ISSN:0975-9646

Uncertainty of Rendezvous and Unsurpassed Random Walk

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Abstract: The P2P is the peer to peer sharing of resources or information through the process of searching among them. This holds a widest process, if it is not carried out by proper methods, it leads to a problematic result which will not retrieve the appropriate information in the appropriate time. Even though this is a typical way of searching, this can be easily solved using the rendezvous problem and random walk. Rendezvous can capture the particular resolution or the information required only if the particular peer having that particular data is constantly not moved to any other peer until it is found during the search. If this fails, it fails to find the needed data. Especially For this purpose we move on to the random walk. This finds that information through its particular successive patterns, even when the information hides in some other nodes or peers. Furthermore, random walk is more advantageous than the rendezvous and solves in a better way, the in abilities of the problems that occurs during the resource discovery.

Keywords: Rendezvous problem, Resource discovery, Random walk, Resolution

1. INTRODUCTION

P2P computing is the sharing of computer resources and services by direct exchange between systems. This includes the cycles of processing process, storing information in cache, and also storing information in disk. This is mainly done for the benefit of the users for quicker search of their required information. This method was found in the year 1960's by the ARPANET for the purpose of exchanging or sharing the resources for the research of US and for their advantageous benefits. ARPANET faced success in the networking of client server where all the peers that are connected through this system can request and response the required or shared data between them. Since it was not self organized, they lacked in the routing which was based on their content or on their context. So, they decided with many researches and they moved on with many ideas and finally got stuck with all of it at some point while applying it, with some drawbacks.

One kind of rendezvous search is asymmetric rendezvous search, where the players can choose separate roles in advance and execute distinct strategies. For example, one can remain stationary while the other actively searches. And the other kind is the symmetric rendezvous search, where the players must execute the same strategy. The efficiency of a rendezvous strategy S is often measured by its competitive ratio

$$\max_{x,y \in Q} \frac{S_1(x, y) + S_2(x, y)}{d(x, y)}$$

The denominator is the minimum possible distance traveled before rendezvous. And S is the worst case deviation of the performance.

In the random paths, each step involves a number of models with number of interesting facts but the mannerism of it seems to be complicated. When they are solved analytically, they are seemed to be difficult than the random walk of usual ones. Using the computable computers or the systems, it is capable of receiving or getting the knowledge about the random walk model. One of it example showsthe length of the random walk as n on Z^d which starts from the orgin with the path level of random n steps. This Z^d, is denoting the reaching of the nodes once and not more than once among the peers. They are selected equally among the node path.

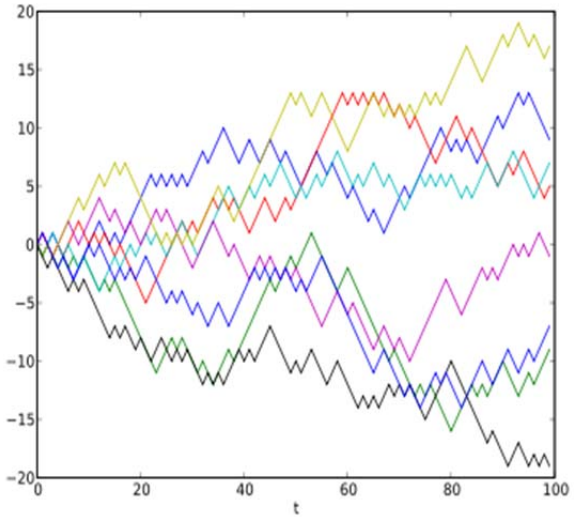

Fig.1. Example of random walk.

The diagrammatic visual representation shows the example of one dimensional eight random walks starting at 0 where the plot shows the current position on the line (vertical axis) versus the time steps (horizontal axis). They move from the point o to its further successive points in a particular way.

Fixing a rendezvous location in advance is not an efficient strategy, so random walk is adapted for searching and discovering the resolutions even when they are moved to any of its peers. This avoids the communication overhead and spending money parsimonious, unwanted wastage of time, and more benefits.

2 Related Work

The resource discovery problems have been faced with many tools and the different approaches, which are resolved using the random walk.

2.1 Qualm of Rendezvous Problem

The rendezvous takes more time for searching the required resolution located somewhere among peers. Applying rendezvous for discovering the required resolution or resources have left the some drawbacks as their major problem. Since using it helps in finding the right information only when the particular condition is satisfied. Data searched must stay in a particular place and only if both the query and their resolutions are in the same location, the resolution required will be discovered. If the data is moved to any other nearer location or some other location, it fails to discover it. So the random walk is adopted, which discovers the resources through succession of steps or following certain structured patterns.

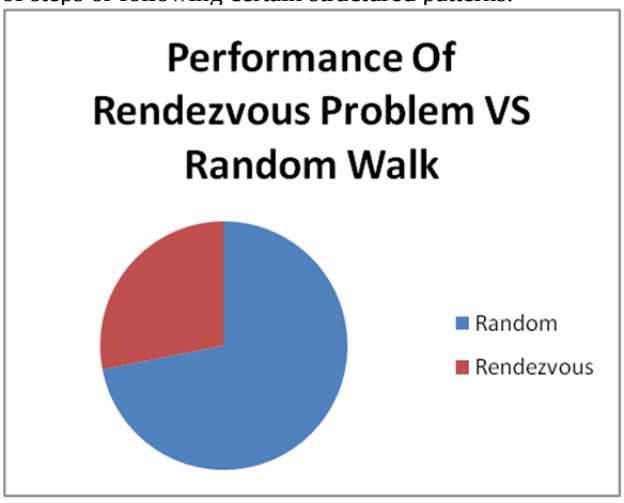

Fig.2. Pictorial representation of Performance Analysis.

The rendezvous and random walk performance analysis is diagrammatically represented for the better understanding.

2.2 Unsurpassed Searching Using Random Walk

Dealing with the lot of expectations, the variables of the random which are associated with
the random walk characterize the graph with its cover time. For the general graphs, the cover time of its estimation which also characterizes, even for the smaller and larger graphs.

3 Rendezvous Contra Random

Rendezvous approaches rely on the compressibility of the information and do not apply in the general case when no prior statistical knowledge of the data is available, which makes to move to the advantageous random walk.

Imagine a perfume bottle opened in the front of a classroom and the fragrance soon drifting throughout the room. The fragrance spreads because some molecules evaporate from the bottle and then collide randomly with other molecules in the air, eventually reaching your nose even though you are hidden in the last row. We wish to develop a model for this process which we can then use as the basis for a computer simulation of a random walk. Once we have tested the simulation, we can virtually see what the random walk taken by a perfume molecule looks like, and be able to predict the distance the perfume's fragrance travels as a function of time. The model we shall develop to describe the path traveled by a molecule is known as random walk.

It is stated as random because it is chance collisions that determine the direction in which a perfume molecule travels, and "walk" because it takes a series of "steps" for the molecule to get from here to there. The same model has been used to simulate the search path of a foraging animal, the fortune of a gambler, and the accumulation of error in computer calculations, among others.

Random walk is capable of Self-organizing, load balanced, fault-tolerant, and also it is scalable which guarantees on numbers of hops to answer a query, which has a major difference with rendezvous problem.

The problem of rendezvous is it can retrieve information only if the pre-known stored information is same and the searching place for that same information is matched during the process of searching the particular information according to the user's needs. Suppose if the information searched in the pre-known place is not available for the user's view during their way of search. Due to this critical situation, the desired view of the users become impossible and they will be returned nothing about their required query.

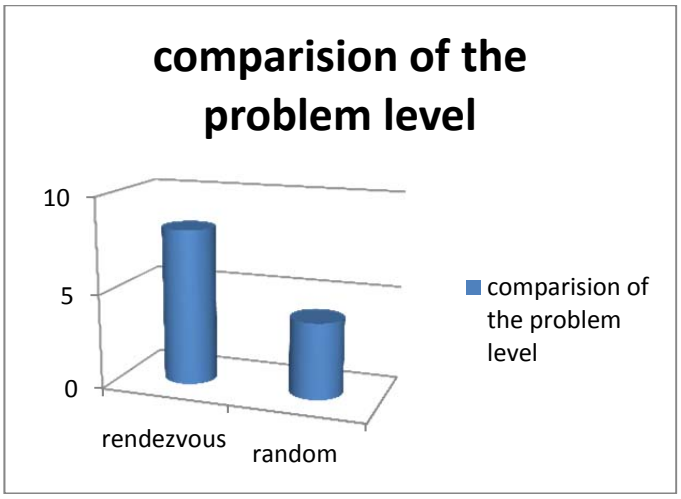

Fig.3 Comparative Analysis of the problem level of rendezvous and random walk.

The random walk helps in viewing the resolution of the query raised by the users by their successive steps of any particular pattern they have chosen already for the specific purpose of searching the required information. There are no chances of repetitive searches in the same peer, which saves time, and the avoidance of communication overhead. The information for the query raised by the user or the query resolution can be found using random walk, there are no chances of returning without the data, since there is data persistence in the system.

Every query is set to be searched in a particular grid patterns or of some particular patterns from one node to another. If the required information is not present in a particular peer, it immediately moves to the neighbor peer

or to its next peer according to their patterns involved. Until the resolution of the query is resolved the query is transmitted using random walk from one system to the other, when the required information is found. The user is responded with the query resolution that is captured.

4 Relatively Favourable Random Walk

The random walk is the advantageous algorithm having stronger properties that is used in peer to peer network to obtain the required resources, which is better than the rendezvous problem.

Random walk can be better explained by an example in a clear way. Consider a flat where many of the family lives with their family members together in that flats at their individual allotted houses. There arrives a guest or a person Z in searches of the particular person X having the information I.

The person Z knows only that the person X having the information I lives in this flat, but the person Z doesn't know that in which house the person X is located or he/she lives. So the person Z starts his search for that person X which is considered as the node or peer. The person Z starts to search from home to home in successive steps for the person x having the information I by knocking at each doors. This situation occurs only when no one knows the house of the person X.

Now consider that the home of the person X is known by some persons in the ground floor and states to the person Z that person X lives in the third floor of that flat. Then the person X, who is in search of the person Z for a long time, starts to moves from the ground floor successively to the third floor. The person Z cannot reach the third floor directly. He/she moves on from the ground floor to the first floor and so on in a successive manner, and finally reaches the third floor. This pattern of successive steps is known as the random walk.

Suppose in some cases, if the information is not with the person x and the person x states that the information is with the person Y. The person Z follows some successive patterns in a successful manner and reaches the person Y and gets the information I.

Consider n number of person living in the flat or apartment with their family members happily in their individual houses. There arrives a person Z in search of the information I which is with some person. Now the person Z knows that the information I is with the person X and then reaches the location of the person X. The person X is located in the flat in the 3rd floor in the plot D, which is known to the person Z who is in search of person X for the information I. The person Z goes to the particular flat, reaches the 3rd floor and then reaches the plot D and knocks and then the person X comes out. Well, the person Z asks for that particular information to the person X, now the person X states that the information I was moved to the person Y. But the person Z does not listen to the statement of person X. It just checks whether the person X has the information I and it comes to know that the person X does not have the information I with it. The person Z reaches back without collecting the information I by not moving to the other destination stated by the person X.

This is where the rendezvous problem occurs. The peer having particular needed information transfers the information to any other peer, it does not search for the information in any other peers and gets back. According to rendezvous, the pre-informed status of information should be as it is, without getting modified. If so, it is modified, the needed information I, will not be searched, it just goes and checks for the information in the pre-informed peer according to the pre-informed status, and returns back when the data which is searched for a long time is not found there.

This is the drawback of the rendezvous. It also has the chance of checking the same peer for the same information more than once which leads to the river of disadvantages. But the random walk does not repeatedly search for the same information in the same node or peer more than once and at the same time it solves the problem through its successive steps of searching for the information in each peer through some of the sorted particular pattern placed with successive steps. This shows how the random walk is more powerful than the rendezvous.

5 Conclusion

Rendezvous problematic occurs during the information in a particular node gets misplaced which leads to a disadvantageous loss of everything such as time latency, overhead of communication, and so on. These are overcome by the random walk that leads to the data persistence and the easiest capturing of data through its tactic successive steps. This show the random walk is unsurpassed which solves the drawbacks of rendezvous. Some tools and methods can also be added in future for quicker resolving of inquiries that are raised.

Finally, the random walk shows the very efficient way of searching the wanted data in various critical scenarios and further improvements can also be made by innovative implementations.

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