Constraint-Based Routing with Maximize Residual Bandwidth and Link Capacity - Minimize Total Flows Routing Algorithm for MPLS Networks

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Abstract-This research proposes an on-line routing algorithm for bandwidth-based guaranteed tunnels in the Multi-Protocol Label Switching (MPLS) networks, called the Maximize Residual bandwidth and link Capacity - Minimize total Flows (MaxRC-MinF) routing algorithm. The proposed algorithm can be categorized into link-constrained and path-constrained routing problems. It is based on three objectives: minimizing the interference level among ingress-egress pairs, balancing the traffic load over under-utilized paths, and trying to reserve bandwidth for future request. Finally, we have compared the performance of the MaxRC-MinF algorithm with other previously proposed algorithms. We found that the MaxRC-MinF algorithm achieves lower rejection probability and higher total throughput, maximum and average link utilization. However, because of its computational complexity, the proposed algorithm has a few higher CPU calculation time. Keywords Routing algorithm, Constraint-Based Routing, QoS Routing, Bandwidth-based Guaranteed Tunnels, Traffic Management and MPLS network.