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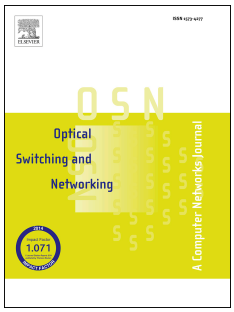

Recent research progress on spectrum management approaches in software-defined elastic optical networks

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Recent research progress on spectrum management approaches in software-defined elastic optical networks

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Abstract

The flex-grid technology or elastic optical network (EON) is accepted to be a propitious solution for the future transport network due to its unique properties, which are bandwidth aggregation that creates super wavelength channels, different data rate accommodation, bandwidth segmentation that creates sub-wavelength channels, and elastic variation of assigned bandwidth. The software-defined network (SDN) is incorporated with the emerging technology of EON for enhancing its performance by enabling dynamic provisioning and releasing of optical lightpaths. This reduces the required time for lightpath control, which leads to improve the network performances. This paper exploits the software-defined elastic optical network (SD-EON) by identifying its architectures, existing literature, resource management approaches, and future challenges. In addition, the performance of EONs related to the SDN technology is compared in terms of blocking probability. Numerical results indicate that the SD-EON accommodates 25% more admissible traffic than the EON without considering SDN, when the acceptable blocking probability is considered 0.01.

Keywords: Software-defined elastic optical networks (SD-EON), resource management, and node architecture.

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