

Colored GSPN Models for the QoS Design of Internet Subnets

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Abstract. In this paper we develop an approximate colored GSPN model to study the behavior of short-lived TCP connections sharing a common portion of the Internet for the transfer of TCP segments. The CGSPN model is then paired with a very simple approximate model of the IP network used by TCP connections, and the two models are jointly solved through an iterative procedure. The combined model allows the investigation of the Quality of Service (QoS) tradeoffs between network cost and network parameters, thus allowing a QoS-based design, dimensioning and planning of portions of the Internet. The QoS predictions generated by the model are validated against results of detailed simulation experiments in a realistic networking scenario, proving that the proposed modeling approach is very accurate.