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### **Study and implementation of DiffServ over MPLS**

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With the increase in the amount of real-time and mission critical traffic, the importance of quality of service (QoS) has increased manifolds. The two QoS architectures in use today are Integrated Services (IntServ) and Differentiated Services (DiffServ), of which DiffServ is the more scalable option. Traffic engineering (TE) enables another dimension to improving QoS. Multi-protocol label switching (MPLS) has opened up new frontiers to cater to the QoS demands with its powerful TE features. DiffServ over MPLS architecture is studied from the point of view of the standards and its practical implementation on Linux. A test-bed consisting of seven Linux machines, five of which are configured as DiffServ over MPLS routers, was set up and experiments were carried out to verify the various scenarios in which the DiffServ over MPLS architecture can prove beneficial. Further to fine tune the results and provide better differentiation, Linux traffic control filters, used for queuing and scheduling, are implemented. The problems with the conventional traffic filter are analyzed and a new filter is proposed. The report also examines the role of Simple Network Management Protocol (SNMP) in providing network management information in MPLS networks. A custom MPLS scalar MIB is written and the Net-SNMP (open source SNMP protocol suite) code, for querying the custom MPLS MIB, has been extended. The ingress label switch router (LSR) is configured as network operation centre (NOC) to enable viewing of interface statistics of all routers on the NOC.