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INTRODUCTION TO GRID COMPUTING AND ITS BENEFITS IN COMPUTER ENVIRONMENT

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ABSTRACT:

Computers today have great processing power, even on the lowliest of machines. During an average working day, most of this computational potential lies unutilized by a user. The standard tasks for an average user's computer vary very little, usually including word processing, Internet browsing, spreadsheets and presentations. These tasks use a small percentage of the processor's potential. The rest is idle, wasting a resource which could otherwise be harnessed. In a grid computing environment, computers are linked together, so that a task on one machine could utilize the unused processing power on another machine to execute their tasks faster. This arrangement minimizes wasted resources and increases efficiency considerably, as a task split over multiple machines takes significantly less time to computer.

Keywords: Grid computing, Working of Grid, Benefits

Introduction

Grid computing is the next step in the evolution of networking. As efficiency and speed become important criteria, computational grids have emerged as a viable alternative to maximizing processing resources. This article takes a look at the definition of grid computing, and how it works. Most people are familiar with the concept of a power grid, where various sources of electricity are linked together to supply power to a certain geographical location. The concept of grid computing is very similar, where computers are linked together in a grid to provide a greater computational resource. Grid computing is an arrangement of computers, connected by a network, where unused processing power on all the machines is harnessed to complete tasks more efficiently. Tasks are distributed amongst the machines, and the results are collected to form a conclusion. The advantage of grid computing is that it reduces the time taken to complete tasks, without increasing costs.

Grid :

In a Grid Computing the Words come from the concept :Graing of crisscrossed Parllel bars. Grid is a network of horizontal and perpendicular Lines uniformaly spacedby means of a system of coordinates.In Grid computing the computational data and resources are implementing in a Grid Network.

Grid Computing:

Grid computing can mean different things to different individuals. This view of grid computing becomes pervasive and individual users (or client applications) gain access to computing resources (processors, storage, data, applications, and so on) as needed with little or no knowledge of where those resources are located or what the underlying technologies, operating system, hardware and so on are. Grid computing is the collection of computer resources from multiple locations to reach a common goal. The grid can be thought of as a distributed system with non-interactive workloads that involve a large number of files. Grid computing is distinguished from conventional high performance computing systems such as cluster computing in that grid computers have each node set to perform a different task/application. Grid computers also tend to be more heterogeneous and geographically dispersed (thus not physically coupled) than cluster computers. Grids are a form of distributed computing whereby a "super virtual computer" is composed of many networked loosely coupled computers acting together to perform large tasks. For certain applications, distributed or grid computing can be seen as a special type of parallel computing that relies on complete computers (with onboard CPUs, storage, power supplies, network interfaces, etc.) connected to a computer network (private or public) by a conventional network interface, such as Ethernet. This is in contrast to the traditional notion of a supercomputer, which has many processors connected by a local high-speed computer bus. Grid Database Design reveals what will be coming in the near future, allowing database and systems administrators, programmers, and executives to get beyond the rumblings about this up-and-coming model and learn what Grid can offer to benefit their organizations.

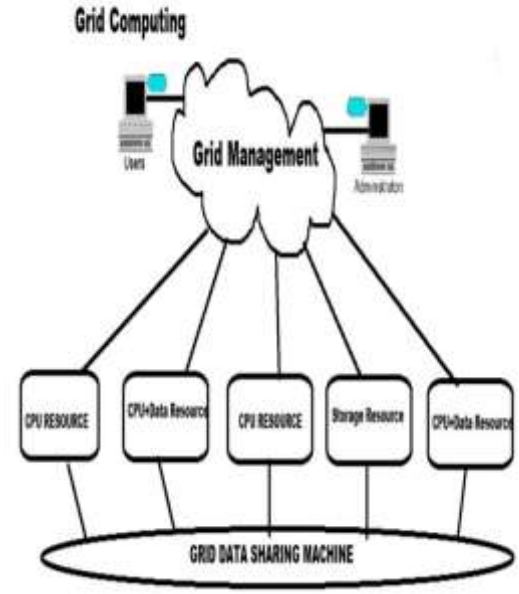

Fig: 1 Organization of Grid Computing

Working of Grid Computing:

A scientist studying proteins logs into a computer and uses an entire network of computers to analyze data. A businessman accesses his company's network through a PDA in order to forecast the future of a particular stock. An Army official accesses and coordinates computer resources on three different military networks to formulate a battle strategy. All of these scenarios have one thing in common: They rely on a concept called grid computing. At its most basic level, grid computing is a computer network in which each computer's resources are shared with every other computer in the system. Processing power, memory and data storage are all community resources that authorized users can tap into and leverage for specific tasks. A grid computing system can be as simple as a collection of similar computers running on the same operating system or as complex as inter-networked systems comprised of every computer platform you can think of.

Feature of Grid Computing:

Features

1. Offers an introduction to the terminology of computing, databases, and relational databases
2. Defines where Grid is now, its major players, and its component parts
3. Provides a list of commercial and academic Early Adopters
4. Highlights the security tools that enable system authentication, cryptography, database security, and more
5. Covers the hardware that makes a Grid system run, including Grid-specific components
6. Examines the role of metadata in Grid evolution
7. Discusses parallelism in database design and how it can be applied to a Grid environment
8. Explains end user interaction with distributed databases and reviews various ideas of database design

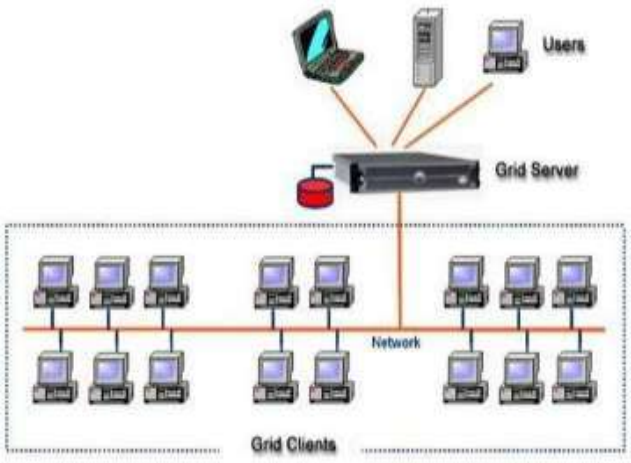

Fig:2 Grid Network

Advantages of Grid Computing

- Can solve larger, more complex problems in a shorter time
- Easier to collaborate with other organizations
- Make better use of existing hardware

Disadvantages of Grid Computing

- Grid software and standards are still evolving
- Learning curve to get started
- Non-interactive job submission

Benefits of Grid Computing

• Grid computing enables organizations to aggregate resources within an entire IT infrastructure no matter where in the world they are located. It eliminates situations where one site is running on maximum capacity, while others have cycles to spare.

• Organizations can dramatically improve the quality and speed of the products and services they deliver, while reducing IT costs by enabling transparent collaboration and resource sharing.

• Grid computing enables companies to access and share remote databases. This is especially beneficial to the life sciences and research communities, where enormous volumes of data are generated and analysed during any given day.

• Grid computing enables widely dispersed organizations to easily collaborate on projects by creating the ability to share everything from software applications and data, to engineering blueprints.

• Grid computing can create a more robust and resilient IT infrastructure better able to respond to minor or major disasters.

• A grid can harness the idle processing cycles that are available in desktop PCs located in various locations across multiple time zones. For example, PCs that would typically remain idle overnight at a company's Asian manufacturing plant could be utilized during the day by its European operations.

CONCLUSION

Grid Database Design reveals what will be coming in the near future, allowing database and systems administrators, programmers, and executives to get beyond the rumblings about this up-and-coming model and learn what Grid can offer to benefit their organizations. The grid computing concept isn't a new one. It's a special kind of distributed computing. In distributed computing, different computers within the same network share one or more resources. In the ideal grid computing system, every resource is shared, turning a computer network into a powerful supercomputer. With the right user interface, accessing a grid computing system would look no different than accessing a local machine's resources. Every authorized computer would have access to enormous processing power and storage capacity.

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