers to offer a shut box execution condition that ensures private execution of visitor virtual machines (VMs) is proposed. This framework enables a client to confirm whether its calculation will run safely, before asking for the administration to dispatch a VM. TCCP expect that there is a trusted facilitator facilitated in a reliable outer element. The TCCP ensures the privacy and the respectability of a client's VM, and enables a client to decide ahead of time regardless of whether the IaaS upholds these properties.

T. Dillon, Chen Wu, and E. Chang assess various trust models for appropriated cloud frameworks and P2P systems. It additionally proposes a reliable cloud engineering (counting trust assignment and notoriety frameworks for cloud asset locales and datacenters) with ensured assets including datasets for on-request benefits.

3 PROPOSED MECHANISM

In this paper, we focus on abnormal state strategies that give right motivations to advance asset partaking in a reasonable and effective way in a P2P arrange. One of the key variables to advance asset sharing is decency. A companion in a system feels reasonable if given the measure of information that it has added to different associates, it ought to have the capacity to download an equivalent sum. Anticipating free-riding is additionally basic to keeping up reasonableness in this sense. Another key variable to advance asset sharing is proficiency. Less dismissal in exchanges between helpful associates will convey higher proficiency to a whole system. So as to accomplish them, we have to actualize a legitimate approach which additionally considers companions' "self-intriguing" conduct. To keep decency, the prominent one good turn deserves another approach has been presented. In blow for blow, the exchanges between two associates are made by an approach that "In the event that you give me, I will give you. In the event that you don't give me, I won't give you." practically speaking, a

companion is permitted to download some underlying measure of information from another associate that it has never executed with. This is important to bootstrap the sharing procedure. Something else, no companion would have the capacity to impart information to anybody since at first an associate has no exchange history with any companion. In spite of the fact that this approach keeps reasonableness to some degree, free riding proceeds the length of there are associates with which free riders have never executed. This is a direct result of the underlying sum a free-rider can download.

The bigger a P2P system is, the more momentous this issue gets to be since a free-rider can locate another associate that it never executes with, to download its craved information. Another case of issues in regards to reasonableness at present not tended to by blow for blow is asymmetry of exchanges. In B downloaded 50 GB from A, C downloaded 50 GB from B, and A downloaded 30 GB from C. At that point, A needs to download another 20 GB from C. With blow for blow, A may be dismisses by C after it downloads some underlying sum. This is on the grounds that A has never transferred to C. Be that as it may, this plainly is not reasonable as A has contributed much information to the framework. This issue is to be sure resolvable utilizing shared history and max stream. Utilizing the mutual history, each companion keeps all exchange histories that happen in a system. By computing the maximum spill out of a downloading associate to a transferring peer utilizing the common history, the transferring companion can gauge the commitment of the downloading peer. In view of the commitment level, the transferring companion can then choose whether it ought to impart its information to the downloading peer. Be that as it may, the trouble with this approach is versatility. The count of max stream takes O (N3). The mutual history is likewise not possible both from the perspectives of capacity and data transfer capacity expected to store and disperse all exchanges to each companion.

4 Research Framework

The calculation is straightforward yet effective, and it productively keeps a system in a reasonable condition. The trouble with this approach is adaptability. The count of max stream takes O(N3). The common history is additionally not practical both from the perspectives of capacity and transfer speed expected to store and disperse all exchanges to each associate[7−9]. In any case, regardless it requires much work to enhance security and to explore other exchange methods. Besides, we have not yet gotten a handle on all issues which will emerge in down to earth use. Hence, tests in genuine P2P systems will be basic. Proficient and dependable document questioning is vital to the general execution of distributed record sharing frameworks[10]. In this paper we proposed half breed system called ETC-P2P for productivity and trust based distributed systems in MANET. (i) First we approach an Energy Efficient Clustering Mechanism (EECM) with Firefly calculation. A vitality productive clustering calculation with ideal parameters is intended for lessening the vitality utilization and drawing out the framework lifetime.

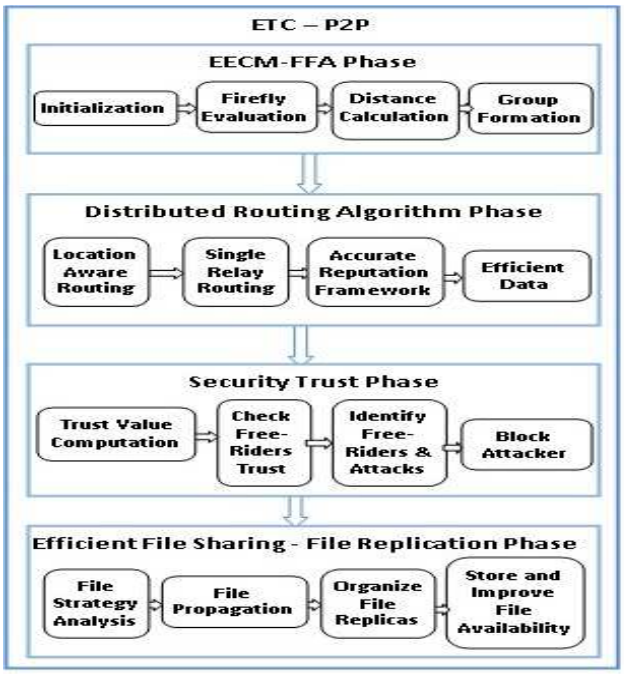


Fig. 1: Architecture Framework for ETC-P2P

. (ii) Then we concentrate on the second part of system virtualization and consider the particular instance of organized overlay systems with a specific concentrate on Distributed Routing Algorithm (DRA). (iii) In third we propose Security Trust that can recognize and shield genuine companions from attack. The attack associates can have their trust wiped out and rejected from a gathering. (iv)In last stage we utilize File Replication outline work for productive record sharing and enhance document accessibility in P2P systems.

5 EECM-FFA Phase

5.1 Initialization

This paper displays another approach utilizing firefly calculation to bunch information. It is indicated how firefly calculation can be utilized to locate the focal point of the client determined number of groups. We utilize the firefly calculation to discover introductory ideal bunch focus and after that enhanced focus to refined them and

enhance Clustering exactness. At that point DRA is a disseminated directing to a particular system area. It is a hearty, versatile, and decentralized framework for effectively document sharing[11]. A security examination of our plan demonstrates that our convention is viable in safeguarding against different attacks. Security Trust empowers neighbor associates to convey proposal identifiers and check free-riders among the companions in a system[12]. This guarantees the gathering identification calculations to recognize attack peers and conquer free-riders to be productive and versatile in vast P2P systems. Document Replication used to share records proficiently and enhance accessibility in P2P systems.

In this module used to introduce the hubs in system topology. We utilized system topology and geography for our system illustrator window (nam window). We have punctuation for make hubs in system artist window. At that point we can make hubs in two sorts like irregular and settled movements. In arbitrary movement we settled range for X and Y, settled specific range then the hubs are arbitrarily create in that scope of man window. In settled movement we give X and Y measurement position for all hubs then every one of the hubs are settled in that specific measurement[13–16].

Sensor hubs know about their own positions. The position data might be founded on a worldwide or a nearby geographic arrange framework characterized by the organization range. Deciding the position of the hubs may be accomplished utilizing a satellite based situating framework, for example, worldwide situating framework (GPS) or one of the vitality productive limitation techniques proposed particularly for MANETs[17–19].

5.2 Distance Calculation

All fireflies are considered as unisex and irrespective of the sex one firefly is attracted to other fireflies. The Attractiveness is proportional to their brightness, which means for any two flashing fireflies, the movement of firefly is from less bright towards the brighter one and if no one is brighter than other it will move randomly. Furthermore they both decrease as their distance increases.

The landscape of the objective function directly affects the brightness of the firefly.
The distance between any two fireflies i and j at xi and xj respectively, the Cartesian distance is determined by equation where xi, k is the k th component of the spatial coordinate xi of the i th firefly and d is the number of dimensions.

5.3 Attractiveness

In the Firefly algorithm, there are two important issues: the variation of the light intensity and the formulation of the attractiveness. We know the light intensity varies according to the inverse square law.

6 Group Formation

Clustering is a valuable system for decreasing vitality utilization in wireless sensor systems (MANET). To accomplish a superior system lifetime execution, diverse clustering calculations utilize different parameters for group head (CH) choice. For instance, the sensors own leftover vitality and in addition the system's aggregate lingering vitality are utilized. In this paper, we propose vitality mindful clustering that fuses both the lingering vitality levels of sensors inside a bunch range and in addition the separations. To accomplish this, we characterize a metric that is ascertained at every sensor in view of nearby data inside its neighborhood. This metric is consolidated inside the CH determination likelihood. Utilizing this metric, one can pick the sensors with low leftover vitality levels to have the best effect on CH choice which brings about CH determination being one-sided to be near these sensors. This outcome in lessening their correspondence vitality cost to the CH.

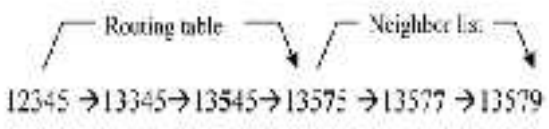
In this procedure, the Clustering convention is a key calculate accomplishing vitality proficiency, so the plan of a vitality effective clustering convention for MANET is essential. In MANETs the sensor hubs are vitality compelled. Subsequently, it is vital to discover a few answers for offer high adaptability and fulfill high vitality effectiveness to drag out system lifetime. One arrangement is by gathering sensor hubs into sets called groups. Clustering accomplishes better lifetime of the sensor arrange by breaking the sensor organize into gatherings of sensors to monitor correspondence vitality. Thus, sparing the vitality and expanding the general lifetime of the system is accomplished. Embracing clustering plan produces two-level progressive system; the more elevated amount and the lower level. The more elevated amount is framed by the hubs that are in charge of accumulating and combining the got information from sensor hubs in the detecting territory and afterward transmit it to a focal processor; such hubs are known as the Cluster Head (CH) hubs. The lower level of the order is shaped by the hubs that are in charge of recognizing the required information from the detecting area and afterward sending it to the relating CH. Each bunch incorporates number of sensor hubs and one group head (CH). CH choice can be brought together performed by the BS or the end client in light of some model. It can likewise be dispersed in nature and performed by the sensors themselves on a confined level. The BS is in charge of preparing information got from sensor hubs to be utilized by the end client. In this paper, we propose a novel dispersed vitality effective bunch head determination calculation in which two elements are consolidated: the sensors' remaining vitality levels and the separations amongst sensors and the CH.

7 EFFICIENT FILE SHARING – FILE REPLICATION PHASE

7.1 File strategy Analysis

In a P2P document sharing framework, over-burden conditions are regular amid blaze swarms or when a server has a hot record. if numerous hubs question for a hot record in hub Gat a period, G will be over-burden, prompting to deferred document inquiry reaction. Record replication is a successful strategy to manage the issue of over-burden condition. By duplicating a hot document to various different hubs, the record proprietor circulates stack over copy hubs, prompting to speedy document reaction. Also, a document inquiry may experience copy hubs before it touches base at the record proprietor, lessening query way length. Consequently, record replication accomplishes high document question proficiency because of query way length diminishment and speedy inquiry reaction. In Server Side, hub G will pick its neighbors K,F,N,O.

A definitive goal of is to accomplish high inquiry productivity and low document replication overhead. In particular, intends to conquer the downside of the past techniques with two objectives. Initially, it plans to limit imitations and accomplish high document question productivity. More imitations prompt to higher question proficiency and the other way around. In what capacity can a replication calculation lessen reproductions without trading off inquiry productivity. Instead of statically repeating a document along an inquiry way, imitates a record in hubs with high question movement of the document, in this way decreasing reproductions while guaranteeing high hit rate and equivalent inquiry effectiveness. Second, instead of relying upon a record proprietor to decide reproduction creation and erasure in a concentrated way, expects to lead the operations in a decentralized way without trading off copy use. Since P2P frameworks can be huge, decentralized replication basic leadership is critical to scaling the framework. To accomplish this goal, utilizes self-versatile strategy in which hubs themselves choose imitation creation and cancellation. Part a huge document into little pieces can build the administration limit of an expansive record quickly. Reproducing document area imply along an inquiry way can likewise enhance record question effectiveness. It can utilize the methods to additionally enhance its execution.



7.2 File Propagation and Replicas

In an organized P2P framework, the inquiry load is appropriated in an imbalanced way. The presence of question awkwardness is affirmed by late investigations of P2P document sharing frameworks which show that hub inquiry examples are vigorously skewed in the frameworks. The question stack unevenness in an organized P2P framework is primarily brought on by three reasons. To start with, document solicitations are steered by an entirely characterized directing calculation and hubs are situated in better places and have distinctive number of neighbors in a P2P overlay arrange. Second, hub interests are distinctive and time fluctuating. There will be more question activity along the inquiry ways from the regular record requesters and the document proprietor. Third, document notoriety is non uniform and time fluctuating. Hubs accepting and sending hot record inquiries encounter more inquiry activity stack. Hubs in some overlay territories with hot records or with more neighbors will encounter more question activity. It is straightforward the last two explanations behind inquiry irregularity. The clarification for the main reason is introduced beneath.

7.3 File Availability

The copy hit rate of various calculations versus the quantity of replication operations when a server is over-burden. We can watch that Client Side creates the minimum hit rate, EAD has higher hit rate than Server Side, and Path prompts to higher hit rate than EAD. Customer Side repeats a document in the record requesters, which may not ask for a similar record later. Likewise, other document demands have low plausibility of going through these imitation hubs. Subsequently, Client Side has low imitation hit rate. Server Side repeats a document close to its proprietor with the end goal that a question for the record has high likelihood to experience an imitation hub before it lands at the record proprietor. The outcome that EAD prompts to higher hit rate than Server Side is especially charming given that they have a similar number of imitations.

Despite the fact that Server Side has high probability for a question to meet an imitation hub close to the document server, it is not ensured. EAD imitates a document at continuous requesters or activity center points, guaranteeing high hit rate. This suggests the viability of EAD to reproduce records in hubs with high inquiry rate, which improves the use of reproductions, and consequently, decreases the query way length. Path replicates records at hubs along a steering way. More imitation hubs render higher probability for a record demand to meet a reproduction hub. Along these lines, Path expands reproduction hit rate and delivers shorter way length. Be that as it may, its productivity is exceeded by its restrictive cost of overhead to keep track of

question ways and keeping up a great deal more record reproductions.

This investigation exhibits the heap adjust among reproduction hubs in every replication strategy. Review that Client Side and Server Side don't consider hub accessible limit, while EAD proactively considers hub accessible limit amid document replication. It abstains from worsening over-burden hub issue by picking hubs with enough accessible limits as copy hubs. Along these lines, it beats Client Side and Server Side by controlling the over-burden hubs, and henceforth, additional overhead for load adjusting or additionally document replication. We quantified the greatest hub usages of all hubs and took the first, 99th percentiles and middle of those outcomes as test results.

The first and 99^{th} percentiles of hub uses framework. Way disseminates stack among considerably more copy hubs, so its heap adjust result is not tantamount to others. In this manner, we didn't exclude the aftereffects of Path into the figure. The figure shows that the 99th percentile of hub use of Server Side is substantially higher than others. It is on the grounds that Server Side depends on a little arrangement of hubs inside a little range around the over-burden record proprietor, which makes these copy hubs over-burden.

8 EXPERIMENTAL RESULTS AND DISCUSSION

This study used ns-2 as the network simulator and conducted numerous simulations to evaluate the FF performance. All sensor nodes are randomly scattered with a uniform distribution. Randomly select one of the deployed nodes as the source node. The location of the sink is randomly determined. This study evaluates the routing performance under scenarios with different numbers of sensor nodes. This study evaluates the following main performance metrics.

8.1 Phase 1:

The following results indicate that the proposed method results in low delay compared to existing framework it also process high speed , high efficiency , throughput when compared to existing framework.

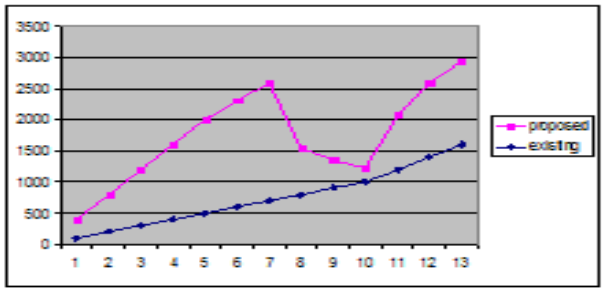


Fig. 2: Comparison on End-To-End Delay Ratio(EECM-FFA vs Existing Clustering Method)

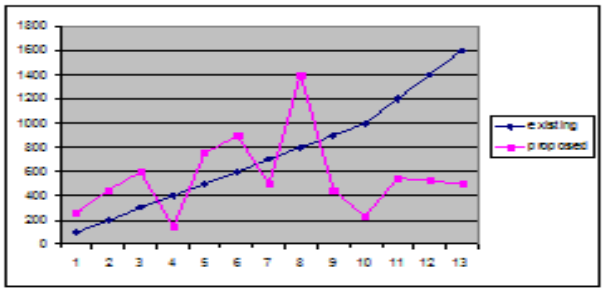


Fig. 3: Comparison on Data Transmission Speed(EECM-FFA vs Existing Clustering Method)

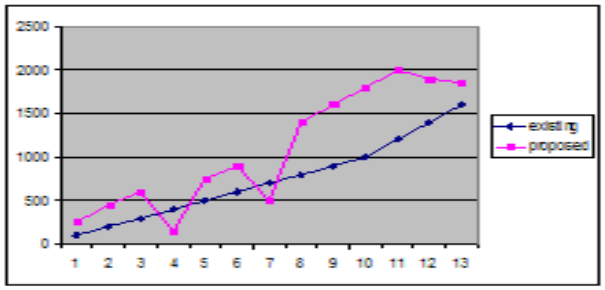


Fig. 4: Comparison on Energy Efficient Ratio(EECM-FFA vs Existing Clustering Method)

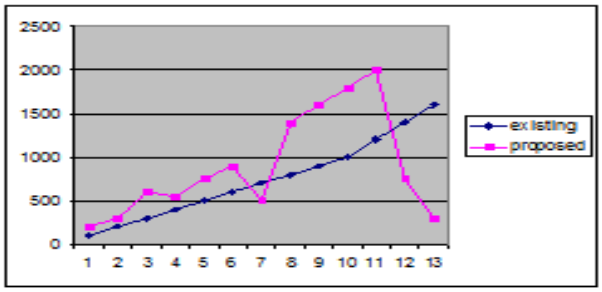


Fig. 5: Comparison on Throughput Ratio(EECM-FFA vs Existing Clustering Method)

8.2 Phase 2:

In Phase 2 Figure 6 Comparison on Time Detection between DRA and Existing method , time is measured in nano seconds , here the proposed method consumes nearly 50% less energy, Figure 7 displays the Impact of False Negative on DRA vs Existing method , the comparison results prove that the false negative rates are less when compared to the existing method , Figure 8 displays the Impact of False Positive on DRA vs Existing method, the comparison results prove that the false positive rates are less when compared to the existing method. Figure 9 exhibits Comparisons on Overhead Ratio DRA vs Existing Method. The overhead cost is reduced upto 40% in the proposed model.

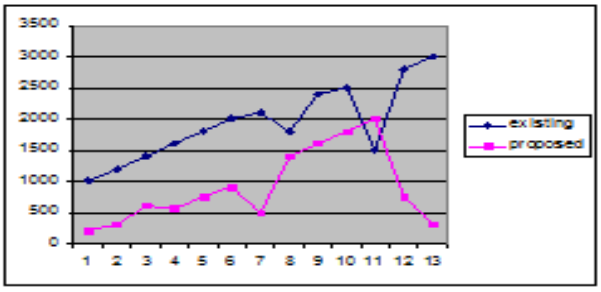


Fig. 6: Comparisons on Time Detection between DRA and Existing Method (in ns))

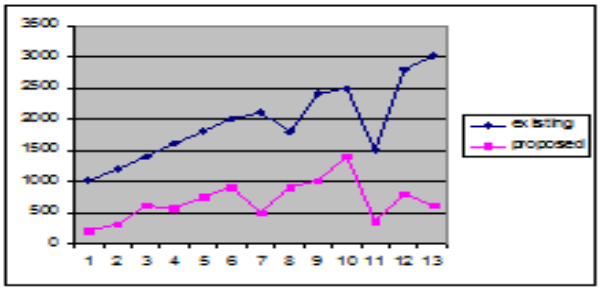


Fig. 7: Impact of False Negative (DRA vs Existing Method)

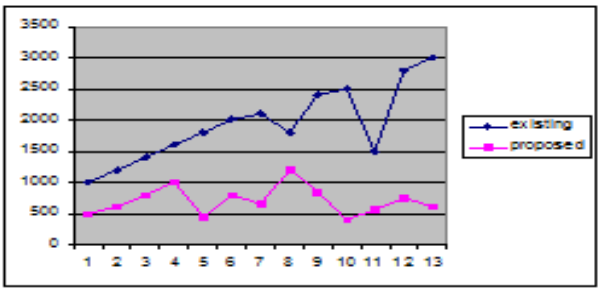


Fig. 8: Impact of False Positive (DRA vs Existing Method)

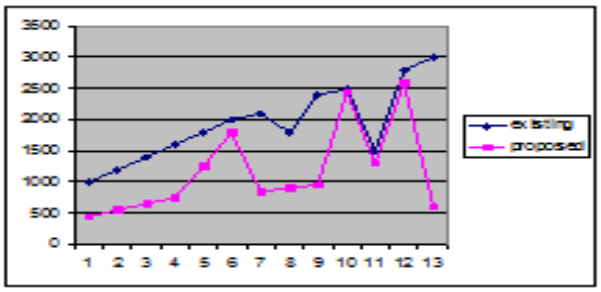


Fig. 9: Comparisons on Overhead Ratio (DRA vs Existing Method)

8.3 Phase 3:

The results of the phase 3 from Figure 10 to 12 indicates the impact of false positive, false negative, malicious nodes impact are less than 30 % when compared to the existing model, whereas Figure 13 exhibits the Impact of Selfish Nodes between Security Trust and existing method the proposed methods produce a constant output for selfish node secure, hence proves to be an secured model.

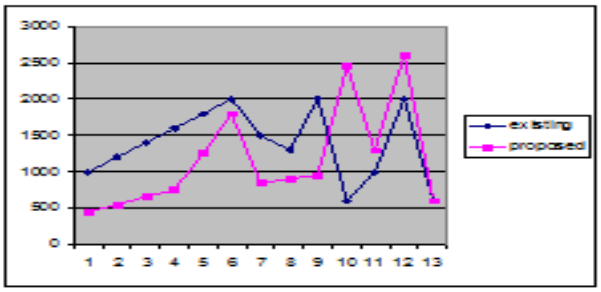


Fig. 10: Impact of False Positive (Security Trust vs Existing Method)

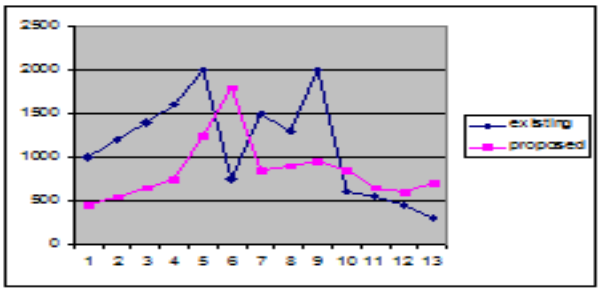


Fig. 11: Impact of False Negative (Security Trust vs Existing Method)

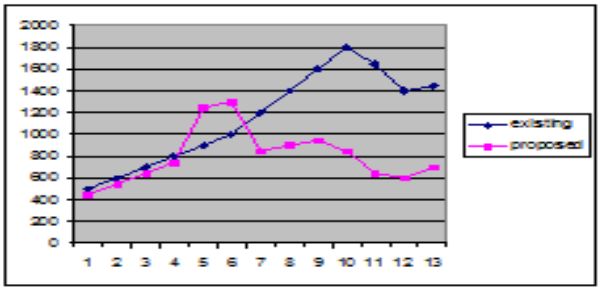


Fig. 12: Impact of Malicious Nodes between Security Trust and Existing Method

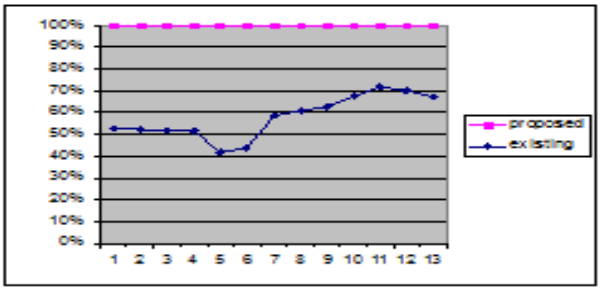


Fig. 13: Impact of Selfish Nodes between Security Trust and Existing Method

9 Conclusion

In this research proposal we have proposed an effective framework with EECM-firefly calculation. A Firefly Algorithm (FA) is a current nature motivated advancement calculation that reproduces the glimmer example and qualities of fireflies. Clustering is a famous information investigation system to recognize homogeneous gatherings of articles in view of the estimations of their traits. Firefly calculation is a swarm based calculation that utilization for taking care of improvement issues. We utilize the firefly calculation to discover introductory ideal bunch Centroids and after that enhanced Centroids to refined them and enhance Clustering exactness. Furthermore, we propose an effective Cluster key administration conspire for secure correspondence in element MANETs portrayed by hub versatility. The procedure underpins effective key updates when a hub leaves or joins a bunch and guarantees forward and in reverse key mystery. The convention likewise bolsters effective key denial for traded off hubs and limits the effect of a hub bargain on the security of other correspondence joins. A security investigation of our plan demonstrates that our convention is viable in shielding against different attacks. Reenactment result affirm that Easy and proficient execution, Easy to comprehend and Parallel usage. This technique delays the system lifetime. We accomplish better connection quality and leftover vitality in the bundle conveyance proportion. The proposed model has less vitality utilization and conveyance inactivity, more flexible, highly exact security.

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