Integer Programming Model for the Network Design Problem with Facility Dependent Shortest Path Routing

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Abstract : We consider a network design problem which has shortest routing restriction based on the values determined by the installed facilities on each arc. In conventional multicommodity network design problem, a commodity can be routed through any possible path when the capacity is available. But, we consider a problem in which the commodity between two nodes must be routed on a path which has shortest metric value and the link metric value is determined by the installed facilities on the link. By this routing restriction, the problem has a distinct characteristic. We present an integer programming formulation containing the primal-dual optimality conditions to the shortest path routing. We give some computational results for the model.