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Networks with Advance Reservations: The Routing Perspective

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Abstract

This paper provides an initial look at how support for advance reservations affects the complexity of the path selection process in networks. Advance reservations are likely to become increasingly important as networks and distributed applications become functionally richer, and there has been a number of previous works and investigations that have explored various related aspects. However, the impact of advance reservations on path selection is a topic that has been left largely untouched. This paper investigates several service models for advance reservations, which range from the traditional basic model of reserving a given amount of bandwidth for some time in the future, to more sophisticated models aimed at increasing the flexibility of services available through advance reservations. The focus is primarily on the issue of computational complexity when supporting advance reservations, and in that context, we derive a number of algorithms and/or intractability results for the various models we consider.