Research Article Impact Factor: 0.621 ISSN: 2319-507X
SS Thangan, IJPRET, 2014; Volume 2 (9): 206-212 IJPRET

INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

GRID COMPUTING

PROF. S. S. THANGAN, PROF. S. A. KARALE

Assistant Professor, Department of Computer Science And Engineering, IBSS COE, Amravati.

Accepted Date: 27/02/2014 ; Published Date: 01/05/2014

Abstract: Grid computing has been a buzzword in information technology since past few years. Grid computing is an infrastructure involving collaboration of computers, databases & network resources available, to perform manipulation of intensive and large scale data set problems. The hike in the complexities of computational problems in modern era of science and technology forced the engineers and scientists to cross the organizational boundaries to get desired data manipulation. The best logical solution to this issue is distribution of the problem set over multiple computational resources/nodes. Several solutions to grid computing has been developed and are still evolving, since the notion of Grid sprang up in mid 1990s, most of which came from the academic research projects. This paper presents an introduction to Grid computing providing insight into the essential features, architecture, scope and challenges of grid computing. The early efforts in Grid computing started as a project to link supercomputing sites, but have now grown far beyond their original intent. In fact, many applications can benefit from the Grid infrastructure, including collaborative engineering, data exploration, high-throughput computing, and of course distributed supercomputing. Moreover, due to the rapid growth of the Internet and Web, there has been a rising interest in Web-based distributed computing, and many projects have been started and aim to exploit the Web as an infrastructure for running coarse-grained distributed and parallel applications. In this context, the Web has the capability to be a platform for parallel and collaborative work as well as a key technology to create a pervasive and ubiquitous Grid-based infrastructure.

Keywords: Content Based Image Retrieval (CBIR),Clustering Algorithms.

Corresponding Author: PROF. S. S. THANGAN

Access Online On:

www.ijpret.com

How to Cite This Article:

SS Thangan, IJPRET, 2014; Volume 2 (9): 206-212

PAPER-QR CODE

INTRODUCTION

The popularity of the Internet as well as the availability of powerful computers and high-speed network technologies as low-cost commodity components is changing the way we use computers today. These technology opportunities have led to the possibility of using distributed computers as a single, unified computing resource, leading to what is popularly known as Grid computing. The term Grid is chosen as an analogy to a power Grid that provides consistent, pervasive, dependable, transparent access to electricity irrespective of its source. A detailed analysis of this analogy can be found in. This new approach to network computing is known by several names, such as metacomputing, scalable computing, global computing, Internet computing, and more recently peer-to- peer (P2P) computing.

Grids enable the sharing, selection, and aggregation of a wide variety of resources including supercomputers, storage systems, data sources, and specialized devices (see Figure 1)that are geographically distributed and owned by different organizations for solving large-scale computational and data intensive problems in science, engineering, and commerce. Thus creating virtual organizations and enterprises as a temporary alliance of enterprises or organizations that come together to share resources and skills, core competencies, or resources in order to better respond to business opportunities or large-scale application processing requirements, and whose cooperation is supported by computer networks.

The concept of Grid computing started as a project to link geographically dispersed supercomputers, but now it has grown far beyond its original intent. The Grid infrastructure can benefit many applications, including collaborative engineering, data exploration, high-throughput computing, and distributed supercomputing.

A Grid can be viewed as a seamless, integrated computational and collaborative environment (see Figure 1). The users interact with the Grid resource broker to solve problems, which in turn performs resource discovery, scheduling, and the processing of application jobs on the distributed Grid resources.

I. LITERATURE REVIEW

Recently, lot of work has appeared in the literature on the problems of the computational grid. A variety of problems have been studied which range from estimating capacity limits, optimal routing, and queuing behavior for grid computing to distributed molecular modeling for drug design on the World-Wide Grid. The summary of the articles published in the last 10 years is cited here under in chronological order.

The term "Grid" is increasingly used in discussions about the future of ICT infrastructure, or more generally in discussion of how computing will be *done* in the future. Unlike "Cloud computing" which emerges and belongs to an IT industry and marketing domain, the term "Grid Computing" emerged from the super-computing (High Performances Computing) community (Armbrust, Fox et al. 2009). Our discussion of Utility computing begins with this concept of Grids as a foundation. As with the other concepts however for Grids hyperbole around the concept abounds, with arguments proposed that they are "the next generation of the internet", "the next big thing"; or that will "overturn strategic and operating assumptions, alter industrial economics, upset markets (...) pose daunting challenges for every user and vendor" (Carr 2005) and even "provide the electronic foundation for a global society in business, government, research, science and entertainment" (Berman, Fox et al. 2003). Equally, Grids have been accused of faddishness and that "there is nothing new" in comparison to older ideas, or that the term is used simply to attract funding or to sell a product with little reference to computational Grids as they were originally conceived (Sottrup and Peterson 2005).

From a technologists perspective an overall description might be that Grid technology aims to provide utility computing as a transparent, seamless and dynamic delivery of computing and data resources when needed, in a similar way to the electricity power Grid (Chetty and Buyya 2002; Smarr 2004). Indeed the word grid is directly taken from the idea of an electricity grid, a utility delivering power as and when needed. To provide that power on demand a Grid is built (held together) by a set of standards (protocols) specifying the control of such distributed resources. These standards are embedded in the Grid middleware, the software which powers the Grid. In a similar way to how Internet Protocols such as FTP and HTTP enable information to be past through the internet and displayed on users PCs, so Grid protocols enable the integration of resources such as sensors, data-storage, computing processors etc (Wladawsky-Berget 2004).

The idea of the Grid is usually traced back to the mid 1990s and the I-Way project to link together a number of US supercomputers as a 'metacomputer' (Abbas, 2004). This was led by Ian Foster of the University of Chicago and Argonne National Laboratory. Foster and Carl Kesslemenn then the Globus project to develop the tools and middle ware for this metacomputer[3]. This tool kit rapidly took off in the world of supercomputing and Foster remains a prominent proponent of the Grid. According to Foster and Kesselman's (1998) "bible of the grid" a computational Grid is "a hardware and software infrastructure that provides dependable, consistent, pervasive and inexpensive access to high-end computational capabilities". In this Foster highlights "high-end" in order to focus attention on Grids as supercomputing resource supporting large scale science; "Grid technologies seek to make this possible, by providing the protocols, services and software development kits needed to enable flexible, controlled resource sharing on a large scale" (Foster 2000).

Three years after their first book however the same authors shift their focus, again speaking of Grids as "coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organizations" (Foster, Kesselman et al. 2001). The inclusion of "multi-institutional" within this 2001 definition highlights the scope of the concept as envisaged by these key Grid proponents, with Berman (2003) further adding that Grids enable resource sharing "on a global scale". Such definitions, and the concrete research projects that underlie them, make the commercial usage of the Grid seem hollow and opportunistic. These authors seem critical of the contemporaneous re-badging by IT companies of existing computer-clusters and databases as "Grid enabled" [5](Goyal and Lawande 2006; Plaszczak and Wellner 2007). This critique seems to run through the development of Grids within supercomputing research and science where many lament the use of the term by IT companies marketing clusters of computers in one location.

In 2002 Foster provides a three point checklist to assess a Grid (Foster 2002). A Grid 1) coordinates resources that are NOT subject to centralized control; 2) uses standard, open, general purpose protocols and interfaces; 3) delivers non-trivial qualities of service. Fosters highlighting of 'NOT', and the inclusion of 'open protocols' appear as a further challenge to the commercialization of centralized, closed grids. While this checkpoint was readily accepted by the academic community and is widely cited, unsurprisingly, it was not well received by the commercial Grid community (Plaszczak and Wellner 2007). The demand for "decentralization" was seen as uncompromising and excluded "practically all known 'grid' systems in operation in industry" (Plaszczak and Wellner 2007, p57). It is perhaps in response to this definition that the notion of "Enterprise Grids" (Goyal and Lawande 2006) emerged as a form of Grid operating within an organisation, though possibly employing resources across multiple corporate locations employing differing technology. It might ultimately be part of the reason why "Cloud computing" has eclipsed Grid computing as a concept. The commercial usage of Grid terms such as “Enterprise Grid Computing” highlights the use of Grids away from the perceived risk of globally distributed Grids and is the foundation of modern Cloud Computing providers (e.g Amazon S3). The focus is not to achieve increased computing power through connecting distributed clusters of machines, but as a solution to the “Silos of applications and IT systems infrastructure” within an organisation’s IT function (Goyal and Lawande 2006, p4) through a focus on utility computing and reduced complexity. Indeed in contrast to most academic Grids such “Enterprise Grids” demand homogeneity of resources and centralization within Grids as essential components. It is these Grids which form the backdrop for Cloud Computing and ultimately utility computing in which cloud provider essentially maintain a homogenous server-farm providing virtualized cloud service. In such cases the Grid is far from distributed, rather existing as “a centralized pool of resources to provide dedicated support for virtualized architecture” (Plaszczak and Wellner 2007,p174) often within data-centers.

II. CONCLUSION

There are currently a large number of projects and a diverse range of new and emerging Grid developmental approaches being pursued. These systems range from Grid frameworks to application testbeds, and from collaborative environments to batch submission mechanisms.

It is difficult to predict the future in a field such as information technology where the technological advances are moving very rapidly. Hence, it is not an easy task to forecast what will become the ‘dominant’ Grid approach. Windows of opportunity for ideas and products seem to open and close in the ‘blink of an eye’. However, some trends are evident. One of those is growing interest in the use of Java and Web services for network computing.

The Java programming language successfully addresses several key issues that accelerate the development of Grid environments, such as heterogeneity and security. It also removes the need to install programs remotely; the minimum execution environment is a Java-enabled Web browser. Java, with its related technologies and growing repository of tools and utilities, is having a huge impact on the growth and development of Grid environments. From a relatively slow start, the developments in Grid computing are accelerating fast with the advent of these new and emerging technologies. It is very hard to ignore the presence of the Common Object Request Broker Architecture (CORBA) in the background. We believe that frameworks incorporating CORBA services will be very influential on the design of future Grid environments.

The two other emerging Java technologies for Grid and P2P computing are Jini and JXTA . The Jini architecture exemplifies a network-centric service-based approach to computer systems.

Jini replaces the notions of peripherals, devices, and applications with that of network-available services. Jini helps break down the conventional view of what a computer is, while including new classes of services that work together in a federated architecture. The ability to move code from the server to its client is the core difference between the Jini environment and other distributed systems, such as CORBA and the Distributed Common Object Model (DCOM).

Whatever the technology or computing infrastructure that becomes predominant or most popular, it can be guaranteed that at some stage in the future its star will wane. Historically, in the field of computer research and development, this fact can be repeatedly observed. The lesson from this observation must therefore be drawn that, in the long term, backing only one technology can be an expensive mistake. The framework that provides a Grid environment must be adaptable, malleable, and extensible. As technology and fashions change it is crucial that Grid environments evolve with them.

Smarr observes that Grid computing has serious social consequences and is going to have as revolutionary an effect as railroads did in the American Midwest in the early 19th century. Instead of a 30–40 year lead-time to see its effects, however, its impact is going to be much faster. Smarr concludes by noting that the effects of Grids are going to change the world so quickly that mankind will struggle to react and change in the face of the challenges and issues they present. Therefore, at some stage in the future, our computing needs will be satisfied in the same pervasive and ubiquitous manner that we use the electricity power grid. The analogies with the generation and delivery of electricity are hard to ignore, and the implications are enormous. In fact, the Grid is analogous to the electricity (power) Grid and the vision is to offer (almost) dependable, consistent, pervasive, and inexpensive access to resources irrespective of their location for physical existence and their location for access.

This Project has enabled us to visualize a system that proves to be more accurate in Searching and Extracting Images from databases. Unlike the conventional search methods this technique has enabled us to achieve accuracy in data mining techniques and a feedback system that enables users to get a panoramic view of how and why the specific results were achieved thus making this system more reliable with transparent operations. This project's implementation in the real will help us to find the image more faster in the image database in effective way as well as by extracting the features it will be easy to display the results according to human expectations which was given as the input query.

REFERENCES

1. Berman, F. and T. Hey (2004). The Scientific Imperative. The Grid 2. I. Foster and C. Kesselman. San Francisco, Morgan Kaufmann.

2. Grid Computing: Making The Global Infrastructure a Reality by Fran Berman (Editor), Geoffrey Fox (Editor), Anthony J.G. Hey (Editor), John Wiley & Sons; (April 8, 2003), ISBN 047085319

3. Blueprint for a New Computing Infrastructure by Ian Foster and Carl Kesselman, Morgan Kaufmann Nov 2003, ISBN: 1558609334.

4. Goyal, B. and S. Lawande (2006). Grid Revolution: An Introduction to Enterprise Grid Computing. New York, McGraw-Hill Osborne.

5. Agustin C, Omer R, Maria C, Carmen C(2007) An Autonomic Network-Aware Scheduling Architecture for Grid Computing pp. 444 - 458.

6. Xiyan L, Runtong Z(2005) Grid: The Future of the Internet.