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ENHANCE THE QUALITY AND PERFORMANCE OF GRID COMPUTING USING BCO AND PREFIX SEARCH TREE

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Abstract: Grid computing is deals with mechanism of dividing data into different grids so that user can easily locate it. It's also used to increase security like in case if one grid gets destroy the all the remaining data in other grids will be safe. There are many problems occur in the grid computing while enhancing the quality. The artificial bee colony optimization is used to enhance the quality of the system. In our purposed methodology, we are going to use the scheduling technique to enhance the quality of the grid computing. Here to enhance performance of grid computing we are going to use two algorithms, here we are going to integrate BCO and prefix search tree to enhance the performance of grid computing while searching information from different-different grids.

Keywords: Grid, BCO, prefix tree, searching, upload data.

1. INTRODUCTION

Grid computing is the new era of the computer applications. It is currently the big application area. Grid computing is used to aggregate the power of distributed resources. It also used to provide the non trivial services to the users. Grid computing is a type of distributed computing that enables the creation of a computational infrastructure. It uses the coupling wide area distributed resources, databases, storage servers, high speed networks, super computers and clusters for solving large scale, massive and complex problems. Grid computing is generally compared with the cluster computing.[1] But the cluster computing is different from the grid computing in physical logical and technical environment.

Architecture of grid Computing

A grid's architecture is often described in terms of layers, where each layer has a specific function. The higher layers are generally user-centric, whereas lower layers are more hardware centric, focused on computers and networks.

Network Layer: The lowest layer is the network, which connects grid resources.

Resource Layer: it relies above the network layer. The actual grid resources, such as computers, storage systems, electronic data catalogues, sensors and telescopes that are connected to the network.

Middleware Layer: The middleware layer provides the tools that enable the various elements to participate in a grid.

The middleware layer is sometimes the brains behind a computing grid.

Application Layer: The highest layer of the structure is the application layer, which includes applications in science, engineering, business, finance and more, as well as portals and development toolkits to support the applications. This is the layer that grid users see and interact with. The application layer often includes the service ware, which performs general management functions like tracking who is providing grid resources and who is using them.

Types of Grid Computing

Grid computing has the many [2] types. The grid computing has the many uses, according to their uses it divides into many parts.

Computational Grid:

These grids provide secure access to huge pool of shared processing power resources. These resources are suitable for high throughput applications.

Data Grid:

Data grids provide an infrastructure to grid computing. It used to support data storage, data discovery, data handling, data publication, and data manipulation of large volumes of data. The data is stored in various heterogeneous databases and file systems.

Collaboration Grid:

Collaboration is possible using the grid. For instance, persons from different companies in a virtual enterprise can

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work on different components of a CAD project without even disclosing their proprietary technologies.

Network Grid:

A Network Grid provides fault tolerant and high performance communication services. Each grid node works as a data router between two communication points, providing data caching and other facilities to speed up the communications between such points.

Utility Grid:

This is the ultimate form of the Grid, in which not only data and computation cycles are shared but software or just about any resource is shared. The main services provided through utility grids are software and special equipments. For instance, the applications can be run on one machine and all the users can send their data to be processed to that machine and receive the result back.

Bee colony optimization

Bee Colony Optimization is nature inspired technique. It is based upon the swarm intelligence technique. It is meta-heuristic technique which is concern with memory based searching. Bee colony optimization technique is used to find the best path from the number of the solutions. It is bottom-up approach used to solve complex combinatorial problems. It is decentralized and self organizing technique [3]. There are two types of bee which are present in the bee hive. These are in hundred and thousand in numbers which work together. There is one Queen Bee which presents in the bee hive and lay eggs. Drone are also in many number which companion with female queen bee.

2. LITERATURE SURVEY

A.C.KALADEVI, et.al, [2013]: In every system efficient utilization of resources is a major issue. In grid environment is dynamic and it allows the clusters to move around freely. Here grid acts as a supercomputer to the users by handling voluminous data. So here it's important the proper allocation resources, but resource discovery and scheduling of jobs is a challenging issue in grid. Here a new approach present to scheduling jobs in grid using[4] Bee Colony algorithm. Bee Colony is a recently popular heuristic algorithm used for optimization

Quan-Ke Pan et.al,[2013]: Here it provides solution for the real-world hybrid flow shop scheduling problem resulting from a steelmaking process. It present a mixed integer mathematic model based on a comprehensive investigation and develop a heuristic method and two improvement procedures for a given schedule based on the problem-specific characteristics. Here they propose an effective artificial bee colony algorithm with the job-permutation-based representation for solving the scheduling problem.[5] K. Karnavel, et.al, [2011]: Software engineering is all about encompasses knowledge, tools, and performing software design, and methods for defining software requirements, software construction, software testing, and software maintenance tasks. Software development practice,[6]

testing accounts for as much as half of total development efforts. Here they proposed system which uses to reduce the application testing moment, easily can find out bug and solve the bug by Regression Testing.

A.C.KALADEVI et.al,[2013]: The grid environment is dynamic and it allows the clusters to move around freely because an efficient utilization of resources is a vital factor for any environment and grid acts as a supercomputer to the users by handling voluminous data. Here they allocation of the available resources is important.[7] Resource discovery and scheduling of jobs is a challenging area in grid. According to new approach for scheduling jobs in grid using Bee Colony algorithm and the discovered resources are advance reserved for future.

Xin Zhang et.al,[2013]: Optimal design problems of electromagnetic devices are generally multimodal, non-differentiable and constrained. This makes metaheuristic algorithm a good choice for solving such problems. In this paper, a newly developed metaheuristic algorithm is presented to address the aforementioned issues. The proposed algorithm is based on the paradigm of artificial bee colony (ABC). A drawback of the original ABC algorithm is because its solution variation is only one dimensional.[8] It decreases its convergence speed. In this paper a one-position inheritance scheme is proposed to alleviate this drawback. An opposite directional search is also proposed to accelerate the convergence of the ABC algorithm.

Fangpeng Dong and Selim G. Akl, [2006]: discuss about the grid computing. As popularity of the Internet and the availability of powerful computers and the high speed networks as low-cost commodity components are changing the way we use computers today. These technical opportunities have led to the possibility of using geographically distributed resources to solve large-scale problems in science, engineering, and commerce [9]. Recent research on these topics has led to the emergence of a new paradigm known as Grid computing.

Leyli Mohammad Khanli, et.al, [2011]: discuss about the resource matching problem in grid computing. The grid infrastructure provides a way to execute applications over autonomous, distributed and heterogeneous nodes by secure resource sharing among individuals and institutions. Typically, a user can submit jobs to a grid without necessarily knowing where it will be executed. The grid resource management system used to distribute such jobs among a heterogeneous pool of servers. [10]It tries to optimize the resource usage.

3. PROPOSED WORK

Swarm intelligence is type of learning; it works on the basis of learning from past experience. If we talk about bio-inspired techniques then lots of swarm intelligence algorithms cone into existence. Bee colony optimization is one of the algorithm which comes under the categories of swarm intelligence. Bee Colony Optimization is nature inspired technique. It is based upon the swarm intelligence

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technique. It is meta-heuristic technique which is concern with memory based searching. Bee colony optimization technique is used to find the best path from the number of the solutions. It is bottom-up approach used to solve complex combinatorial problems. It is decentralized and self organizing technique .There are two types of bee which are present in the bee hive. These are in hundred and thousand in numbers which work together. There is one Queen Bee which presents in the bee hive and lay eggs. The scheduling is also used in the grid computing, as: Schedulers are types of applications responsible for the management of jobs, such as allocating resources needed for any specific job, partitioning of jobs to schedule parallel execution of tasks, data management, event correlation, and service-level management capabilities. Here our main concern is to enhance the performance and quality of data in grid system. And here we are going to use Bee colony optimization and prefix searching tree to do this task. The work will do in NetBeans under the java scripting. Here we will create number of grids in database and perform designs on them.

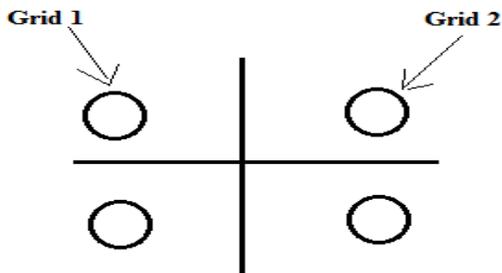


Figure 1: Grid Computing

These schedulers may be constructed with a local scheduler implementation approach for specific job execution, or another meta-scheduler or a cluster scheduler for parallel executions. In our purposed methodology, we are going to use the scheduling technique to enhance the quality of the grid computing. Suppose there are four types of grids having different kind of data, we have to find the information, like xyz. The data is stored in the different grids. We check all the grids by using the bee colony optimization with scheduling techniques. By applying these techniques, we are able to collect the full information. The access of the information becomes easy.

To decrease load and to enhance performance we are going to use prefix tree algorithm in grid searching. Here we will give last character of string as a input to prefix algorithm. Now it will start performing search from back side and as we know that if we search from back side then we will find less files to search instead from front side search which will decrease the workload of searching process and if the workload is less then it will automatically gives best performance.

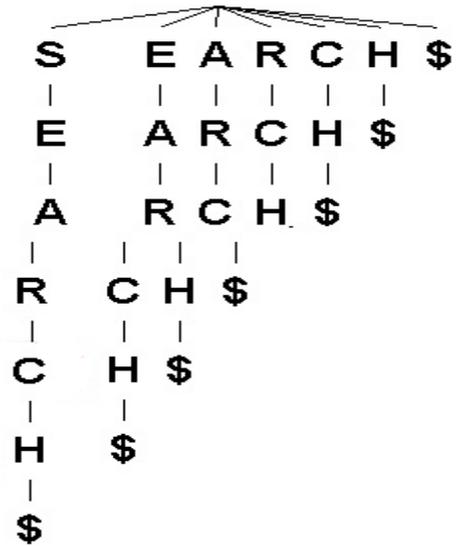


Figure 2: prefix tree search

Figure 2 shows the working model of our scenario. It contains each working step of our work.

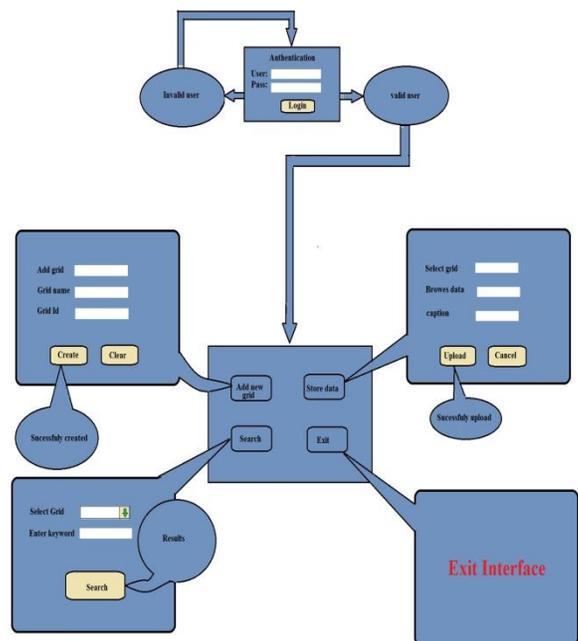


Figure 3: Overall Design

Figure 3 showing five major modules, it contain authentication, menu interface, creating grids, storing data, searching and exit modules. Here only authenticated users can only access this interface. In initial we need to create number of grids and then after we will store information into them. Then we perform search and for search it provides you to select one particular grid. As according to bee colony we need to choose a single grid and then after we enter a keyword to search and the searching should be done prefix searching technique which is the fastest search as

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comparison to others. So here it will take very less time to find data from grid.

4. CONCLUSION AND FUTURE WORK

Here this proposed schema helps to enhance quality performance of grid system. It helps to find more accurate data in less time means it provides better quality with better performance. But in future work we will analyze its loop holes and try to fix them some better way.

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