Abstract:

Torus network has become increasingly important to multicomputer design because of its many desirable properties including low bandwidth and fixed degree of nodes. Also, torus networks can be partitioned into mesh networks. The multicast pattern, in which one source node sends the same message to multiple destination nodes, is the essential pattern in a wide variety of applications. This paper proposes a multicast routing scheme in 2D torus networks. The proposed scheme is a Tree-based Algorithm which Splits torus Networks into two Equally Meshes, hence it is called TASNEM. TASNEM algorithm is a tree-based technique, in which the router simultaneously sends incoming flits on more than one outgoing channel. It requires at most two start-up times, one for each mesh subnetwork. For each mesh subnetwork, the source node delivers a message to the destination nodes along one main path and different horizontal paths branched from the main path. TASNEM algorithm can achieve high degree of parallelism and low communication latency over a wide range of traffic loads. Performance results of a simulation study on torus networks are discussed to compare TASNEM algorithm with some previous algorithms.