

Theory for the design of robust inter-domain routing protocols

Aaron D. Jaggard
Tulane University

Friday, February 10, 2006
L01 Carson Hall, 4:00 pm
(Tea 3:30 pm Math Lounge)

Abstract

The Border Gateway Protocol (BGP), the inter-domain routing protocol for the Internet, allows for a wide variety of routing policies that may interact in unintended and unstable ways. Recent work on BGP and related protocols has begun to incorporate formal protocol models; these models have enabled rigorous descriptive analyses of BGP. More recently, such models have been used to give prescriptive guidelines for the design of new protocols. These guidelines include both sufficient conditions for good routing behavior and limitations on what can be achieved without coordination between routers (i.e., limitations on centralized algorithms). Here we review potential routing problems, formal models that describe routing at different levels of abstraction, and some of the results proved using these models. Finally, there are additional complications when policy interactions within an autonomous domain are considered; we also discuss ongoing work to address these concerns as well as future directions for our work.