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Load balance for Heterogeneous parallel computing

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A computer is used in all fields by a price cutting of the computer and a remarkable performance improvement. We, such as CG currently used on television, the movie, etc. and a simulation experiment for developing the 3-dimensional image data processing for medical diagnostic imaging and a new product, came to receive the benefit of a computer closer.

In the science and technology calculation field, data and information have become complicated in a huge quantity. Parallel computing is used well for large-scale calculation. In order to solve such a problem, a more highly efficient computer is needed. However, it is not easy to purchase a highly efficient computer.

On the other hand, the high performance networking has generalized remote computing. The research on parallel/distribution calculation using the calculation resources arranged arbitrarily in the large network area attracts attention. And by which Local Area Network is generally built widely – distribution of the load between computers and sharing of resources were attained by the spread of such computer networks.

Grid computing is a calculation system using the calculation resources distributed on the wide area network. It is becoming possible with highly-efficient of a parallel computer and network technology to perform large-scale technology calculation which was impossible until now.

Moreover, it is possible to use the existing computer network as a part of parallel computer as it is, as compared with the case where the parallel

computer of exclusive use is introduced, an economical problem is eased sharply.

However, control of the optimal load distribution in the difference in the performance of each computer is needed, and Generating of the data transmission time between computers poses a problem.

When heterogeneous parallel computing in a division-into-equal-parts rate was performed by this research using the benchmark of parallel computing, the difference in the throughput of each computer was made, and the speedup ratio of the whole calculation did not improve in accordance with the low machine of capability.

In this research, in order to raise the speedup ratio in heterogeneous parallel computing, load distribution was optimized.

The procedure for optimizing load distribution is shown.

- Measurement of the throughput of each computer used for parallel computing before performing heterogeneous parallel computing.

In order to perform load distribution, it is to know the throughput of each computer beforehand. Therefore, it performs a program each one computer at a time, and execution time is made into throughput.

- Load distribution according to the throughput of each computer is performed.

Calculation without the dependency of data is performed. here is also the purpose which makes communication load mitigate by performing .

- Task assigned to each computer is fluctuated in consideration of network load.

Task assigned to the high computer of network load in consideration of network load It lessens.

By using the above method, the speedup ratio of the whole heterogeneous parallel computing improved.