

ABSTRACT

Master dissertation: 91 pp., 27 fig., 25 tables, 1 app., 35 sources.

Actuality. In recent years, the speed of growth of data volume is extremely rapid, it causes these mega-trends in information and communication technologies as a steady increase in the number of mobile devices and popularity of social networking. Because of this, the dimension of networks is constantly increasing, because in order to provide the necessary bandwidth and performance to process, transmit and store such amount of data, it is necessary to increase the network infrastructure. But such a solution leads to a significant complication of the network setup and management process, since the network typically consists of devices from different vendors and network operators must manually configure them to meet the requirements of traffic and network changes. Therefore, traditional approaches to the architecture of the network and its management in the near future will be ineffective, because of this there was a need to search and accept new network models.

Software-Defined Networking (SDN) is one of the most promising solutions for the described situation. This is an approach to network architecture, which greatly simplifies network management, provides flexible and centralized control over it, enhances the use of network resources, reduces operating costs.

Since Traffic Engineering (TE) is one of the main methods to optimize and improve network reliability, and existing technology in this area, although widely used in networks with traditional architecture, does not take into account the unique features of SDN and therefore are not effective enough for them the actual task is to develop new technologies for TE that can use the full potential of the advantages of SDN.

Relationship of work with academic programs, plans, themes. The work performed in accordance with the plan of the department of automated data processing systems and management of the National Technical University of Ukraine "Igor Sikorsky Kyiv Politechnic Institute" within the research theme «Effective Methods for Solving the Problems of the Theory of Schedules» (No. DR 0117U000919).

Purpose of the study – increase the level of reliability of traffic engineering in software-defined networks by using special organized data distribution between routes.

To achieve the goal must perform the following **tasks**:

- to perform the analysis of the factors influencing the safe data transfer in software-defined networks;
- to perform a review and analysis of existing methods for traffic engineering in software-defined networks;
- to develop a method of traffic engineering that takes into account the type of traffic, to reduce the amount of data loss;
- to develop a software implementation of the developed method of traffic engineering;
- to investigate the effectiveness of the developed method and to perform the analysis of the results obtained.

The object of the research – the process of traffic engineering in SDN.

The subject of the research – methods of reliable data forwarding in SDN.

The research methods – graph theory, optimization theory, decision-making theory.

Scientific novelty of the obtained results is to develop traffic engineering method for software-defined networks that uses a generalized metric for routes that takes into account the type of traffic and route parameters, and the decision-making theory to address the issue of redirecting traffic from a damaged area of the network. Using the developed method allows you to increase the level of reliability of traffic engineering in software-defined networks and to reduce the amount of lost data during its transmission.

Publications. Work results are published in abstracts of IVth International scientific-technical conference “Computer modeling and optimization of complex systems”, “Computer science, information technologies and management systems young scientists conference”, Ukrainian scientific-practical conference of young scientists and students “The actual problems of informatization of management decisions” (APIMD 2018) and scientific article was submitted for publication in Eastern-European Journal of Enterprise Technologies.

SOFTWARE-DEFINED NETWORKING, TRAFFIC ENGINEERING, DATA FORWARDING, DECISION MAKING THEORY