A Detailed Estimates on Grid Computing And Its Applications

Rajashri.S.Shekokare[1], Dr.Rais Abdul Hamid Khan[2], Mohad Muqeem[3], Dr.Pawan Baldhare[4]

[1]MTech ,IV Semester appearing, Associate professor.KCE'SCOEM, Jalgaon, India, 425001,
[2]Professor,CSE Department,SOCSE,Sandip University,Nashik 422001 ,Maharashtra,India.
[3]Professor,CSE Department,SOCSE,Sandip University,Nashik 422001,Maharashtra,India.
[4]HOD CSE Department,SOCSE,Sandip University,Nashik 422001,Maharashtra,India.

Shekokarerajashri@gmail.com,
rais.khan@sandipuniversity.edu.in
Muqeem.79@gmail.com
Pawan.baladhare@sandipuniversity.edu.in

Abstract – *Grid Computing defined as a network Computers working together to perform a particular task that would be different for a single machine . All machines over network works under similar protocol to act as a Virtual Super Computer . Task that can include analyzing Huge datasets or Simulating Situations that require High Computing Power. This Paper Mainly Focus on Grid Computing , basic features , difference Between Cloud Computing And Grid Computing ,Cluster Computing , Distributed Computing also highlights various applications of grid computing.*

Keywords- *Grid Computing, Cloud, Cluster.*

I. INTRODUCTION

Grid Computing forms a Single Unified Infrastructure by Connecting Disparate Computers .Grid Computing Relies On Software (Middleware) that directs and divides pieces of program as a one large image to different Number of Different Computers[1].Different Organization uses grid computing to perform big task and solve Complex Problem Which are very difficult to Solve on a Single Computers .For Example Grid Computing Use by Metrologies for weather Modeling .Weather Modeling requires Complex data Management and analysis Massive Amounts of Weather Data Processing on Single Computer is Slow and Time Consuming task . Because of that Metrologies run the analysis over geographically disparate grid computing infrastructure and Combine results[Amazon AWS].

II. LITERATURE REVIEW

In This Paper, We Proposed a Grid Computing using compact Computer network . Generally , Embedded Compact Computers Executes Their assigned processes.

A well Known Example of Grid Computing in Public Domain is the Ongoing SETI (Search for Extra Terrestrial Intelligence)@ Home Project in that thousands of people shares used processor cycles of their PCs in vast search for signs of "rational" signals from outer space[Grid Computing Overview] .

Grid Computing use in variety of ways to address different kinds of application requirements. Three

International Journal of Innovations in Engineering and Science, www.ijies.net

Primary Types of Grid Computing are Summarized as Below [7]

1. Computational GRID: Computational Grid Provides high Performance Computers .It allow Researchers to use Computing Power of the Computing to perform Complex task such as mathematical simulations.
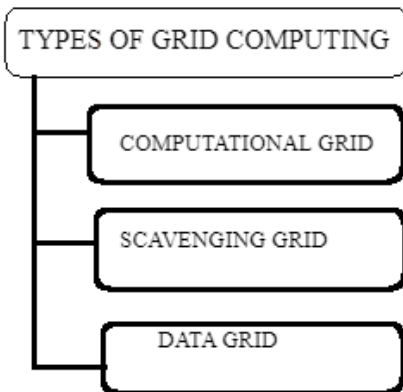

Fig 1 : Types of Grid Computing

2. SCAVENGING GRID:

CP Scavenging Grid Have many regular Computers .The Scavenging Grid Also known as CPU Scavenging or Cycle Scavenging .

3. DATA GRID :

Data Grid refer to grids which splits data on multiple Computers Users are not Concerned Where this Data is Actually located still they can access data Successfully. For Example, Two University doing Life Science Research, each with unique type of data .

A Data Grid allow them to Share their data, manage data and to manage Security issues such as who has access to What Data.
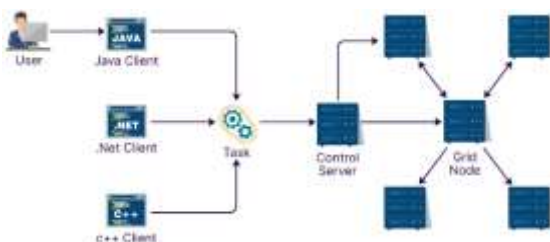
GRID COMPUTING WORKING

Fig 2 : Grid Computing Working

A Grid Computing Network Mainly Consists of three Types of Machines.

1. CONTROL NODE :

A Server, Usually a Computers or a Group of Servers Administrate Whole Network And Keep Resources Account in the network Pool.

2. PROVIDER :

The Computers Share Their Resources to the Network Resource Pool.

3.USER:

The Computers Use Resources on Network.When a Computer makes a request for recourses to Control Node , Control Node Gives user access to resources available to network . Hence normal Computer on Node Swing in Between User or a Provider Based On Its Needs.

Hydrogenous Network are those who Consist of Machines With Similar Platforms by using Same Operating Systems. While Hydrogenous Machines are those having different platform running on various different Operating Systems .

This is Major Difference of Grid Computing from other Distributed Computing Architectures.
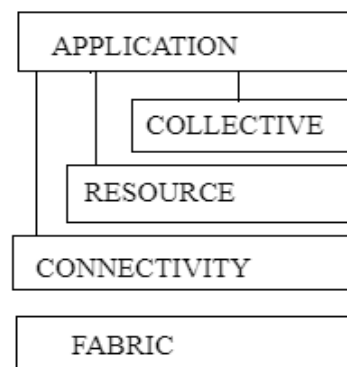
LAYERED ARCHITECTURE OF GRID COMPUTING

Fig   3 : Grid Layered Architecture

1. The Fabric Layer:

The Fabric Layer Includes Physical Resources which are Shared Inside the Grid . This made up of Network resources , Storage System ,Computational Resources ,

International Journal of Innovations in Engineering and Science, www.ijies.net

Software Modules ,Sensors, Additional System Resources.

2. Connectivity Layer:

The Connectivity Layer Provides the Switch of Data Among Fabric Layer Resourses. Significant Functionality at Connectivity Layer Comprise

Identification , Navigation, Transfer, Support for Safe Conversation.

3. Resource Layer:

The Resource Layer Provides Interaction activity and Protection as Distinguished b Connectivity layer. It is used for many applications such as Scrutinizing accounting , Computes Whole Expenses for Individuals Resources . etc and Compute Whole Expenses For Using Individual Resources.

4. Collective Layer:

The Collectivity Layer Used for World Wide Recourses management and interaction with the Collection of resources. Important Facility Provided by this Layer are Directory Services , Co-allotment , Scrutinizing Investigate Service , Collaborative and data Elicitation Services.

5. Application Layer:

The application Layer involves user applications which are installed on Grid.

It is Significant to Observe that no user application can be installed on Grid , Just a grid permitted or gratified application . It is an application Which uses various processes of a Grid Settings or Which may be Implemented on Various Machines.

How Grid Computing Works

A user submit a Computational task or a job to Grid Network Through Control Node . The Task Can Be A Complex Calculation , Data Analysis , Simulation or other intensive work.

The Control Node Receive task From User and Submit it into Number of Smaller Sub Tasks. The Control Node assign each subtask to different provider node within grid network. Provider Node Receives Subtask and Execute it in parallel.During Execution Phase Provider Nodes Communicates with One Another.

During This Communication Enable to Share information about Progress of subtask , exchange of data or synchronize their activities .

Control Node Collect And Aggregates results to obtain Final Output Of Main Task.

III - GRID SECURITY CHALLENGES

Control Policies are Provided by Multiple Recourses to the Third Party .The Virtual Organization Coordinates resources sharing and use.

➢ **SINGLE SIGN-ON:** Identity based authentication is necessary in most distributed System and Authorization Control. For Login Purpose User Have given username and password for accessing computing system. In Grid Environment Users or their agents need to access multiple resources from different domains that have different security mechanism.
Single sign-on user should able to authenticate once , release resources, Communicate internally without any further authentication .

➢ **PROTECTION OF CREDENTIALS:** Passwords, Private Keys , etc should be Protected.

➢ **DYNAMIC CREATION OF SERVICES:** Users must be able to create services dynamic without administrator permission .
These resources should coordinate and interact with other resources so we must able to name services with acceptance identity and able to grant Rights to that Identity Without any Coordination with Governing Legal Policies.

IV- FEW OF THE APPLICATIONS OF GRID COMPUTING

1. The Australian Virtual Observatory (Aus- VO):
   It make easy & provides a distributed, uniform interface to the data archives of Australia's major astronomical examinations and to archives of astrophysical simulations .which gives facility which willconnect the archives of the world's major astronomical

2. Search for Extra Terrestrial Intelligence (SETI): It is One of the Very Good applications of radio astronomy is the examination of radio signals as part of Searches for Extra Terrestrial Intelligence [10].

International Journal of Innovations in Engineering and Science, www.ijies.net

3. ***Earth System Grid (ESG):*** It help for producing, archiving, and providing access to climate data that advances our understanding of global climate change. ESG uses Globus software for security, data movement, and system monitoring [11].

4. observatories into one distributeddatabase [12]

V. ADVANTAGES OF GRID COMPUTING

1. Grid Computing Provide transparent access to remote resources
2. Grid Computing Allow on-demand aggregation of resources at multiple sites.
3. Grid Computing Reduce execution time for large-scale, data processing applications.
4. Grid Computing Provide access to remote databases and software Take advantage of time zone and random diversity. (in peak hours, users can access resources in off-peak zones).

VI. CONCLUSION

In summary of this paper , Grid computing is a collaboration of different computers, for a specific task, so that the user acquires better evaluation for that specific task. The Grid aim to turn the global network of computers into one big Computational l resource**.** Grid computing is   service oriented than application oriented. Grids are a form of distributed computing whereby a "super virtual   computer" is composed of number of networked loosely coupled computers acting together to perform large tasks. The importance of grid computing can be clearly observed by its applications in various fields including biology, medicine,   earth   sciences,   physics,   astronomy, chemistry, and mathematics etc.

REFERENCES

[1] *http://ccskguide.org/wpcontent/uploads/2011/01/c c skguide_lightword_headertrans.png*

[2] *http://googleads.g.doubleclick.net/pagead/html/r2 0 130319/r20130206/zrt_lookup.html.*

[3] *http://www.svce.ac.in/departments/ca/Digit14/grid . html*

[4] *Muhammad Naqaash, M. Aqeel Iqbal, Qaisar Pervaiz, Omer Shamim, Syed Aqeel Hussain, "GridComputing Used For Next Generation High Speed Processing Technology", International Journal on Computer Science and Engineering Vol. 02, No.05, 2010, pp.1926-1933.*

[5] *Reality Grid, Engineering & Physical Sciences Research Council, UK 2001 http://www.realitygrid.org/information.html.*

[6] *www.informatica.com/solutions/resource_center/g l ossary/default.htm.*

[7] *BartJacob (bjacob@us.ibm.com), ITSO Redbooks Project Leader, IBM June 2003.*

[8] *http://www.researchgate.net/post/What_are_the_d ifferences_between_grid_computing_and_cloud_c o mputing.*

[9] *www.jatit.org/research/introduction_grid_computi n g.htm*

[10] *http://blog.protogenist.com/p=441*

[11] *Elias Kourpas, "Grid Computing: Past, Present, andFuture", June 2006.*

[12] *http://www.aus-vo.org*

[13] *http://www.neesgrid.org*

[14] *http://www.cloudbus.org/neurogrid/*

[15] *http://www.cloudbus.org/vlab/*

[16] *Hai Zhuge, "China's E-Science Knowledge Grid Environment", Chinese Academy of Sciences, Institution of Engineering & Technology, 2009.*

[17] *Naidila Sadashiv, S M Dilip Kumar, "Cluster, Grid and Cloud Computing: A Detailed Comparison" in 6th International Conference on Computer Science & Education (ICCSE), August 3-5 2011.Superstar Vigro, Singapore.*

[18] *G.A.Taylor.M.R Irving P.R Hobson .C.Huang P. kyberd, R.J. Taylor , " Distributed Monitoring and Control of Future Power System , IEEE Paper 2006.*

[19] *M.Ali, Z.Y.Dong.P.Zhang "Adoptibility of Grid Computing Technology in Power System Analysis ,operation and control". IET Generation , Transmission, And Distribution , February 2009.*

[20] *Tapas Samanta, gaurav saxsena ,P.C.Chakraborty,C.D.DATTA d.Ssarkar,"Computing Grid at VECC, Kolkata", Computer & Informatics Groupp, Variable Energy Cyclitron.*

[21] *EU-India Grid Project www.euindiagrid.eu*