Comparative Evaluation of Request-Partitioning-based Processor Allocation Strategies in 2D Mesh-based Multicomputers

Abstract

Request-Partitioning-Based (RPB) allocation schemes remedy the problem of fragmentation by allowing parallel requests to be allocated non-contiguously in case contiguous allocation...
fails. Two RPB allocation schemes are proposed in literature; the Adaptive Non-Contiguous Allocation (ANCA) and the Bounded-Gradual-Partitioning (BGP) allocation. In ANCA, the frame requested by the parallel job is subdivided into two subframes of equal sizes at the longest dimension of the request. In BGP, requests are gradually partitioned into one large and another small subframe of multicomputers. In this paper, ANCA and BGP based allocation strategies are comparatively evaluated through exhaustive simulation-based experiments. Our experimental results also showed that the ANCA scheme can sustain higher system and communication loads compared to BGP in terms of major system performance metrics. We also observed that, in the BGP approach, increasing the partitioning bound value can slightly improve the performance of the parallel system. Comparatively, increasing the partitioning bound in the ANCA approach could significantly improve the performance of the parallel system.

Reference

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**Index Terms**

Computer Science

Parallel Systems

**Key words**

Non-contiguous allocation 2D-Mesh Multicomputers

Request-Partitioning

ANCA

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