CHAPTER 1

Introduction

In recent past years, grid computing find to very important topic for research. Grid computing is combination of different types of resources that can provide the contribution from the different domains to reach at the common objective or to solve the same problem. Das and Sarkar (2012) says Grid system can be well compared with the power grid system where the user is getting the power for their own use but no one knows from where the power is coming & don’t know the physical location of power generation, in the same sence in grid computing the user is using the power from any kind of resource disk drives, mass storage, printers, memory & processing power but not aware the source of power that is providing by different types of resource to solve the same problem in grid system.

Grid system can be classified to various types.

Data grid system can be defined as structure or group of services the provide the data access to single user or multiple users according to the requirement of the user. Data may hosted on single site multiple site where each site from different administrative domain with their different security aspects to give the authentication and authorization to the different kinds of users to access the data. In the data grid system data may be replicated, it is necessary to maintain the consistency in between the data & the related replica. Any change in the main copy should be reflected in the replica side by side.

Service Grid can be defined in the manner used for the systems that provide service that is not given by single resource this category can divided in On Demand, Collaborative and Multimedia Grid Systems. A computational grid is a hardware and software infrastructure that provides dependable, consistent, pervasive, and inexpensive access to high-end computational capabilities. In the grid computing world computational grid is very important because it provide the high level computational power by using the many resources to solve a common problem at high computational speed i.e. high will be the computational power, less will be the execution time for the programme or problem. It provides a virtual platform to solve many problems by integrating computational capabilities. Today available computers are more powerful. Nowadays personal computers are much powerful as compare to the computers of past years, the main problem is that most of computational power wasted due to not use of the machines or computers...
in a specific time. Desktop computational grid solve this problem by provide a platform to use the unused computational power to solve a problem at high speed. The Desktop grid provide power at low cost because if the infrastructure is available in a specific time then the computational power can be used at any time for solve a problem.

Das and Sarkar (2012) Says that Faults and Failures are very common in the grid computing, it can occur in any type of grid which can affect the grid processes, grid power at any level depends on the failure or problem happens in running grid. The major challenge is the dynamic nature of the resource available in the grid, many numbers of resources contribute in the desktop computational grid, Any failure, fault, error can effect the running grid or processes at any level .so it is very necessary to address these types of the problems. Many types of failures or faults or errors find in the desktop grid at any level .some of them are categorized

1. Fault at Machine level- This type of problem can be occur due to failure of machine or the problem in the operating system installed in the respective machine or resource.
2. Fault at Physical level – This type of failure can be happen due to problem in memory or processor, or problem in the corrupted storage.
3. Faults at user level- These type of problem can be created by the user by pressing some unwanted keys or commands that can effect the running grid at any level
4. Faults at network level problem- As we know grid is based on the connected resources on the network, and depends on the network .any type of the network related problem can damage the grid at any time at any level.
5. Faults due to service termination- This type of fault can affect the grid due to service termination of the resource that is using by the running grid but resource not in condition to use.
6. Faults at process level –These types of fault or failures can be happen due to non availability of resource, any type of problem in the middle ware.
Research Motivation

Versweyveld Leslie (2011) of the International Desktop Grid Federation (IDGF) said that we have the lots of unused computational power in the education institutes, universities, Home, offices that can be utilized for solve the problem .but there is need to integrate the available power in the proper way and apply that power to use for solve the many kinds of scientific problems.Computional desktop grid is the platform which is used to collect the unused computational power from the different available resources.

As the above we discussed the lots of faults ,failures in the grid .so the any fault can put impact on running grid at any level .some types of faults can effect the grid lightly, some faults can fully stop the running grid. It is very necessary to handle these types of situations in the desktop computational running grid. Desktop grid is mainly based on the main node & rest of the executing nodes that is used to execute the process the fault & failure can put impact on the main node as well as the executing node in the running grid. As we Refer the past research work address problem by providing methods to save the grid by providing replication, use of checkpoint algorithm, agent based migration etc.All the solutions are good at save the data & jobs .but no research provide the working frame work or algorithm to support the running computational grid as system software .In this research work we strongly recommend that there is need system software based framework or model to handle the different types of faults or failures in the running grid. The most important factor in the desktop computational grid is the computational power. Whole performace of the desktop computational grid is based on the available computational power, Different types of fault or failures can effect the computational power of the running desktop grid which will decrease the power of whole grid which directly hit the performance of the running grid In this research work we recommend the need of development of the software based framework to provide the availability of the computational Power. These types of frame work can helpful to support the running grid & to support the computational power suffered from the faults and failures in the grid.