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Performance Analysis of Communication Networks Based on Conditional Value-at-Risk

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Abstract: In this paper, we present an analysis of optimization and risk calculation in Communication Networks (CNs). The model is proposed for offline traffic engineering optimization with bandwidth allocation and performance analysis. First, we introduce an optimization model in the CN and derive the optimal bandwidth capacity. Then, we analyze the profit shortfall risk in the CN by using a conditional value-at-risk approach for two typical arrival processes of traffic demand: Poisson arrival process and uniform distribution arrival process. Finally, we give numerical results to show the impact of risk averseness and compare how the characteristics of these two arrival processes of traffic demand affect the network performance.

Keywords: *Communication networks; performance analysis; stochastic traffic engineering; conditional value-at-risk; optimization.*

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