

ABSTRACT

Explanatory note size – 93 pages, contains 6 illustrations, 36 tables, 5 applications, 43 references.

Topicality. The adoption of cloud solutions has become an integral part of the software development cycle for many IT projects. It provides unmatched flexibility and convenience that are difficult to achieve using private infrastructure, accelerating software development and scaling. However, this advantage at the same time increases complexity in corresponding software development and deployment processes. Such complications lead to the creation of solutions to integrate cloud services with automation tools. Today, most of the existing automation tools implement integration with the cloud but require modifications to cloud infrastructure, such as installing agent software, which complicates both initial setup and maintenance. This highlights the need for an automation server that will allow the deployment of software development and deployment processes within cloud environments without requiring infrastructure changes while providing tools to adapt the server to meet user requirements.

The aim of the study. The main target is simplifying the deployment of software development and deployment automation processes in cloud environments.

The object of research: Software development and deployment automation processes.

The subject of research: Methods for automating software development using task orchestration in cloud environments.

To achieve this goal, the **following tasks** were formulated:

- analysis of existing servers and automation platforms;
- determination of methods for software tasks execution in the cloud;
- design of a scheme of automation server interaction with the cloud;
- integration of the automation server with container orchestration tools;
- analysis of the effectiveness of the proposed solution.

The scientific novelty of the results of the master's dissertation is a novel architectural approach for an automation server that proposes execution of tasks using a unidirectional interaction model with container orchestration tools, where the

automation server acts as the initiator. This approach, unlike analogs, does not require changes to the cloud infrastructure for its use.

The practical value of the obtained results is an automation server that implements software tools for deploying software development and deployment automation processes as software tasks in a cloud environment, with the capability for subsequent monitoring. The server employs a unidirectional interaction model with the cloud, achieved by using the native tools of container orchestrators, eliminating the need for agent software installation within the cloud infrastructure. This approach simplifies the integration of the automation server with the cloud and reduces computational resource usage. To adapt to user requirements, the automation server supports customizable plugins.

Relationship with working with scientific programs, plans, topics. Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

Approbation. The scientific provisions of the dissertation were tested at the Seventh international scientific and practical conference of young scientists and students "Software engineering and advanced information technologies" (Soft Tech-2024) – Kyiv.

Publications. The scientific provisions of the dissertation were published in:

- 1) Kinchur V., Stetsenko I. (2025) Automation Server Architecture for Task Orchestration in a Cloud Environment. Publish edition «Adaptive systems of automatic control. Inter-branch scientific and technological digest» 1(46), [Accepted for publication]. (category "B")

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