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A Random Walker Cloning Method Based Searching in Peer to Peer (P2p) Network

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Abstract-A network has been developed over a time for resource sharing called peer-to-peer network. Major task of this is to find out the objective data or files. A better scheme with good reciprocity for searching is difficult to find because its recognition is too wavering. Several methods have been found to overcome the problem and most of them were only useful to search popular objects so in our paper we proposed a Cloning Random Walker assisted by Dominating Set (Clone RW+DS) method to identify the correct data or file. In our paper theoretical analysis shows that the system requires little amount of query messages and simulation results depicts that our system can perform a better reciprocity.

Keywords—Cloning RW, Query Message, Popular Object etc

I. INTRODUCTION

The Peer-to-Peer networks have been useful in dispersed resource sharing and the most important task for a Peer-to-Peer function is resource probing to discover the objective data or files in the Peer-to-Peer network. Previously various approaches have been proposed to efficiently find out the objective data or files in a vast network. Query message overflowing is the easiest way but it results in message disintegration. By the mean time to find out the popular data or file is easier than finding the unpopular data or files. The searching efficiency may depend on the popularity objective data or files. On the other hand it is difficult to find the popularity of the objective data or files is difficult to be determined because Peer-to-Peer network varies actively. Therefore to find a good reciprocity in such a changing circumstances is demanding issue. After the above discussion we propose Cloning Random Walker with Dominating Set (Clone RW+ DS) to find out the objective data or files in a Peer-to-Peer network in this paper. Cloning Random Walker timely facsimiles and directs the query message to part of visited nodes neighbor for escalating the searching threads but deliberately and limitedly. A trivial message overflowing can be supplemented to broaden the searching range. To limit the message overhead and network bandwidth utilization wrought by overflowing, only the nodes in the concerned sub-overlay arrangement – dominating set can handle a query message overflowing in our proposed scheme. As a result Clone RW+ DS structures the changes in searching mechanism with vigor against the actives of peer participation. Our proposed system can succeed from the existing system mechanism to effectively discover the popular data or files as well as appreciably limit the overflow of facsimiled query messages and ease off the long delay to discover the unpopular data or files.

The other parts of the article are structured as follows. Section 2 depicts a few associated works about how to locate the objective data or files in a Peer-to-Peer network. Section 3 shows our Cloning Random Walker with dominating Set pattern which can adaptively discover the objective data or files effectively in a active Peer-to-Peer network. Section 4 illustrates the theoretical analysis about the message loads of variety of schemes. Section 5 shows the simulation results and analytical comparisons of our proposed system compared to other searching methods. Section 6 its shows the conclusion results.

II. REALTED WORK

Two types of Peer-to-Peer overlay structure - unstructured overlay network and structured overlay network. Sustaining of overlay network[1-4], does not have any earlier awareness about the network topology and on the whole discovering the objective data and files will take a extended searching time but a minimum allowance cost. In disparity, a structured network [5-8], is continued by ordering resources at scheduled locations. Discovering the objective data or files in a structured network shall take a minimum search time with a elevated preservation cost. Two types of searching schemes in a unstructured Peer-to-Peer network can be further classified as into a blind method and an informed method. By blind method [9-14], peers cannot hold any data or files specific

information but it unintentionally directs the query messages to their neighbor peers to manage the searching process. On the other hand facsimiled query message shall be sent continuously to the received peers and then cause extreme amount of messages to load the network. To limit the facsimiled messages, few researches were proposed to progress the blind methods. Many progressed searching schemes called informed searching methods [15-21], make peers enable meaningful query messages directing by referring to an additional overlay substructure, such as Lightwood[11]. The informed searching algorithm uses either indices to data or files to monitor the query messages to be directed to other proper peers. Cache based mechanism can assure searching of popular data or files. On the other hand when searching unpopular data or files by these existing schemes, the difficulties of directing lots of facsimiled query messages and incurring long response time still persist. To discover the objective data or files by promoting query messages a TTL (Time-To-Live) mechanism is used to reduce the number of forwarding hops before the message is rejected. Selection of better TTL becomes a reciprocity issue and it is difficult to locate the objective data or files although the objective data or files exist in the network or only the popular data or files can be found. The TTL value controls the searching area. The controlled overflowing search approaches [22]. By the mean time Random Walker [9-10], was determined to drastically reduce the amount of query messages in the network. Every Walker plays an data or file finder to locate the objective data or files by unintentionally selecting only one of the presently visited neighbor node as a next hop instead of all the visited neighbor node. Controversially the major shortcoming of Random Walker is it takes a vast time to discover the objective data or files if a wrong neighbor is selected or some of the visited nodes are exiting the network. Therefore a dynamic searching algorithm [23] that resembles overflowing for temporary search and Random Walker for an enduring search is found out to manage an adaptive search for resources meant at reducing the message facsimile by preserving supplementary sub-overlay arrangement. Lightwood [11] reduces the terminated message but it can produce the same message proliferating area as a standard overflowing process manages to see the amount of terminated query message. In initial stages pure overflowing is useful since it rise promptly when the query message crosses in the first several hops can be discovered. On the other hand, a enormous terminated message can be produced in the final stage. If the query message cross more deeply the coverage margin becomes smaller. Lightwood adventures pure overflowing can cover most of search area and preserves a tree-like sub-overlay arrangements- Flood net in the higher hops eradicates most of the terminated message caused by overflowing. A two-phase ticket based search approach [13], tested to suit the searching mechanism to either popular and unpopular data or files. During every round of phase one, a root node initiates to direct the query messages with an initial quantity of implicit tickets that characterize how many search approval can be done at the forthcoming visited nodes, to its neighbor. One implicit ticket will be consumed if a node receives a query message for first time. Then it recursively directs the message with fair ticket number to its entire neighbor if the query message carries an sufficient quantity of implicit tickets. If one search round does not find data or files the total number of implicit ticket might be increased by a ratio to start over another searching process. When the quantity of tickets in some round goes beyond the extreme verge the algorithm might switch to the phase two which preserves ring-like sub-overlay arrangements that connects all nodes consecutively. In phase one if the nodes reached the last round it detach rings into segment and directs the query message to their particular successor recursively till the nodes in each segment are visited. GAB [24] uses a gossip based method to gather universal information about resource popularity to estimate which algorithm is used for a given search. PASH [25] improves hybrid search in GAB for active surroundings. To determine the correct search method and effectively save the query traffic cost and response time by actively identifying the content popularity. QRank a difficulty-aware search hybrid scheme orders the queries by weighting keywords based on resource occurrence frequencies. By using rank values and combining an unstructured protocol with a DHT-based overlay structure, QRank determines appropriate search approaches based on different objective data or files popularities. The flooding-based scheme is adopted for determining popular data or files due to its operation ease whereas the DHT-based scheme is used for searching unpopular objects due to its efficient hit rate and minimum bandwidth cost.

III. PROPOSED SYSTEM

In order to proceed the searching concept to find out the data or files seeking by concerned query messages passing along the network is done by a “Walker”. The Random Walker scheme directs the query message to every visited node neighbor on its way to search the objective data or files in the passive optical networks. When the objective data or files is popular it is identified by small message hops however when the objective data or files is unpopular it is identified using a large message hops. Idea clones in walker make possible for it to identify the objective data or files before it satisfy some conditions that are already defined. The walker will clone more Walker if the travelling hop for the walker reaches the cloning distance by using the same query message till

the cloning time reaches the maximum cloning hop or query message reaches the maximum TTL. More cloned walkers will be produced if there is a large number of unpopular data or files. If it is not possible to hit the target data or files the walker will become a lost walker that is explained by directing the message, and this is because of choosing a neighbor node that is not suitable on its ways to find the objective data or files some additional procedure like lightweight flooding is used for the lost searching to encounter the leaving node the walkers might become blocked such that For this problem, a pure query message flooding might minimize the likelihood of blocking and this may cause lots of query messages.

To perform a lightweight flooding by pruning neighbor links it increase the facsimile of message problem. Conversely the query message through their neighbors can be flooded using only most of the selected peers.
For making a lightweight query message flooding in resource searching in Peer-to-Peer network we use the idea of a dominating set in our proposed system that allow message flooding to the neighbors. The heavy load of message duplication can be prevented by light weight flooding using dominating set. The flooding of query message of all nodes in black is done in pure flooding idea and consequently similar message can be continuously sent to the identical node more than once. All nodes receive 12 messages like (1 + 1 + 3 + 2 + 1 + 3 + 1). Totally 8 (1 + 1 + 1 + 2 +1 + 1 + 1) messages received by all nodes when the two nodes in green flood the
Estimating a minimum sized dominating set is a NP-hard problem. Here we perform by selecting dominating set as close to a minimum one as possible and there is no need of a minimum dominating set although it produce a better performance since the dominating set is near a minimum one.

IV. THEORETICAL ANALYSIS

Besides determining the objective data or files in the Peer-to-Peer network, the reason for major load while finding the data or file is the produced message. Theoretical analysis of our scheme and others is the attempt we perform and the analysis can demonstrate various message loads when the duplicated visit are not taken into account and total query message forwarding hops are considered as the message load. The following representation we provoke the obtained message volumes for various search ideas.

Here,

A. w represents the total no. of initial walkers present in the system.
B. c denotes the no of cloned walker represented as CLONING_NUM.
C. T indicates the maximum TTL for the query message represented as MAX_TTL.
D. D symbolizes the cloning distance represented as CLONING_DIST.
E. K signifies the average degree.

The additional reciprocity problem is the selection of CLONING_DIST (D) and CLONING_NUM (c). Peer-to-Peer network provides the users settings depended on network transmission competency. When only one initial query message is provided by Cloning Random Walker, the amount of the additionally generated query messages before the initial message gets terminated.

$$\frac{[\text{Maximum TTL for query message (T)}] * c}{[\text{Cloning distance (D)}]}$$

In order to magnify the searching area the total quantity additionally produced query message is set very sharp by setting either D very high or c very low. Therefore many additional messages might be produced by setting d very low and c very high and this makes the network to be overloaded.

The message complication for the different schemes is theoretically analyzed because the message produced by searching idea will affect the performance of the network. In the ultimate case we take in to account that one start-to-search node fires up w walkers making c clones every cloning distance (D) until all the message travels till maximum TTL hops without the loss of simplification.

V. CONCLUSION

Since it is difficult for us to find the popularity of the objective data or files in this Peer-to-Peer network we have used two schemes called flooding scheme to identify the unpopular data or files and Random Walker to identify the popular data or files. Controversially network overloading is caused by pure flooding scheme since it produce more amount of query messages while

minimal success rate is produced by Random Walker method to identify the objective data or files. The improved scheme like light flooding helps to minimize the search delay but it has high message overhead and ticket-based flooding minimizes message overhead but increases the search delay. So in order to produce a better scheme that provides good reciprocity among search delay, message overhead and success rate in our proposed paper we have used Cloning Random Walker assisted by Dominating Set(Clone RW+DS) and this system is of the objective data or files whether it is popular or not.

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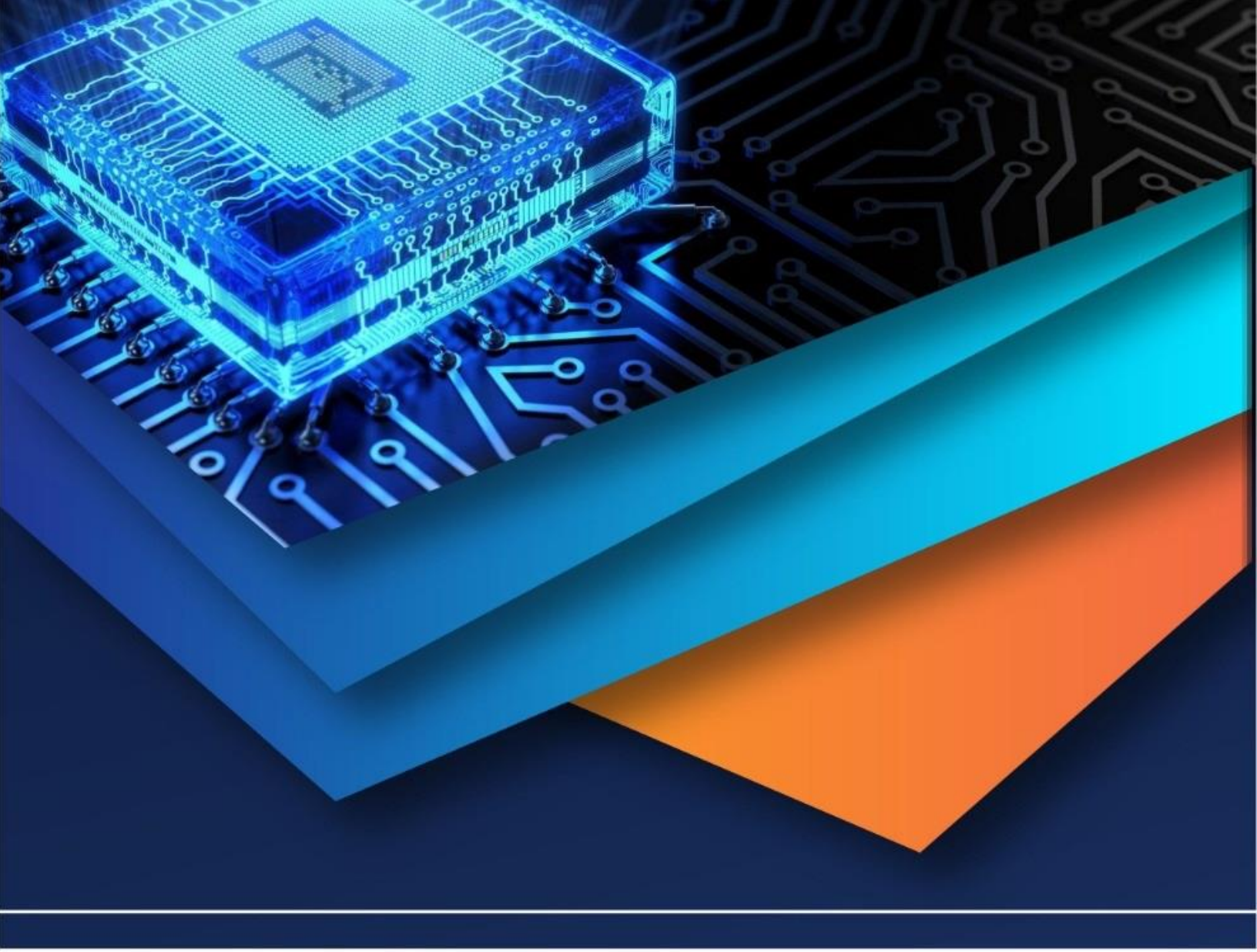

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