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A SURVEY ON CURRENT TRENDS AND GRID COMPUTING

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Abstract- After 1990's there is a huge change in the world of computing. The concept of parallel computing is a combination of hardware and software which allows flexibility and seamless service oriented network. This computing allows sharing of resources from distributed and diverse locations. Grid computing systems are complex and dynamic. Grid has appeared as a new approach to high performance distributed computing infrastructure. Grid has identified a new way of managing and organizing computer networks. It's mainly for resource sharing. The aim of grid computing approach is to larger scale computation. The geographically distributed computational resources are collaborated with a grid view as a virtual computer. This paper presents the various types of grid, grid architecture load balancing, fault tolerance and challenges in grid computing.

Keywords: Grid computing, Virtualization, Resource sharing, Load balancing, Parallel computing, Distributed computing.

Introduction

Grid computing came in a mid- 1990's with a goal to provide an opportunity to the user to remotely utilize ideal computing power within other computing[3]. A few years ago for accessing the information and resource user required huge data storage devices. For Computational Grid is a combination of hardware and software that provides high speed and high end computational facilities. Grid computing was introduced in 1970 by Ianfoster and Kesselman. the concept of Grid computing arise in the early 1990's as a Metaphor for making computer power as easy to access an electric power grid. A computational Grid is a collection of heterogeneous computer resources spread across geographical boundaries. CPU scavenging and volunteer become popular in 1997 by distributed.net and later in 1991by SETI@home to apply the power networked PC's world wide, in order to solve CPU intensive problems [Berman,et al, 2003]. The grid computing brain child of Ianfoster, Carl kesselman, Steve Tuecke published a seminal work " The Grid blueprint for new computing infrastructure". Their efforts created a

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GTK (Globus Tool Kit) which contained storage management, computational management, security management, monitoring and related services. They were widely honored as the "Father of Grid". Grid is a virtual organization compose several independent autonomous domains. Grid computing enables peoples to be members of many (VOs) which given one access to various computational, instrument-based data and other types of resources. Grid computing enables multiple applications to share computing infrastructure, flexibility, scalability, cost, power efficiency, performance and availability at the same time. Grid computing is now increasingly essentially main stream of technology for a wide range of critical application. These high performance computing are being extensively used by various area's like business, education, science and government etc. The LHC's computing Grid is a world record holder. WLCG was also the world's largest distributed computing grid ,comprising over 170 computing centers in 42 countries, Some domains of Grid computing are high energy, physics, chemistry, biology, earth science, astrophysics, fusion, computational chemistry etc., The characteristics of computational Grid are scalability, heterogeneity, security and fault tolerance that are necessary for the Grid user level, middle ware and source level.

GRID ARCHITECTURE

The Grid infrastructure forms a core foundation for successful Grid applications. The grid infrastructure allows number of capabilities and resources for specific problems. Grid application infrastructure delivers the service heeders and developers and providers support required for the environment. Our Goal is IOT provide complete enumeration of all protocol services and general classes of component which can be placed under virtual organization requirements. Our goal is describing our grid architecture is not to provide a complete enumeration of all required protocols and services, APIs, and SDKs but averagely identify requirements for general classes of component. Illustrate the layered grid architecture and its relationship to the internet protocol architecture.

Application layer: These user application, which performed by using the service defined at each lower level layer. At each layer, we have well defined protocols that provide some useful service data access, resource discovery, resource management.

Resource layer: It is responsible for all global resource management and interaction. Control the initiation, secure negotiation, metering, monitoring, payment and account involving sharing across individual resources.

Connectivity layer: it defines the core communication and authentication protocols require for grid specific network transaction.

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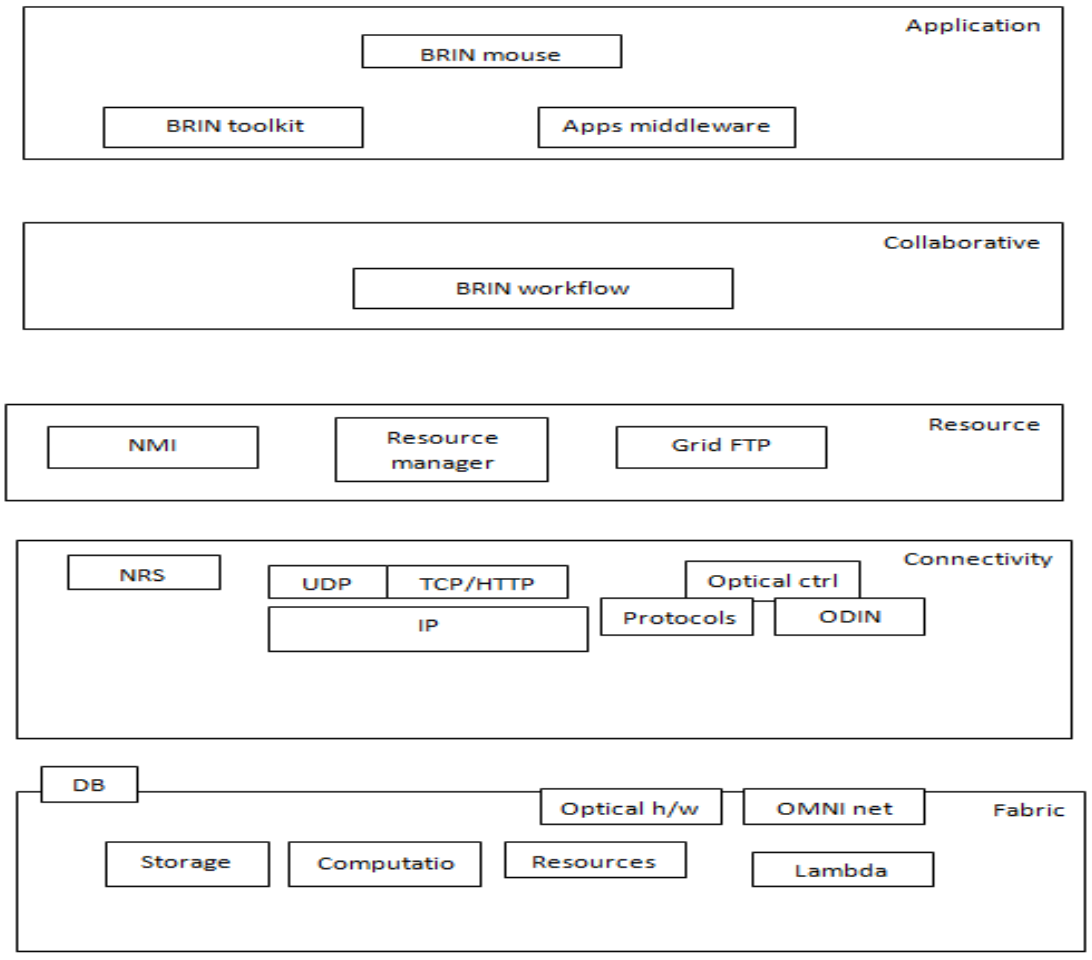
Fabric layer: it defines the resources which are sharable. A "resource" may be logical entity, computer clusters, such as a distributed file system, or distributed pool.

Layered Architecture



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REVIEW OF LITERATURE

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

Thangamani et al., [4] discussed about pervasive semantic Grid computing in hospital scenario used for IOT standards pervasive any where of computing technology in digital world of Grid couples in our physical world. Both Grid and pervasive computing are large number in distributed processing. Grid computing in collaborative element and pervasive processing higher volumes of data. This combination would be lead to (ambition intelligence) semantic Grid in physical world.

Semma Kumari and Gulshnan Kumar[5] discussed that job scheduling algorithm in Grid computing which distributes the task to a group of network where computer are linked together to provide a better computational resource. The use of the scheduling is to increase the throughput , efficiency, decrease the running time. They have proposed researchers to carry out the future work in that area and develop a better algorithm.

Abdulghani suwan et al., [6] analyzed the security policies in Grid computing. This research community has addressed this requirement with a number of monitoring networks. These existing solutions give the idea of implement little support for collecting enforcing security policies and security related data and constrained in this respect. From this survey suggested grid monitoring frame work are incapable of collecting security-related data metrics.

Vijay Kaushik et al., [7] described A mobile ad-hoc network (MANET) is an autonomous collection of mobiles users that communicate over relatively bandwidth constrained wireless links. This paper proposed scalability and analysis of Grid computing though using ad-hoc in different types of protocols and security checks measures in MANET. The MANET applications such as battlefield and rescue operations, which tends to have contradicting needs.

Prof. sachin B. Jadav et al., [8] describes the dynamic load balancing using simulation in Grid computing technology can be seen as a positive alternative for implementing high performance distributed computing. They focused the main aim of load balancing is to provide a distributed, low cost scheme that balances the load across all the processors. in this paper proposed in a simulated grid environment Which fulfills the objective to achieve high performance of computing by optimal

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usage of geographically distributed and heterogeneous resources in grid environment.

S.Saravanan et al., [9] had proposed Http protocol between PC and telemedicine server. Even if some from encryption is used in transit, the medical data usually reside in an unencrypted format on the enrolled PC. Grid computing based RSA security in telemedicine center is one of the most important issues facing big data for patient results. This paper proposed the grid is reliability and RSA security in grid computing.

Amarbirsing et al., [10] had proposed Grid computing an advanced analysis on grid computing security threats. Grid computing is distributed computing and high end computing or supercomputing capacity by sharing the resource of computer over network. A grid can face security hazards due to defenselessness ,security, getting hit directed by hackers, security branches. This paper analyzed the complete analyze of various threats to grid and possible solution of it.

Chenxiao et al., [11] proposed Grid based open government Data mining. The open government Data movement increased recent years the data has become an very important part of big data. This paper proposed a spatial Grid based approach to managed government data and mine hidden information from it. Such data organization can facilitated the usage of array database technologies, which further introduce high performance in database computing for data analysis.

R.C.Joshi et al., [12] reviewed the "A survey on issues in mobile Grid computing ", The scope of grid computing broadens the scope of grid computing by vast resource pool available in the form of mobile devices. This paper survived the paradigm of mobile grid computing and futures in the grid computing environment. We also discussed various challenges the paradigm faces of the feature of mobility in the grid computing environment.

Dr.Gurvinder singh bajwa et al., [13] had proposed the load balancing in Grid computing used ANT COLONY optimization is a swarm intelligence technique which inspired from the Foraging behavior of real ant colonies. This ACO exploits optimization mechanism for solving discrete optimization problems in various Engineering domains, travelling salesmen problem, network routing and scheduling.

Tianweini et al., [14] had proposed an improved job scheduling algorithm based on the first distribution and Redistribution strategy for grid computing . As the traditional job scheduling algorithm ignore the impact of resource fragmentation, in terms of execution time of Grid computing. From this algorithm consider the resource recycling so specifically and distribute the job efficiently.

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Minakshi Memoria et al., [15] had proposed the fault tolerance in Grid computing with improve resource utilization of maximum efficiency. From this paper gives a method to improve the resource utilization with maximum efficiency of fault in system. It contains three phases resource allocation, job analysis, job execution phase it also increase the though put of system by check pointing and execution job are reducing the time.

Majid Sina et al., [16] had proposed the application of cukoo algorithm to developed using in Grid computing. This article cukoo algorithm to improve the economic scheduling in Grid computing. different economic calculation method is evaluated given the time and cost criteria. This paper proposed increase the speed to achieve optimal value and the higher repetition will reduce the time

Vishalan chan et al.,[17] had though an Ad-hoc proposed Grid computing in smart phones the overall speed of execution of a task, which is considerably reduce due to the typical limitation of mobile devices. This paper proposed a system that uses the popular OS ”android” which is based on the Linux platform and proved the facts.

Rishabhrai et al., [18] had proposed the Data Management and heterogeneous data integration in grid environments. Computational grids, have emerged as popular platform for deploying large-scale applications. define enables of distributed heterogeneous resource popular platform large scale applications. This paper proposed interest to distributed computing researchers because grid computing new challenges that needed to be addressed.

El sayed oarabi et al.,[19] had proposed DNA is a molecular that encodes unique genetic instructions used in the development and the functioning of all know living organism and viruses. Smith water man algorithm, some weighting metrics and a grid of computers are used to find DNA datasets.

Jay Patel et al.,[20] proposed to provide security mainly authentication and authorization to given to the system. For that purpose Mostly Textual passwords are being used. Now a days geographical password also available. But most of the graphical scheme are vulnerable to shoulder surfing. This paper proposed the study of the available authentication schemes for session passwords.

ISSUES AND CHALLENGES

The most important challenge in grid is handle different present in the infrastructure. Complexity arises because of the decentralized control. programming in grid computing environment introduce new challenges that not faced in parallel and cluster computers, such as different administrative domains, large variations and new failures in performance. grid computing underlying hardware and software resources. Grid also arises

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to deal with faults in grid, security mechanism, grid middle ware such as resource broker, local polices and usage pattern resources and so on.

COMPARISON OF CLUSTER AND GRID COMPUTING TECHNOLOGIES

Features	Cluster computing	Grid computing
Goal	Improving performance and high availability	Collaborative sharing of resource
Principal	Processing specific application	Needs processing from you
Level of abstraction	Low	Low
Degree of scalability	Low	Normal
Transparency	Low	Low
Time to run	Not real time	Not real time
Security	High	Low
Ownership	Single	Multiple
Resource sharing	Centralized	Collaborative
Uses	Computing	Storage platform
Highlevel services	Limited	Plenty
Standardization	VIA	Standardization and interoperability
Example of real world	Google, protein explorer, earthquake simulation	SETI,BONIC,GIMPS
Type of service	CPU	CPU,

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		network,memory,device,storage,bandwidth
Resource management	Centralized	Distributed
Allocation scheduling	Centralized	Decentralized
Dependency	Behaves like a single system	Cloud or part of a cloud
Request type		Large allocation
Operating system	Standard OS	Any OS
User friendly	Moderate	Low
Number of users	Few	Few
Response time	Real time	Scheduled
Pricing of service	Not open for market	Public or privately assigned
Data intensive storage	Suited for that	Suited for that
Configuration	Easy	Difficult
Future	Grid computing	Cloud computing
Heterogeneous/homogenous	Homogeneous	Heterogeneous
Distributing	LAN	LAN or MAN
Job processing	Centralized	Decentralized
Failure management	Strong	Limited
Coupling	Tightly coupled	Loosely coupled

CONCLUSION

In this paper we studied grid infrastructure and current trends in grid computing and features of grid computing. Grid computing has emerged as a powerful tool for enhancing computer power. This technology uses in super computer in idle capabilities can be perform calculations and activities. Grid computing has been briefly

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explained here. The object of paper is clear survey in grid computing.

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