DevOps CI Automation

Continuous Integration

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Abstract-

In the IT sector, DevOps is the trend. This is the procedure for tying the Development and Operations teams together. It will aid in the automatic completion of the SDLC and STLC processes.

This project aims to put the DevOps automation pipeline concept into practice. To achieve the purpose, a variety of methods and technologies are employed. The source codes are stored in GIT hub, and the Continuous Integration process is handled by Jenkins. Web applications are written in Java and stored in a GIT repository. Similarly, for the purpose of test automation a test framework is created and is stored in a separate GIT repository. Selenium is the powerful tool for Test Automation and TestNG add more flavors into it. Jenkins automatically creates a build whenever any new test is added/updated or commit is made in to GIT. The automation tests are then executed.

*Keywords—DevOps; GitHub; Jenkins; styling; frame work; CI/CD; Maven;*

I. INTRODUCTION

DevOps, is the new and updated method of software development life cycle. It will not the same as the traditional model like waterfall or V-V. By the help of DevOps, both development and operation are able to deliver defect free and smooth applications to the end users.

DevOps is a combination of Development and Operation tasks. To make it very clear it is the key concept of Continuous Integration and Continuous Deployment. Test Automation play a vital role in the CI/CD pipeline. Since everything is automated here, once any new change is implemented by any developer, the same will be tested automatically and deployed in higher environments if all required test cases are passed. Hence, this is the wonderful approach for software development and testing in the current IT market.

II. SIGNIFICANCE

The ideas of CI Automation in DevOps follow the agile practice. It helps to refine the complete STLC life cycle in an automated fashion.[5]. This is how a lot of bugs are identified prior to release of any application to production environment. Naturally, this CI and CD methodology help to both development & test team, and operation team in a project.
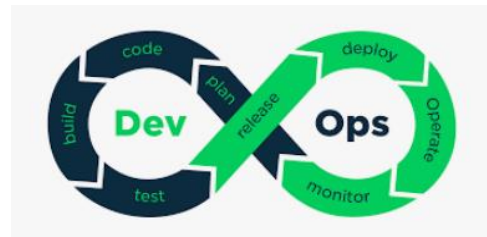
III. RESEARCH METHODOLOGY

DevOps is recent and updated methodology in current IT industry which aimed at bringing both software development teams and operation teams together to improve work throughout the software development lifecycle (SDLC) and Software Testing Life Cycle(STLC)[1].

CI/CD is the fashion for delivering application to end users more frequently by incorporating automation testing into the app development process[9].

Continuous Integration (CI) automation is the key factor of the Test Framework in DevOps environment.

Target folder is automatically created and the necessary reports are generated at the end of the execution. This report can be shared with other stakeholders of the project.

IV. LITRETURE SURVEY

F. Leymann, V. Andrikopoulos, and J. Wettinger,[1]. DevOps is the new way of software development life cycle. This helps both Dev and Test team to deliver a defect free product within time and zero defect. The concept of containerization also adds a lot of value to the new era of software development. Instead of waiting for the deployment team, now a days, everything is automated fully. Hence, testing is also implemented in an automated way so that if all testes pass, auto deployment will happen in higher environments.

S. Latkowski, D. Pustakhod, M. Chatzimichailidis, W. Yao and X. J. M. Leijtens,[2[Testing in DevOps plays a vital role. Specifically Test Automation is the key point in any DevOps model. Since DevOps is the conceptual framework for both Dev team and Ops team, Test automation comes inside the Dev team in order to provide a defect free delivery at the end. As a result, the end users will not face any issues or failures in production environment.

F. Zampetti, S. Geremia, G. Bavota and M.Di Penta, "CI/CD Pipelines Evolution and Restructuring: Continuous Integration and Continuous Delivery is the new method of software integration with the existing repo. Usually, developers push their changes into a repository such as Git hub, Bit bucket, SVN, VSS, AWS Code Commit etc. Since the work culture is now distributed in nature, each commit from different developers is stored in the repo in a distributed fashion. As a result, dependency is minimized in order to push the code into a release/master branch of the repo. Since Test Automation plays a vital role to identify the test failures in any new code, Continuous Integration (CI) provides the way to find out the regression issues from existing test cases as well which helps preventing defect leakage to production environment. Deployment in any higher instance is completely depends upon the test cases result. If all test pass, automatically the branch will be deployed in the higher environment. This is why we can call the full process as the CI/CD pipeline. In market, Jenkins, Bamboo, AWS Code Pipeline etc. tools are used in order to achieve the CI/CD. Normally CI/CD is the key concept in DevOps methodology.

V. CONCLUSION ANS FUTURE SCOPE

DevOps is the new way of working in current era. CI/CD is the key concept of DevOps. When DevOps joins hand with test automation it will be a fully-fledged automated system.

DevOps is a fantastic tool for businesses. It establishes a smooth path for Continuous Development and Continuous Integration. It helps to bridge the gap between developers' demand for change and operations' resistance to change in every project.

All the IT giants like Netflix, Amazon, Etsy and Google used to use this approach successfully. It's not limited to any specific industry. Mostly all the industries like Healthcare, Finance, Mining, Banking, Insurance etc. are using CI/CD automation frequently to update the delivery and test automation process

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