

数学与系统科学研究院

计算数学所学术报告

报告人: **Wei-Kun Chen**

( *School of Mathematics and Statistics, Beijing Institute of  
Technology* )

报告题目:

**Optimal QoS-Aware Network slicing  
for Service-oriented Networks with  
Flexible Routing**

邀请人: 刘亚锋 副研究员

报告时间: 2021 年 10 月 11 日 (周一)

下午 15:30-16:30

报告地点: 科技综合楼

311 教室

## **Abstract:**

In this paper, we consider the network slicing problem which attempts to map multiple customized virtual network requests (also called services) to a common shared network infrastructure and allocate network resources to meet diverse quality of service (QoS) requirements. We first propose a mixed integer nonlinear program (MINLP) formulation for this problem that optimizes the network resource consumption while jointly considers QoS requirements, flow routing, and resource budget constraints. In particular, the proposed formulation is able to flexibly route the traffic flow of the services on multiple paths and provide end-to-end (E2E) delay and reliability guarantees for all services. Due to the intrinsic nonlinearity, the MINLP formulation is computationally difficult to solve. To overcome this difficulty, we then propose a mixed integer linear program (MILP) formulation and show that the two formulations and their continuous relaxations are equivalent. Different from the continuous relaxation of the MINLP formulation which is a nonconvex nonlinear programming problem, the continuous relaxation of the MILP formulation is a polynomial time solvable linear programming problem, which makes the MILP formulation much more computationally solvable. Numerical results demonstrate the effectiveness and efficiency of the proposed formulations over existing ones.

**欢迎大家参加！**