Development the Methods of Conversion to Photonic Transport Networks

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Abstract - **the work devoted to issues that arise during the transition to photonic networks.**

Keywords – **optical network, photonic network, lambda switching, MPLS, DWDM.**

I. INTRODUCTION

Current progress in all optical transport systems using DWDM is really incredible. Recent technological advances in dense wavelength division multiplexing (DWDM) allowed close approach to solve problems associated with its overload, especially where information flows are extremely high. Photonic transport networks will be the next step in the development of optical networks

II. CONVERSION TO PHOTONIC NETWORKS

Currently, a new technology of processing optical signals, known as lambda switching, was created. It is operate on the principle of switching IP-packets on labels, implemented in the protocol MPLS.

Using of lambda-switching gives operators the following features:

• provide high scalability network infrastructure;
• minimize the number of services imposed;
• increase the effectiveness of available bandwidth;
• obtain additional income by providing services that use specific wavelengths.

Current optical networks typically have a four-level protocol stack: the physical bandwidth corresponds DWDM, transport functions assigned to SONET / SDH, traffic management implemented on ATM-level and application protocol using IP.The common disadvantage of such layered architecture is the so-called lowest common denominator effect: one with levels often limits the system as a whole, for example reduces the scalability of the network.

Logical to assume that for a long time in the SPD will dominate traffic IP, so the slow aggregation of data flows with high-speed applications require high-speed routers.If we consider flows of IP-packet transmission which can do without the technology of DWDM, then processing them to use statistical multiplexing. This means that rapid productivity growth equipment optical networks will remove from the network model level SONET / SDH and ATM; respective functions over time will carry routers, optical switches and devices DWDM. Network infrastructure, resulting, it becomes more efficient from an economic point of view and thus able to transport huge amounts of heterogeneous traffic.

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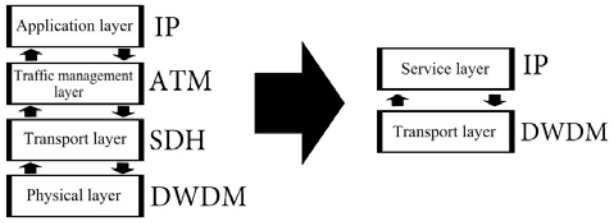

Fig. 1. The transition from optical networks to photonic

Instead of four, it will include only two levels - transport (photon) and service. Initially, the first fall of optical switches and wavelength multiplexing, and in the other - routers, ATM-switches and multiplexers input / output. But gradually some of these devices will cease to exist as separate components of the optical network.Interaction between different elements in the new network architecture through common standardized platform management (control plane). That allows it to integrate optical equipment of new generation and legacy devices into a single heterogeneous environment.

The appearance of lambda switching technology requires a new management protocol connections between adjacent nodes of optical networks (Link Management Protocol, LMP). And of course, the implementation of the lambda-switching networks, in particular the crucial role for physical media of the new technology.

Existing problems photonic networks require new approaches and methods of calculating the efficiency of operation. The analysis showed that existing methods of calculating the performance of optical networks can not always be used for photonic networks, or used with considerable restraint. Therefore, at present, there is a need for more detailed study of photonic networks

III. CONCLUSION

In this paper described the problems that arise during the transition to photonic networks and described the principle of its work.

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