An Efficient Distributed for Grid Resource with PH-PSO

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Abstract--- *Grid computing is a term referring to the combination of computer resources from multiple administrative domains 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. There are mainly two mechanisms for acquiring information of grid resources: grid resource monitoring and grid resource prediction. Timely acquiring resource status information is of great importance in ensuring overall performance of grid computing. This work aims at building a distributed system for grid resource monitoring and prediction. We present the design and evaluation of system architecture for grid resource monitoring and prediction. We discuss the key issues for system implementation, including machine learning-based methodologies for modeling and optimization of resource prediction models. Evaluations are performed on a prototype system. Our experimental results indicate that the efficiency and accuracy of our system meet the demand of online system for grid resource monitoring and prediction.*

Keywords--- *Grid Resource, PH-PSO, Efficient Distributed, (GridRM).*

I. Introduction

1.1. Grid Computing

A Grid is a very large scale, generalized distributed NC system that can scale to Internet-size environments with machines distributed across multiple organizations and administrative domains. The emergence of a variety of new applications demand that Grids support efficient data and resource management mechanisms.

For a Grid to efficiently support a variety of applications, the resource management system (RMS) that is central to its operation must address the above issues in addition to issues such as fault tolerance and stability.

The RMS manages the pool of resources that are available to the Grid, i.e. the scheduling of processors, network bandwidth, and disk storage. In a Grid, the pool can include resources from different providers thus requiring the RMS to hold the trust of all resource providers.

1.2. Grid Resource Monitoring

The Grid Resource Monitoring (GridRM) project's focus is to provide a generic open source resource monitoring architecture, designed specifically for the Grid. Unlike many other monitoring systems, GridRM is designed to monitor Grid resources, rather than the applications that execute on a Grid. The Grid RM is capable of registering

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interest in events, remotely observing devices, as well as gathering and displaying monitoring data.

1.3. Grid Services and Resources

Grid services and resources are registered within one or more Grid Information Servers (GISs). The end users submit their requests to the Grid Resource Broker (GRB). Different requests demand different requirements and available resources have different capabilities.GRB discovers proper resources for executing these requests by querying in GIS and then schedules them on the discovered resources. Until now a lot of works has been done in order to schedule jobs in a computational grid. Yet according to the new nature of the subject further research is required used agents to schedule grid.

1.4. Objectives

Our work is building a distributed system for grid resource monitoring and prediction. Resource allocation and job scheduling in grid computing is major issue. Grid resource monitoring is based on machine learning prediction. The goal of designing a grid resource monitoring and prediction system is to achieve seamless fusion between grid technologies and efficient resource monitoring and prediction strategies.

II. PROBLEM DEFINITION

Resource monitoring can only support instantaneous resource information acquisition. It cannot generalize the dynamic variation of resources. Resource state prediction is used to find dynamic variation. Grid resource state prediction focuses on the variation trend and running track of resources in a grid system by means of modeling and analyzing historical monitoring data. Historical information generated by monitoring and future variation generated by prediction. In optimization algorithm problem is hyper parameter selection is a kind of continuous optimization problem, and feature selection is a kind of binary optimization problem.

III. OVERVIEW OF PROJECT

3.1. Grid Computing

Grid computing is the combination of computer resources from multiple administrative domains applied to achieve a goal, it is used to solve scientific, technical or business problem that requires a great number of processing cycles and needs large amounts of data.

One of the main strategies of grid computing is using software to divide and apportion pieces of a program among several computers, sometimes up to many thousands.

Some advantages of Grid Computing are,

- Results can then be concatenated and analyzed upon job(s) completion.
- Much more efficient use of idle resources. Jobs can be farmed out to idle servers.
- Grid environments are much more modular and don't have single points of failure. If one of the servers/desktops within the grid fails there are plenty of other resources able to pick the load. Jobs can automatically restart if a failure occurs.

- A client will reside on each server which sends information back to the master telling it what type of availability or resources it has to complete incoming jobs.
- Jobs can be executed in parallel speeding performance.

Grid environments are extremely well suited to run jobs that can be split into smaller chunks and run concurrently on many nodes. Using things like MPI will allow message passing to occur among computer resources.

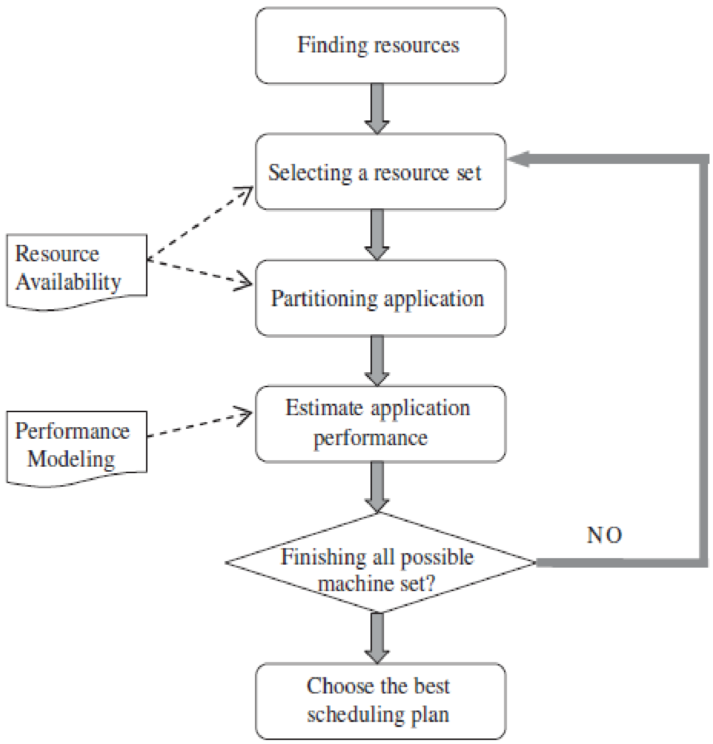

Fig.3.1: Flowchart of Scheduling Distributed Applications

Dynamically sharing resources gives rise to resource contention. One of the challenging problems is deciding the destination nodes where the tasks of grid application are to be executed. From the perspective of system architecture, resource allocation and job scheduling are the most crucial functions of grid computing.

These functions are based on adequate information of available resources. Thus, timely acquiring resource status information is of great importance in ensuring overall performance of grid c**8.1**

IV. Source Code

PSO Algorithm

```
import java.util.*;
import gridsim.*;
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
```

```
public class Main extends JFrame implements ActionListener
{
// Declare the Menubar,Menu Items Objects array and Database
JMenuBar mnubar;
JMenu mnufile,mnupro;
JMenuItem mnuitexit,mnuitnew,mnuitlearn;
JDesktopPane desk;
String strdet[]=new String[15];
int Res;
public static StringBuffer sb=new StringBuffer();
Dimension d=Toolkit.getDefaultToolkit().getScreenSize();
public Main()
{
mnubar = new JMenuBar();
mnufile = new JMenu("File");
mnuitexit =new JMenuItem("Exit");
//mnuitnew=new JMenuItem("Input");
mnupro = new JMenu("Start");
mnuitlearn=new JMenuItem("Schedule");
desk =new JDesktopPane();
this.setJMenuBar(mnubar);
mnubar.add(mnufile);
mnufile.add(mnuitexit);
mnubar.add(mnupro);
//mnupro.add(mnuitnew);
mnupro.add(mnuitlearn);
//mnuitnew.addActionListener(this);
mnuitexit.addActionListener(this);
mnuitlearn.addActionListener(this);
setTitle("task sheduling ");
setSize(d.width,d.height);
setContentPane(desk);
setVisible(true);
//creating object for textarea InternalFrame
textarea objtxta=new textarea();
addFrame(objtxta);
}
```

```
public void actionPerformed(ActionEvent ae)
{
Object obj=ae.getSource();
if (obj==mnuitnew)
{
Res = Integer.parseInt(JOptionPane.showInputDialog(null, "Enter The No of Resources : ", "3"));
}
if (obj==mnuitexit)
{
String[] opt={"yes","no"};
int selection =JOptionPane.showOptionDialog(null,"Do You want to
Exit","Confirmation",JOptionPane.YES_NO_OPTION,0,null,opt,opt[1]);
if (selection==0)
{
System.exit(0);
}
}
if (obj==mnuitlearn)
{
PSO A=new PSO(50);
}
}
public void addFrame(JInternalFrame obj)
{
new CenterFrame(obj);
desk.add(obj);
try
{
obj.setSelected(true);
}
catch(java.beans.PropertyVetoException e2){}
}
public static void main(String[] args)
{
new Main().show();
}
```

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V. CONCLUSION

A distributed resource monitoring and prediction architecture that seamlessly combines grid technologies, resource monitoring, and machine learning-based resource state prediction . This system consists of a set of distributed services to accomplish all required resource monitoring, data gathering, and resource state prediction functions.

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