Abstract

In this paper, a new approach is proposed to predict the fractal behavior of a distributed network traffic. In this research, traffic traces are collected from a distributed network operated by NETRESEC an independent software vendor with focus on the network security field, network forensics and analysis of network traffic. A traffic analysis on packet, connection, protocol and application layers are taken into consideration. Apart from it, an investigation of self-similar and long-range dependent behavioral characteristic is made prior to the collection of traffic traces. Traffic prediction plays an important role in guaranteeing Quality of Service (QoS) in distributed networks due to the diversity of services in a real-time network application. Traffic prediction can be useful for dynamic routing, congestion control and prevention, autonomous traffic engineering, proactive management of the network etc. The forecasting methods can be broadly classified into two categories: linear prediction and nonlinear prediction models. Hence, the idea behind this research is to propose a Multiple Regression-booster equation based on the correlation structure to have a more accurate predicted traffic data result than using the later nonlinear prediction models involving Neural Networks. The traffic is sniffed and exported to NeuroSolutions builder, SPSS and then examined. Further, the exported and dissected traffic
data is fed as input to train the neural network to let it predict the resultant fractal behavior of the distributed network traffic and an equation is proposed to derive the ultimate close network traffic prediction in SPSS.

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**Index Terms**

Computer Science  
Distributed Systems

**Keywords**

Fractal behavior  sniffing  predict  SPSS  NeuroSolution builder  predictor