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Communication needs to realiable in order to be of real value for the customers using modern communication networks. A wellknown path protection method is Shared Backup Path Protection (SBPP) for protection of circuit-switched communication demands (e.g. MPLS paths or lightpaths in DWDM networks). When using SBPP protection, the traffic is for each customer split such that both a *working* path is established and a *backup* path is established. The working path is then used until a failure occurs which affects the working path, e.g. a cable break. Only then is the communication switched over to the backup path. Because the backup path is only used in case the working path fails, backup paths for working paths which will never fail in the same situation, can share capacity.

SBPP is an attractive protection method, given that it is already supported by standards and that it should achieve good capacity efficiency [1]. Unfortunately, routing the working and backup paths is a complex optimization problem [2].

In this presentation we will describe how the compact MIP model. We will prove that the problem is NP-hard and we will Dantzig-Wolfe decompose the model, such that the working and backup paths can be generated separately for each demand. Unfortunately, this subproblem is hard to solve, both theoretically [1] and in practice. Hence, the variables are split in working paths and backup paths. This enables a faster sub-problem solution. We further show how the branching method described in [3] and refined in [4] can be used for SBPP planning using Branch & Price. Finally we test the Branch & Price algorithm on a number of real-world networks of up to 50 nodes achieving small gaps. The tests confirm that SBPP is indeed a very efficient protection method.

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