CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENTS

6.1 CONCLUSION

Cluster computing is a method of harnessing the power of many computers in a network to solve problems requiring a large number of processing cycles and involving huge amounts of data. So rather than using a network of computers simply to communicate and transfer data, cluster computing taps the unused processor cycles of many computers. The basic difference between a network and distributed systems is that, a network just provides a pipe for the resources to communicate whereas in the case of distributed systems the communication between the nodes take place in a more coordinated fashion.

There are applications which demands for higher computational power and purchasing supercomputers is not affordable to many organisations therefore cluster computing paves way to run the computationally complex applications by sharing the workload with other available computers in the premises. The clusters will be of homogeneous type. Clusters of clusters are termed as Grid computing which is developing in a faster rate. There are many tools available to perform this cluster and Grid computing. Each and every tools has its own merits and demerits.

The various tools are experimented by deploying sample complex programs and their performance is studied. Few tools that have been taken
and explored in this dissertation are Parallel Virtual Machine that supports heterogeneous group of computers connected together, tested by running a computationally complex application and its performance is evaluated. It shows that by increasing the number of systems the execution speed is increased.

The other tools like Pooch and XGRID’S are the Apple Macintosh products. The architecture of the system is well designed to suit cluster computing. These tools also proves that complex applications can be run in a cluster to minimize the computational speed for complex applications. The Apple machines do not support other operating systems.

The other popular tool is Globus tool kit and the experimental and the results proves that the complex applications can be distributed in this cluster to get completed with increased execution speed. The tool is very tedious to install and configure. Too many accessories in software are to be installed and configuring the software is also very difficult. The SUN Grid Engine is used to perform cluster computing. The users must submit their jobs through shell script. Due to communication delay in the NFS communication process comparatively the performance is slower.

The developed tool is built in Java. The Java RMI is effectively used to design and develop this tool. The tool is of highly modular in nature. Any module can be removed, enhanced or re-plugged again. This tool supports both batch and parallel jobs. The experimental result conveys that the developed tool performs better than the SGE tool. In this thesis, the developed tool provides flexibility in choosing the best node and the scheduling policy. The result from this study suggests that the developed tool can be used to perform effectively both batch and parallel jobs and increases the execution speed considerably. The throughput is increased in the newly developed tool
because there is negligible communication delay (user submits the job directly by specifying the job’s location). The job is submitted in shell Script in case of SUN Grid Engine tool but it is not so in our newly developed tool.

6.2 FUTURE ENHANCEMENTS

Since the cluster tool is developed in java, it can be extended to work with any platform which will help to create a cluster computation environment. It can be extended to support interactive jobs. Various scheduling policies can be integrated easily by implementing them in java. Submitting the jobs to the specified system architecture, displaying the status of the execution nodes like memory & CPU usage and controlling the launched job at the execution node from the server can be implemented. The user GUI can be extended to edit the configuration files of the tool. The tool can be linked with a web Portal that helps the user to submit jobs through internet. Security can also be taken into consideration for further enhancement.