Title : **A STUDY OF ARCHITECTURE AND COMPARISON OF INTERNET PROTOCOL (IP) OVER DENSE WAVELENGTH DIVISION MULTIPLEXING (DWDM) AND OTHER TECHNOLOGIES**

By

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ABSTRACT

An industry survey indicated that in 1995, the amount of embedded fiber already in use in the average network was between 70 percent and 80 percent. Today, many carriers are nearing one hundred–percent (100%) capacity utilization across significant portions of their networks. Another problem for carriers is the challenge of deploying and integrating diverse technologies in one physical infrastructure. Customer demands and competitive pressures mandate that carrier offer diverse services economically and deploys them over the embedded network. DWDM provides service providers an answer to that demand. This study deals with the concept of transmitting raw Internet Protocol (IP) packets over an optical layer, which employs Dense Wavelength Division Multiplexing (DWDM) for increasing its bandwidth demand. This study also gives an introduction to the DWDM architecture. This study also evaluates the pros and cons of implementing SONET in IP over DWDM networks. The comparison of IP over DWDM and SONET were also discussed here base on bandwidth capability, reliability, and cost and so on. Finally, the protocol architecture that based on the Multiprotocol Lambda Switching (MPLS) was also discussed.

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2.1 INTRODUCTION

The evolution of the network has reached new frontiers both in terms of the traffic it carries as well as in the advancement of technologies that are used to build the network. One of the most potent technological advancements in this category has been the development of DWDM. DWDM technology has greatly increased the bandwidth of the optical fiber but high volumes of bursty data traffic have exposed the shortcomings of the existing technologies, which use the DWDM principle.

Better and intelligent management of the existing DWDM networks coupled with removing the redundancies caused by some networking equipment in use today will ensure higher data rates and capability of handling bursty volume of traffic. One such technology being actively pursued is the IP over DWDM, which uses the transmission of IP packets directly through the DWDM layer instead on relying on the intermediate SONET/SDH or ATM layers to do the transmission.