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Official Opening of the ICONAT-2022

24 August 2022 Meeting Salon I – Antalya AKEV University

Meeting ID: 939 7615 4284

Passcode:

08.00 The Start of Registration Process

09.30 Official Opening of the ICONAT-2022
Welcome by Conference

Prof. Dr. Abidin Kılıç,
Eskisehir Technical University, Türkiye
Chairman of Organization Committee

Prof. Dr. Omarov Murad,
Vice-Rector, NURE, Ukraine

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HONORARY PRESIDENT OF CONGRESS

Invited Speaker
Prof. Dr. Orhan Gemikonaklı

Invited Speaker
Prof. Dr. Atilla Aydınlı

Invited Speaker
Prof. Dr. Ali Demirsoy

12.30 **Lunch Break**

19.00 **Conference Dinner**

POSTER PRESENTATION SEASION: 25.08.2022 Thursday-10.00-16.00
LAST MEETING: 26. 08 2022

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ABSTRACTS

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152-PP

RESULTS OF AN EXPERIMENTAL STUDY OF THE FAULT-TOLERANT ROUTING METHOD WITH THE GLBP PROTOCOL

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ABSTRACT

This work proposes the results of an experimental study of a fault-tolerant routing method in an infocommunication network. The method implements proactive and reactive protection of the default gateway to provide a high level of network fault tolerance. Therefore, method is based on solving an optimization problem related to calculating primary and backup routes and determining the order of balancing the load incoming to edge routers from access networks. If one of the routers creating the virtual default gateway fails, the method changes the load balancing order between the functional border routers. Causes of failure can include overloading, low equipment reliability, hardware and software router failures, and violation of their network security level (compromise). The method considers the flow-based nature of network traffic, and the optimality criterion of routing solutions under Traffic Engineering is a minimum upper bound of network link utilization. To evaluate the effectiveness of the solutions, they were implemented on Cisco equipment. In the lab experiment, the Gateway Load Balancing Protocol functionality was used. Based on this fault-tolerant routing protocol, it is possible to set weighting coefficients administratively, the value of which affects the order of load balancing on the border routers. During the experiment, the weighting coefficients were adjusted not heuristically but according to the calculations obtained by the studied fault-tolerant routing method. The results of the study confirmed the effectiveness of the proposed solution. Ensuring optimal load balancing between border routers compared to the solution based on multipath routing, but without access layer balancing, improved network performance by 25.45% and reduced the upper bound of network link utilization by an average of 63.77 %. Lowering the utilization upper bound positively affects the quantitative values of the main Quality of Service indicators – the average end-to-end delay, jitter, and packet loss probability.

Keywords: network, routing, fault-tolerance, method, experiment