A Wavelength Assignment Algorithm of Parallel LU Decomposition Communication Pattern on WDM Ring Interconnection Network

Yawen Chen, Fangai Liu
Department of Computer Science, Shandong Normal University,
Jinan, Shandong, China, 250014
E-mail: chyw1980@hotmail.com

ABSTRACT

Wavelength assignment is a key topic in WDM optical interconnection networks. Since there are different communication patterns according to different parallel algorithms, how to realize these communication patterns on optical interconnection networks is a hot research field. Based on the WDM ring interconnection network, a kind of parallel LU decomposition communication pattern is designed and the wavelength assignment of realizing this communication pattern on WDM ring is discussed. By embedding the communication pattern of a special bipartite graph into the WDM ring, an algorithm to embed the parallel LU decomposition communication pattern into the WDM ring is designed. The minimum number of wavelengths required to realize this communication pattern on WDM ring with n^2 nodes is $n^2/4$ when n is even and $(n^2-3)/4$ when n is odd.

Keywords: LU decomposition, wavelength assignment, parallel processing, WDM ring, network embedding