

TECHNIQUES FOR MANAGING DATA FLOWS IN INFORMATION COMMUNICATION NETS

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The paper deals with the issues of increasing the efficiency of data processing in information communications nets of critical infrastructure systems (CIS ICN). The method for adaptive control of data flow distribution is proposed. A set of parameters is divided into subsets of basic and variable control parameters. Variable parameters can be the content of tasks, users, the request rate, capabilities of the equipment. The basic stages of the technique:

- identifying the channels where the bandwidth is not sufficient,
- assessing the costs associated with data delays in these channels,
- assessing the probability that there is no flow in the channels,
- solving the task of minimizing the total cost of network operation.

The developed method differs from other ones as it enables taking into consideration probable changes in the requirements of applied tasks or user activity for various types of communication channels and solves the problem of reducing the total cost of data transfer. The case of increasing the number of system application tasks, network users and, respectively, the request rate is considered.

Since centralized data processing and storage techniques are often used in CIS, the task of network resource distribution for a multi-server node is considered. The technique for distributing resources is proposed; this technique includes the following stages:

- determining the server characteristics,
- calculating the generalized and average characteristics of nodes,
- calculating costs associated with downtime of tasks in the queue and server downtime,
- solving the task of optimizing the costs of maintaining flows.

The improvement of the method lies in the fact that the server system is considered as a set of single-line queuing systems and uses information about the distribution of bandwidth of communication channels.

The use of the proposed methods enables reducing the time of system transaction processing and the total cost of network maintenance costs.

References:

1. Kosenko V. Methods of managing traffic distribution in information and communication networks of critical infrastructure systems / Kosenko V., Persiyanova E., Belotsky O., Maleyeva O. // Innovative Technologies and Scientific Solutions for Industries. – 2017. - No. 2 (2). - P. 48–55. DOI: <https://doi.org/10.30837/2522-9818.2017.2.048>.