

A Study of the Permutation Admissibility of A Modified Omega Network

By

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Abstract

The class of fault-tolerant redundant path (R-path) multistage networks was derived from Omega networks by Padmanabhan and Lawrie who proved that the new network class retained all the connection properties of the parent networks in the absence of faults. In the thesis a simple window method that allows determining the admissibility of any BPC (Bit Permutation Complement) permutation to an R-path Omega network is introduced. A study of the permutation admissibility of an R-path Omega network is based on a computational exploration with C language program and deals with the variable sizes of a network and switching element. It is shown that the permutation capability of R-path Omega networks is much better than that of the parent networks. For example such powerful and frequently used in parallel programming permutation as perfect shuffle is admissible to all possible configurations of R-path Omega networks being non-admissible to 1-path Omega networks.