

Embedding Cycles and Meshes onto Incomplete Hypercubes

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Abstract

An incomplete hypercube is a generalization of the hypercube in the sense that the number of nodes can be an arbitrary integer number. Moreover, we can enlarge its system size without reconfiguring the links. In this paper, we study the incomplete hypercube's ability to execute parallel algorithms using embedding technique. Since many algorithms have been proposed for linear arrays, cycles and meshes, the issues of embedding these interconnection networks are addressed. On the other hand, a multiprogramming system may only allocate part of the whole system for a task. Hence, we are motivated to study the problem of how to embed these interconnection networks of an arbitrary size into the incomplete hypercubes. For these embedding issues, we have proposed algorithms to enumerate these interconnection networks on the incomplete hypercubes optimally and definitely, except only to prove the existence of these optimal embeddings.

Key words : Cycle;mesh; Hypercube; Incomplete hypercube; Embedding