

Using Taguchi's Approach in Determining and Ranking Factors that Affect the Performance of Dynamic Source Routing Protocol in Mobile Ad Hoc Networks

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Abstract

In this paper, we show a systematic procedure of using Taguchi parameter design in analyzing Dynamic Source Routing (DSR) protocol performance. Many performance evaluation of routing protocols have been done through trial-and-error simulation experiment. A mobile ad hoc network is a collection of dynamic mobile nodes that forms a temporary network without using any kind of existing network infrastructure or centralized administration where DSR is one of the most popular routing protocols in such novel networks. Several factors that could affect the protocol performance are such as terrain, network size, node velocity, pause time, transmission range, traffic load, and packet rates. We are able to determine and rank the significance of factors that affect the performance of the protocol through the Taguchi's approach. The findings are that factors such as network size, pause time, node velocity, and traffic load are statistically significant and their importance is ranked in decreasing order respectively.

Keywords: Taguchi's approach, design of experiment, dynamic source routing, mobile ad hoc networks.

2000 Mathematics Subject Classification: 62K25, 62P30, 90B18.