ABSTRACT

on master's thesis

on topic: <u>Analysis of efficiency of virtual machines and virtual containers technologies in cloud service systems.</u>

The explanatory note is made on 108 pages and includes 58 illustrations, and 16 sources by the list of references.

Due to the latest trends in information systems, an increasing number of services on the Internet are becoming cloudy. This means that services can be provided to users remotely, without the need to install server hardware in themselves. Virtualization technology can significantly improve the process of building cloud services, because it reduces the amount of physical equipment, the cost of purchasing and maintenance of which can be quite high. As the virtualization technology has already become widespread and there are several basic types, it raises the question of choosing the most suitable cloud service for effective operation. The two main types are hardware and container virtualization, which have both common and distinctive features, which allows you to use certain characteristics to ensure network reliability. Therefore, the choice of a suitable virtualization method when developing a cloud service is important.

The aim of the master's thesis is to analyze the characteristics of virtual machines and virtual containers, compare both technologies with each other, and configure the models of each of the types of virtual environments studied in Hyper-V and Docker systems. To achieve this goal, the following tasks are defined:

- To analyze virtualization technology;
- Conduct research on the architecture of virtual machines;
- Explore the architecture of virtual containers;

- Build virtual machine and container layouts and analyze the effectiveness of each of these solutions when building a cloud service.

The object of research is virtual server virtualization systems. The subject of the study is technology of hardware virtualization and technology of container virtualization.

Methods of research used in the master's thesis:

- Analysis of container and hardware virtualization technologies;
- Comparison of features of virtual machines and containers;
- Study the advantages and disadvantages of each type of virtualization
- Experimental construction of the layout of the cloud file-changer based on the Hyper-V virtual machine;
- Experimental layout design of a cloud file-changer based on the virtual container Docker;
- Comparison of the features of the layout work based on each type of virtualization.

The scientific novelty of the work is to conduct analysis of the technology of container and hardware virtualization as components in the deployment of cloud service, as well as comparison of both technologies in order to choose more efficient.

The results of the research, which are given in the master's thesis, can be used by companies in the construction of their own corporate cloud environment, in academic disciplines when considering the technologies of virtualization and cloud computing, as well as the Institute of Telecommunication Systems in the construction of its own cloud service.

The results of the research were published in two publications at the International Scientific and Technical Conference " Modern Challenges in Telecommunications " in 2017 and 2018:

Омельченко Р. Аналіз ефективності технології контейнерної віртуалізації / Є. Гордашник, Р. Омельченко. // Збірник тез одинадцятої міжнародної науково-технічної конференції "ПРОБЛЕМИ ТЕЛЕКОМУНІКАЦІЙ". – 2017. – P. 139–141.

Омельченко Р. Аналіз архітектурних особливостей віртуалізації та переваги віртуальних контейнерів / Л. Верес, Р. Омельченко. // Збірник тез дванадцятої міжнародної науково-технічної конференції "ПРОБЛЕМИ ТЕЛЕКОМУНІКАЦІЙ". – 2018. – Р. 116–118.