An Algorithm for Allocating DVE Environment with Objects Consideration for Heterogeneous System

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Abstract
Distributed Virtual Environment (DVE) systems model and simulate the activities of thousands of entities interacting in a virtual world over a wide area network. These systems are composed of many servers each of which is responsible to manage multiple clients who want to participate in the virtual world. Each server delivers the information updated from different clients to other client in virtual world. Previous algorithms were proposed for balancing the workload among the servers of the DVE. However, these algorithms did not take into consideration active objects found in the virtual environment which affects the calculations of system cost. They also assumed homogenous environment where all servers have the same capabilities and all links have the same speed. This paper presents a partitioning algorithm that takes into account the active objects and a modified object layering algorithm that concentrates only the boarder to improve the performance (total cost of the system and execution time) of Distributed Virtual Environment. This paper also generalizes the system to be heterogeneous in servers' speed and link capacity. The evaluation results show that the performance of the allocation algorithm is significantly improved where the total system cost was reduced.

References

Index Terms

Computer Science

Distributed Systems

Keywords

Distributed virtual environment

Scalability issue

Partitioning algorithm

Load

balancing

Communication reduction

linear optimization