**Design of Multipath routing Scheme with Load Balancing in MPLS-network**

**ABSTRACT:**

In the paper the mathematical model of multipath routing with load balancing in the MPLS network is proposed. This model describes the processes of routing and distribution links resource. This model takes into account the characters of links (duplex, half duplex or simplex links) and prevents the effect of packets looping. And criterion of load balancing in proposed model is quality service parameters.

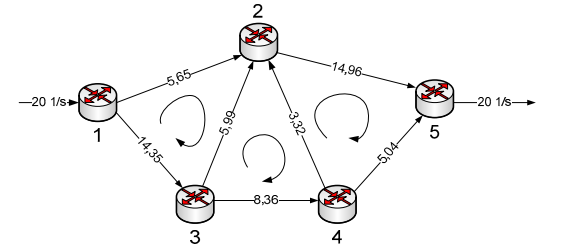
**EXISTING SYSTEM:**

Modernization of existing telecommunication systems and networks (TCN) should be based on effective approaches that are incorporated in Next Generation Network (NGN) concept. NGN concept was created as a general standard for service network architecture to provide a wide range of services with flexible management and user personalization. The analysis of different ways to satisfy QoS requirements shows that the main problem is to solve efficiently the tasks of network layer described in Open Systems Interconnection (OSI) model. We mention that network layer tasks are performed with different routing algorithms.

**PROPOSED SYSTEM:**

The Proposed model is analyzed for different input data and structures of TCN. The research of model is confirmed by its efficiency and adequacy. For our research for an example consider TCN, which presented in Fig.1. The network consists of 5 nodes and 7 links. Source-node is node 1, destination-node is node 5. Links have numerical values, which represent their bandwidth. The analysis of the proposed model for other topologies of TCN shows that improving of values of average delays (and thus quality of service parameters values) depend on the topology of TCN (its heterogeneity, connectivity, the number of paths between source- and destination-node). If the topology of the network is more heterogeneous, this means that there will be more improvement on average delays.

**ARCHITECTURE:**



**Module Description**

**Load-Balancing Scheme:**

Interflow packet order is natively preserved besetting slicing threshold to the delay upper bound at .Any two packets in the same flow slice cannot be disordered as they are dispatched to the same switching path where processing is guaranteed; and two packets in the same flow but different flow slices will be in order at departure, as the earlier packet will have depart from before the latter packet arrives. Due to the fewer number of active flow slices, the only additional overhead in, the hash table, can be kept rather small, , and placed on-chip to provide ultrafast access speed. This table size depends only on system line rate and will stay unchanged even if scales to more than thousand external ports, thus guarantees system scalability.

**Multipath Routing with Load balancing:**

Through lay-aside Buffer Management module, all packets are virtually queued at the output according to the flow group and the priority class in a hierarchical manner. The output scheduler fetches packets to the output line using information provided by. Packets in the same flow will be virtually buffered in the same queue and scheduled in discipline. Hence, intraflow packet departure orders hold as their arriving orders at the multiplexer. Central-stage parallel switches adopt an output-queued model. By Theorem, we derive packet delay bound at firststage. We then study delay at second-stage switches. Define native packet delay at stage m of an be delay experienced at stage m on the condition that all the preceding stages immediately send all arrival packets out without delay.

**Load Balancing Based On Quality Of Service Parameters:**

We consider the Multistage Multiplane Clos-network based switch by Chao et a . It is constructed of five stages of switch modules with top-level architecture similar to a external input/output ports. The first and last stages Clos are composed of input demultiplexers and output multiplexers, respectively, having similar internal structures as those in PPS. Stages 2-4 of M2Clos are constructed by parallel switching planes; however, each plane is no longer formed by a basic switch, but by a three-stage Clos Network to support large port count. Inside each Clos Network, the first stage is composed by k identical Input Modules. Each IM is an packet switch, with each output link connected to a Central Module. Thus, there are a total of m identical in second stage of the Close networks

# System Configuration:-

# H/W System Configuration:-

# System : Pentium IV 2.4 GHz.

# Hard Disk  : 40 GB.

# Floppy Drive : 1.44 Mb.

# Monitor : 15 VGA Colour.

# Mouse : Logitech.

# Ram : 512 MB.

# S/W System Configuration:-

* Operating System : Windows 95/98/2000/XP/7/8
* Front End : Java Swing
* Technology used : Java.
* Tools Used : Netbeans 7.2

**Conclusion:**

# Thus in the paper the mathematical model of multipath routing with load balancing based on quality of service parameters in the MPLS network is proposed. Solution of routing problem with help of proposed model allows providing the distribution of traffic between source and destination-node so that delays along every path are equal between each other. Proposed model corresponds to technology Traffic Engineering. Proposed model is a flow model that corresponds to the requirement for traffic in the modern telecommunication networks. Besides that proposed model works for telecommunication networks with simplex links, duplex and half-duplex links. At the same time proposed model has conditions to prevent packet looping. Using the proposed model can improve the values of the average delays by 10% compared with the solution of routing within the previously known models. Solving the routing problem within the proposed model should be used as etalon values for the improvement and configuration of existing routing protocols using load balancing technology.