

SCENARIOS FOR IMPROVING CLOUD INFRASTRUCTURE PERFORMANCE THROUGH PHYSICAL AND LOGICAL SERVER CONFIGURATION

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The thesis is devoted to developing scenarios that are designed to improve the performance of cloud infrastructure, which is built using the principles of nested virtualization. The paper presents recommendations for the practical application of scenarios in the installation of different types of clouds.

In developing countries, the cloud service delivery model is based on the principles of nested virtualization [1-2]. Service providers, in order not to create their own physical infrastructure, buy ready-made solutions in the form of virtual superservers. These super servers are used as virtual data centres to provide various hosting services, etc. The degree of nesting has a direct impact on the performance of end-user virtualisation systems. Thus, the task of developing scenarios to improve the performance of cloud nested infrastructures is relevant.

As a result of the subject area analysis, the following performance influencing factors have been identified: connectivity of physical infrastructure components, type of virtualization and physical and logical architecture of the virtualization system.

A key factor is the physical architecture of the virtualisation system as a source of resources for the end-user. After analyzing the existing server chassis types, it can be seen that the best solution is to choose a Blade server. The main advantage of this scenario is: hot-swappable components, which increase fault-tolerance and reduce the time of service failure in case of hardware failure. To evaluate the hardware components are used the following software products: vCenter Performance Counters - performance counters, the graphs of which can be viewed through the vSphere Client. Information on these counters is available in the WEB version of the ESXTOP client - a utility that runs from the ESXi command line. It can be used to retrieve real-time performance counter values.

These tools allow you to create scenarios to improve the performance of your cloud infrastructure using nested virtualization. They show frequent problems in the organization of physical system components, such as insufficient CPU frequency, improper sizing of virtual machine cores, and imbalanced CPU usage by CPU on the server [3].

Another important factor that affects performance is the coherence of the logical structure of the virtual server. It depends on the placement of its

components, the organisation of data exchange [4], which can affect the speed of the structure as a whole.

The third factor, which requires the development of a separate set of scenarios, is the type of virtualisation. For example, when analysing the degree of nesting of virtual shells, the end user will experience minimal losses. There may be constraints in the form of operating system monotypes. In this case, a paravirtualised scenario would give slightly higher performance loss, while full virtualisation could introduce critical performance loss, which negatively affects the considered virtualisation server logical configuration scenario.

The report presents the results of the scenarios considered. Experimental studies were conducted in the teaching laboratories of the Department of Electronic Calculating Machines.

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