A Framework for Selecting the Most Reliable Path in a Computer Network using Particle Swarm Optimization (PSO) based on Fuzzy Logic

International Journal of Computer Applications
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Volume 45 - Number 8
Year of Publication: 2012

Authors:
Partha Sarathi Banerjee
J. Paul Choudhury
S. R. Bhadrachaudhuri

10.5120/6797-9131

Abstract

Reliability is one of the most important factors for assessing the performance of the network. Packets should pass through the most reliable path. This paper presents a technique for selecting the most reliable path for communication between node pairs of a computer network. Reliability has been calculated based on the bandwidth utilization by the nodes. Bandwidth utilization has been calculated using throughput, latency-time, TCP segment/packet size and transmission bandwidth of the subsection of the network. Fuzzy Logic membership functions viz. Gaussian function, Bell-shaped function, PI function have been used to find out the most reliable path. Effort has also been made to find out the best fit membership function for selecting the most reliable path. The membership function which gives the minimum average error based on throughput values has been selected. Particle Swarm Optimization (PSO) combined with the best fit membership function has been applied on the same network for the similar purpose. Results have been compared with respect to average error given in the respective methods.

References
- MATLAB Fuzzy Logic Toolbox

**Index Terms**

Computer Science

Networks

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Keywords
Computer Network  Reliability  Fuzzy Logic  Particle Swarm Optimization