

University : Istanbul Technical University
Institute : Institute of Science and Technology
Science Programme : Computer Engineering
Programme : Computer Engineering
Supervisor : Asisst. Prof. Dr. Feza BUZLUCA
Degree Awarded and Date : M.Sc. – January 2007

ABSTRACT

PROVIDING SURVIVABILITY IN OPTICAL WDM MESH NETWORKS CONSIDERING ADAPTATION

Kader AYDIN

WDM optical networks are able to meet the rapid growth of bandwidth demands and are considered to be the most appropriate choice of future Internet backbone. However, the failure of a network component such as a fiber link can lead to the failure of all the lightpaths that traverse the failed link. Therefore, the huge bandwidth of WDM also requires efficient survivability mechanisms. Recently, new techniques have been proposed to efficiently deal with this problem in mesh networks. Among them, shared-path protection is a promising candidate because of its desirable resource efficiency, which is a result from effective backup sharing. Backup paths can share wavelength channels, when their corresponding working paths are mutually diverse. Therefore, shared-path protection can outperform other protection techniques based on the dedicated reservation of backup capacity. In this work, we focus on rerouting feature to design an efficient algorithm, called Adaptable Shared Path Protection (ASPP), for dynamic provisioning of shared-path-protected connections in optical mesh networks employing WDM. In particular, backup-channel capacity reservation in shared-protection causes too much resource consumption parallel to network load. ASPP provides the adaptation of network against dynamic traffic, and decreases blocking probability thanks to rerouting capability of paths. Also, ASPP can present SLA by providing an uninterrupted traffic flow for connection requests come with a high priority.

Keywords: optical WDM networks, survivability, adaptation, shared-path protection.

Science Code: 619.03.03