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A Multitype Concentrator Location Problem with a Choice of Terminal Coverages

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Abstract

In recent years remarkable progress in the development of the topological design of computer communication networks has been witnessed. One of the important aspects of the topological design of computer communication networks is the concentrator location problem. When the system reliability and availability is critical in computer communication networks, it may be desirable to assign additional concentrators as backups to a terminal. The extended version of the multitype concentrator location problem is considered in which various terminal coverages are allowed to improve reliability and availability with a choice of concentrator type. This problem is a complex combinatorial problem that belongs to the class of NP-complete problems where the computation of an optimal solution is still a challenging task. A decomposition-based algorithm is proposed. This algorithm incorporates resource-directive decomposition and price-directive decomposition into a single framework to reduce the computational difficulty. Computational results are quite encouraging.

Keywords: Communication Networks, System Reliability, System Availability, NP-Complete Problems.