

Ring-Mesh Architecture Selection Model in Integrated Self-Healing Network Design

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ABSTRACT

This paper discusses a design of integrated ring-mesh architecture in survivable communication networks. It is known that the integrated architecture is more economical than the architecture which is composed of only rings or mesh. In the architecture, the demand requirement is covered with several ADM rings and B-DCS mesh. Given a set of demand requirements, the ring mesh architecture selection problem is formulated as a mixed integer programming model to find a set of rings and mesh which satisfy the demand requirements and ring capacity constraints such that the electronic equipment cost of ADM and B-DCS is minimized. As a solution procedure, tabu search is developed with a recency based short term and a frequency based long term memory structure. Computational results show that the proposed tabu search provides an optimal solution within a few seconds in problems with 15 nodes. Even in problems with more than 30 nodes the proposed tabu search improves the network cost of an initial solution by approximately 20%.