Performance-Effective and Contention-Free Broadcasts on Irregular Network with Heterogeneous Workstations

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Abstract

With the advance of network and computer techniques, the development of scalable computing becomes a new trend. To integrate and utilize distributed and heterogeneous resources efficiently, message broadcasting is an important and crucial technique for such systems. In this paper, we present a Location Aware Broadcast Scheme (LABS) for performing broadcast on irregular heterogeneous network. The LABS introduces a new scheduling scheme that based on heterogeneity of workstation and network topology. Together with a binomial tree optimization technique, LABS can arrange communications in a contention free and shortest routing path manner. To evaluate the performance of LABS, we have implemented the proposed techniques along with other algorithms. The experimental results show that LABS has good performance in different circumstances. Especially, LABS has significant improvements when the environment is with high heterogeneity.

Keyword：Broadcast, Irregular Network, Heterogeneous Computing, Heterogeneous Network, Contention Free