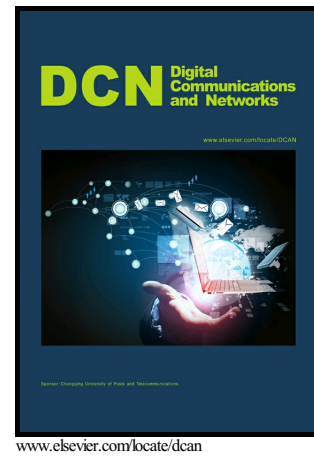


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An Efficient Hybrid Protection Scheme with Shared/Dedicated Backup Paths on Elastic Optical Networks

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ABSTRACT

Fast recovery and minimum utilization of resources are the two main criteria for determining the protection scheme quality. We address the problem of providing a hybrid protection approach on elastic optical networks under contiguity and continuity of available spectrum constraints. Two main hypotheses are used in this paper for backup paths computation. In the first case, it is assumed that backup paths resources are dedicated. In the second case, the assumption is that backup paths resources are available shared resources. The objective of the study is to minimize spectrum utilization to reduce blocking probability on a network. For this purpose, an efficient survivable Hybrid Protection Lightpath (HybPL) algorithm is proposed for providing shared or dedicated backup path protection based on the efficient energy calculation and resource availability. Traditional First-Fit and Best-Fit schemes are employed to search and assign the available spectrum resources. The simulation results show that HybPL presents better performance in terms of blocking probability, compared with the Minimum Resources Utilization Dedicated Protection (MRU-DP) algorithm which offers better performance than the Dedicated Protection (DP) algorithm.

Keywords

Hybrid protection, Elastic Optical Networks, backup shared resources, efficient energy cost, minimum resource utilization, and modulation format.

1. Introduction

New services such as video-conferencing, online games, telemedicine, social networks and peer to peer traffic constitute most of the Internet traffic today. The development of such services requires new modulation formats in telecommunication networks. Current optical transport networks are based on Wavelength Division Multiplexing (WDM) technologies. In these networks, the total optical spectrum is

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