SURVEY ON GRID COMPUTING AND PARALLEL COMPUTING

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Abstract- Grid computing is useful for scientific workloads. It has a basic foundation of distributed computing, parallel computing, mainframe and many more computing paradigms. Understanding of proper classification of grid computing services and scheduling algorithms are needed to exploit it. This paper focuses on survey based on scheduling of grid and parallel computing. Thus this paper provides a roadmap for students, and researchers to study available literature.

Key words- Parallel computing, Grid computing, Applications of Grid, Application of Parallel Computing, Parallel computer.

INTRODUCTION

Parallel computing could be a sort of computation during which several calculations are administered at the same time, in operation on the principle that giant issues will typically be divided into smaller ones, that are then resolved at the same time ("in parallel") [1]. In science, it is always required to solve the big problems in a reasonable amount of time. This requirement led us to develop massively parallel system to solve problems like videos processing to scientific calculation. Computer architecture is divided by their number of instruction and number of data on which these instruction works. They are divided by Flynn's taxonomy. Flynn's taxonomy is a classification of computer architectures, proposed by Michael J. Flynn in 1966[7]. This taxonomy say there are 4 type of Computer system SISD (Single Instruction Single Data), SIMD (Single Instruction Multiple Data), MISD (Multiple Instruction Single Data) and MIMD(Multiple Instruction Multiple Data).

Grid computing is that the collection of computing resources from multiple locations to achieve a standard goal. The grid may be thought of as a distributed system with non-interactive workloads that involve an oversized range of files [2]. In grid computing environment each computing resource is fully capable of doing its works. Grid computing is always done in loosely coupled systems.

APPLICATIONS

Grid computing Applications

Typical applications that need grid computing are forecasting and military state of affairs simulations, database etc, where we need our works has to done fast and with less resources:

High-throughput computing support:- High-throughput computing support permits applications to use grids to place unused processor cycles to figure in usually loosely coupled [3]. For example there are 3 computing devices and each can do all sort of work, and there are two computing devices who are

working on full capacity and one is sitting ideal, then the overall throughput is less than that can be achieved.

Resource sharing: In Grid computing there may be chances that all the computing locations have different number / sort of resources. They can be shared in several completely different organizations that enable alternative organizations (i.e. users) to access them. This will reduce the cost of computation.

Data Driven computing: Modern database servers also use grid computing for various purpose. They can use remote execution-program and data is sent to the remote server for execution, remote data extraction- data can be extracted from remotely available server by distributed SQL and remote process execution- execute PL/SQL block of code on least loaded remote server.

Parallel Computing Applications

Parallel computing can be used in various fields, where we can divide the problem in sub-parts and each part can be solved parallel. Some of fields are:

Computer graphics and Gaming: creating graphics in computer is very lengthy task. If we create some scene sequentially then it will took lots of time, although we know, we can create various objects parallel. In computer games, we have to create new scene vary fast in user interaction.

Weather Forecasting: Weather forecasting also require lots of processing of data to get conclusion and it should be done in time bound manner.

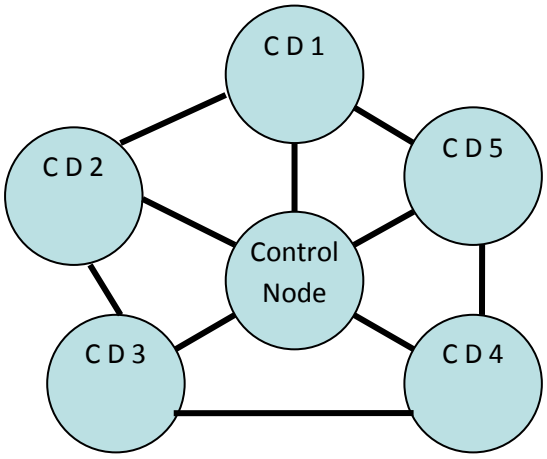
Database Centric Applications: Extracting useful information from database is also requires applying complex business rules and processing. Database software must also runs its queries parallel, so that we can get right information in right time.

Statistics: Parallel processing can be used in statistical problems also like Least Median Squares Regression, Random Number Generators, Parallel Monte Carlo and Extensions, Monte Carlo Estimation of Multidimensional Integrals [5].

There are lots of other areas where parallel computing is used like Medical imaging and diagnosis, Pharmaceutical design, advanced graphics and virtual reality, particularly in the entertainment industry, Bioscience, Biotechnology and Genetics etc[6].

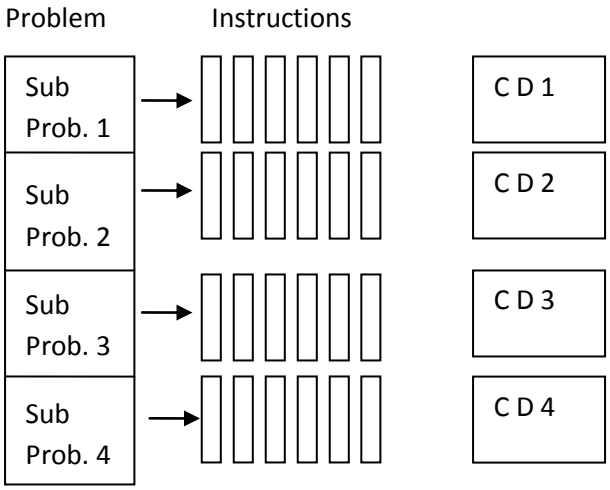
Areas Where Grid and Parallel Computation Cannot be Used: There are some areas or some scene where this type of computing methodology can not be used :

- If data required for one sub-problem is dependent on previous or other sub problems output. Then here is data dependency.
- If problem cannot be sub divided in parallel executable parts.



C D : Computing Device

Figure 1 Grid Computing



C D: Computing Device

Figure 2 Parallel Computing

CONCLUSION:

Grid computing and parallel computing is the requirement of today's computing environment. There are lots of application areas where they can be used. For using these methodology we have to first develop algorithms which can be executed in concurrent manner.

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