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 MaxRCMinF 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.