

## Cloud Ops: A New Approach to Cloud Development and Testing

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### ABSTRACT

CloudOps is cloud operations and it is used for identifying and defining appropriate or standards for IT services. It is very supportive to make the pipeline and optimizing cloud and IT operations. CloudOps provide network combinations, maintaining security, providing performance, proper device management, help desk, and some other tasks that are used by cloud applications and a variety of cloud operations. As per the various IT organizations or enterprise, this CloudOps uses DevOps principles of Continuous Integration (CI), Continuous Testing (CT), Continuous Deployment/Deployment (CD) for achieving targeted objective or better business process. Objective of this research is to understand how the DevOps and Cloud work together to achieve the businesses process and their transformation goals.

**Keywords:** DevOps, CloudOps, Cloud Development, Cloud Testing

### I INTRODUCTION

To take advantage of cloud platform for different services, we require to propose application so that they are decoupled from physical property. When we consider decoupled structural design especially in cloud for platform as a service and infrastructure as a service, perceive the effectiveness of the software development, deployment phases of an applications and consumption of the underlying cloud property. Cloud computing efficiency saves funds and time. DevOps, a classification of thinking with a primary concern for developing, deploying, and operating high-quality software. If we consider development, testing, deployment, and operations as a pipeline for the code to run through, then DevOps is about looking at that pipeline from a holistic perspective. The goal of looking at the pipeline holistically is

to search the ways to create it more efficient and generate higher quality products. This paper focuses on the benefit of using new approach cloud-based DevOps process and leverage services [1] [2].

Following the challenges with DevOps

- (a) Unpredictability across Development and Operation environments, Time constraints for frequent releases [1].
- (b) Slow deployment operation between development and testing environments, lower production for downstream teams [1].
- (c) Managing multiple application configurations and versions across servers [3].
- (d) High risk of fault due to high manual interventions [3].
- (e) High costs [4].

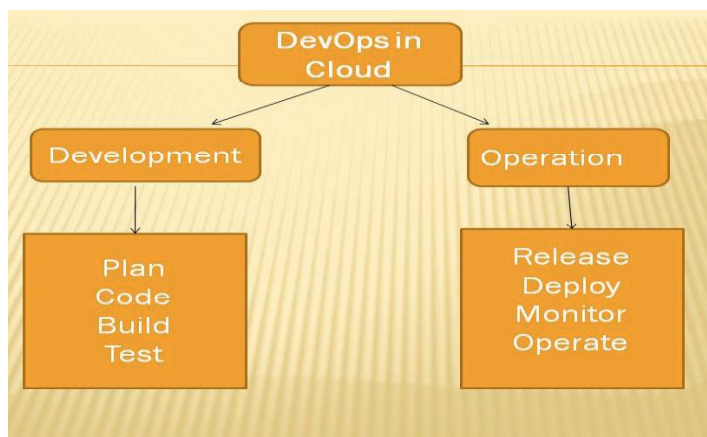


Fig. 1 Showing DevOps in Cloud

initial step for DevOps in cloud is continuous P&P (planning & preparation) that is bring all development team, operational team, testers team and business analysts at some common platform to prepare requirement and release the plan. Pipeline the requirements and under stratum all resource budget with strong focus on common strategy that may be reflective to the business objectives for DevOps. In

Continuous Integration (CI), Developer group has been addressed throughout DevOps lifecycle. Routine practice for integration procedure of developer's code may notice the errors quickly and can avoid failure of builds. Selection of correct tool and process that fit according to the requirements would be the main Continuous Planning (CP), Continuous Integration (CI), Continuous Testing (CT),

Continuous Deployment (CD) Continuous Feedback & Monitoring phases Challenge for CI. Merge the chooses tool in efficient way with different methodologies.

Continuous Testing (CT) consider one of the main aspects of development that ensures the product quality and customer satisfaction which deploy to the end-user. DevOps practice hub on automating all the kinds of testing and construct the appropriate testing environment for the development scenarios.

Continuous Testing defeat the challenge of this established testing. In the continuous process, the incidence of changes in software from development too hard to deployment is very recurrent. So, growth process is not the similar as was in past where software handoff from one team to another and centre was on increasing revenues for the corporation.

Continuous testing is a procedure of testing early, testing often, testing all over and automate. One of the challenges in CT is the location of heterogeneity, which will never reflect actual production environment and application structural design [5] [7].

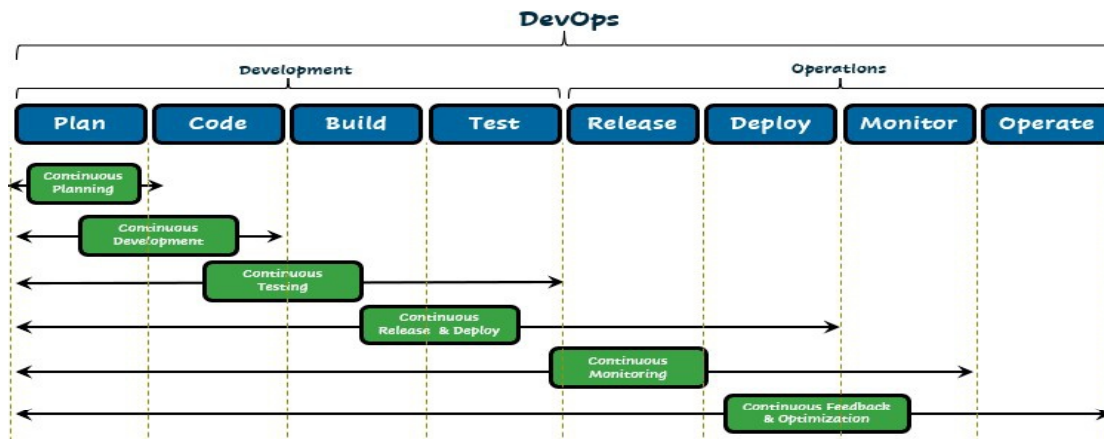


Fig. 2 Showing DevOps

In this regard, it restricts the DevOps adoption too. Therefore, we shouldn't consider DevOps are an implementation of asset of tools.

- Centralized tool orchestration that allows elimination of overlapping, expensive tools while maintaining service levels

Continuous Deployment (CD): Continuous deployment states that each change that occur, move through a pipeline of tests and if it qualifies/ passes all tests, it automatically gets deployed for in the production process. By that approach, software quality completely depends on the quality to test cases and suites because everything is automated in the whole process of deployment. The major benefit of CD is reduced lead time i.e., the time elapsed between prerequisite identification and its fulfilment. Figure 2: Process of Continuous Deployment followed by Continuous Delivery, which means software should always be discharge ready. Deployment Automation and Orchestration services include:

- Faster, Error-free and Automated Deployment
- Unique agentless architecture development
- Continuous deployment in single click
- Deploying in all environments with Single tool
- Integration of existing scripts
- Deployment metrics

Major issues similar to under stratum the needs, state DevOps procedure, stating equipment for growth & testing process, more focus on automating testing, organizational modify & implementation. To overcome these issues, we propose a new approach of using DevOps in cloud development and testing. DevOps consider as a progressive replica with considerable success in IT world. By automating end-to-end delivery, pipeline Collaboration, monitor, tool-chain pipelines, automation and Cloud adoption are leveraged by DevOps as a service to cloud applications.

Large enterprise and start-ups align their development and operations with the consultation of DevOps, so that high efficiency, faster time to market and better quality of software build with early on identification of emerging issues, letting the code be in a releasable state forever, can be achieved [8] [9] [10].

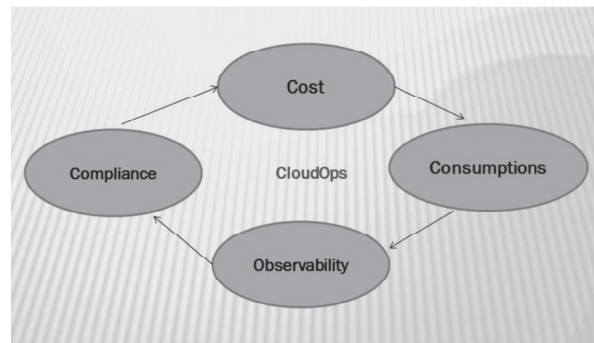


Fig. 3 Showing CloudOps

## II CLOUDOPS FRAMEWORK

Relationship among DevOps and Cloud Computing can be definite as to merge the centralization capacity of Cloud Computing that may offer automation of DevOps as testing, release and operation in centralized platform. When DevOps automation will turn into cloud-centric, most of the cloud computing either public or private supports DevOps systematically on the platform including the process of tools for Continuous Integration and Continuous Development. In addition, through tight integration, the price lowers down for DevOps automation technology and connect central governance with elastic control on DevOps process. CloudOps growth that process Cloud Development & Testing [11].

(a) **Technology stack normalization:** Initial step towards DevOps evolution adopt true agile method and apply proper version control so that continuous integration and delivery should be provided. Stack will be normalizing when redundant technologies are eliminated i.e. there should be a benchmark set of technologies in version control for practitioners.

(b) **Variability Standardize:** Development and Operation team make sure the technology for additional consolidation to single OS or OS family. procedure complexity and variability should be reduced with teamwork opportunities searching. Redesign the system configurations in version control and application to fit business needs.

(c) **DevOps practices expansion:** This stage is to eliminate the discrepancies created by previous changes and all foundational piece should be in place. For instance, outcomes from the group of application development should make sure the delivery for true efficiency.

(d) **Infrastructure delivery automation:** At this stage, discrepancies associated to development outputs and operations release times are omitted. Security and system configurations are automated after that in such a way it means DevOps team can give faster delivery and better service.

(e) **Self-service capabilities:** Provision of DevOps deployment at this stage testing environment is deployed by the developers and then success metrics would be shown and visible to the entire team.

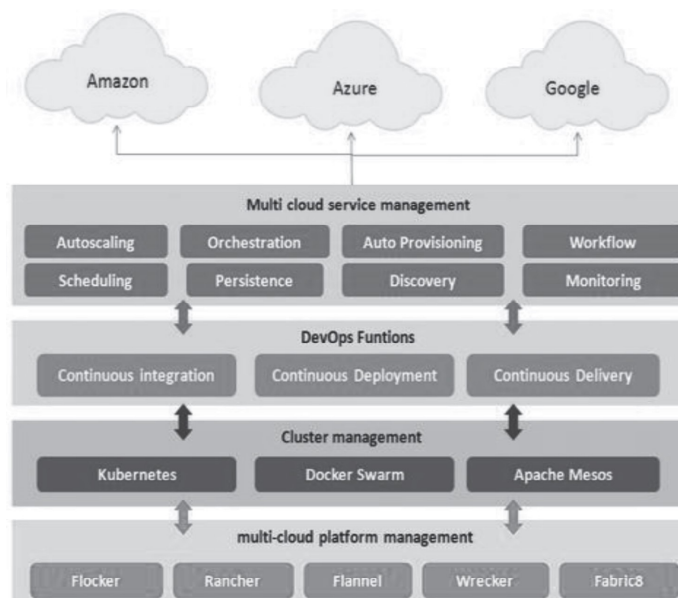


Fig.4 CloudOps Framework

Cloud-based platforms have following features [5] [8]:

- (i) **Able to expand.** We can scale out capacity at any time. Clouds let you self- or auto-provision servers. This feature adds a great deal of value but can be a challenge to manage.
- (ii) **Distributed and stateless.** Operations must adjust to management that could span the world.
- (iii) **Infrastructure pessimist.** Clouds can abstract the underlying infrastructure from the platforms and applications.
- (iv) **Location transparent.** We don't really care where the physical servers exist, but must manage them consistently.
- (v) **Latency tolerant.** Latency can vary a great deal, and able to operate and manage clouds using the same attributes.
- (vi) **Loosely coupled.** Clouds are able to run applications that share common services but aren't bound together.

- (vii) **Data that is shared, replicated, and distributed.** Data isn't centrally located and is either physically or logically separated.
- (viii) **Automated.** Much of the operations for clouds leverage a great deal of automation.
- (ix) **Self-healing.** Automation to fix common operational problems without affecting the applications or users.
- (x) **Dual active (or active/active).** This refers to how the cloud uses a network of independent processing nodes. Each node has access to a replicated database to give it access to and use of a single application.
- (xi) **Metered cost.** With usage-based accounting systems in place, those leveraging cloud resources have their cloud usage tracked. They can then allocate the costs accordingly, with show backs and chargebacks.

**Table 1**  
**Difference Between DevOps and CloudOps**

Points	Devops	CloudOps
<b>Key Process</b>	The key Process in DevOps is automation.	The key process in CloudOps is Services and the tools it offers.
<b>Storage</b>	Storage upgrade and expansion is a complex and expensive process.	It provides the option for storage expansion and enhances processing capabilities.
<b>Expertise</b>	Hiring a DevOps expert, any changes in software and infrastructure is expensive.	CloudOps is more efficient and requires less cost for maintaining network architecture.
<b>Focus</b>	Its focus on developing and launching the software solution.	It focuses on building and designing the cloud system
<b>The fundamental principle</b>	The fundamental principle of DevOps is to improve operational efficiency and agility.	The fundamental principle of CloudOps is to identify the process that can help in easing the IT service and applications.
<b>key integrations</b>	In DevOps, key integrations happen between Development and Operation	In CloudOps key integrations happens between Cloud and Operation

### III CONCLUSION

CloudOps enhanced the capability of DevOps and its services. Cloud computing platforms provide multiple benefits as compared to conventional IT communications. Using CloudOps in the combination with DevOps provides many advantages like speed, scalability, and efficiency. CloudOps is a latest Technique, which provides the worth to the businesses. DevOps ensure constant operations, heading the organizations to a simplified way of building and deploying software and their applications. In contrast, CloudOps is approach to migrate continues operations into the world of cloud computing. From a technical perspective, CloudOps offers a lot of rewards. CloudOps and DevOps together can improve the applications, infrastructure, processes, and most importantly, help out the people maintaining the forces.

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- [14] CloudOps: A New Approach to Cloud Development and Testing is the CloudOps emerging Technology and this paper is belonging to the future Technology in the theme of Engineering in Shodh Shikhar 2022.