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QoS供应体系中的新型网络改进算法

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Abstract

This paper integrates traffic engineering (TE) in network planning (network improvement) to build high performance networks, which achieve traffic's multi-constrained quality of service (QoS). It is a NP complete problem that cannot be efficiently solved by traditional network improvement with extending equipments' capability. A new network improvement algorithm based on TE is proposed. A heuristic algorithm of graph's connectivity augmentation is presented to satisfy the topological constraint, a static routing algorithm based on multi-QoS requirements is adopted to satisfy TE constraints, and a genetic algorithm is used to globally search the network with minimum improvement cost and with its capacity of rational allocation. With the simulation analysis, while achieving network's multi-constraint, rebuilding networks by the new network improvement algorithm is only a traffic balancing, but not a local blocking of the existing high performance networks.

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摘要

将流量工程技术应用于网络规划(网络改进)以构建满足业务流量多QoS需求的高性能网络,这是传统网络改进通过设备扩容方法难以有效解决的NPC问题,并在此基础上提出基于流量工程的新型网络改进算法.算法采用网络连通扩充启发式算法保证拓扑约束,基于多QoS约束路由算法满足流量工程约束,并使用遗传算法策略全局寻求改进费用最小网络及容量分配.通过仿真研究表明,该算法构建的网络在满足各网络约束的同时,具有网络负载分配均衡,避免存在局域拥塞的较高网络运行性能.

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