Theory of Network Communication

Fall 2002

Solution to Assignment 4, problem 11

Problem 11:

The total demand which needs to leave or reach any node v in G is bounded by the demand which needs to leave or reach all nodes in the MBF which are represented by v. Each node in the MBF has a degree of at most 4δ, and thus has demand at most 4δ since there is a demand of 1 for every edge in the MBF. Then each node in G has demand at most $4\delta \cdot (d+1)$ since each represents $(d+1)$ different nodes in the MBF. One could use the marriage theorem to break this routing problem into $4\delta(d+1)$ different permutation routing problems, each of which is solvable with congestion and dilation at most $2F$ according to theorem 1.10. Then the whole routing problem can be handled with dilation at most $2F$ and congestion at most $(8\delta(d+1)F)$.