UPM Continuous Integration and Version Control

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UPM 24.x

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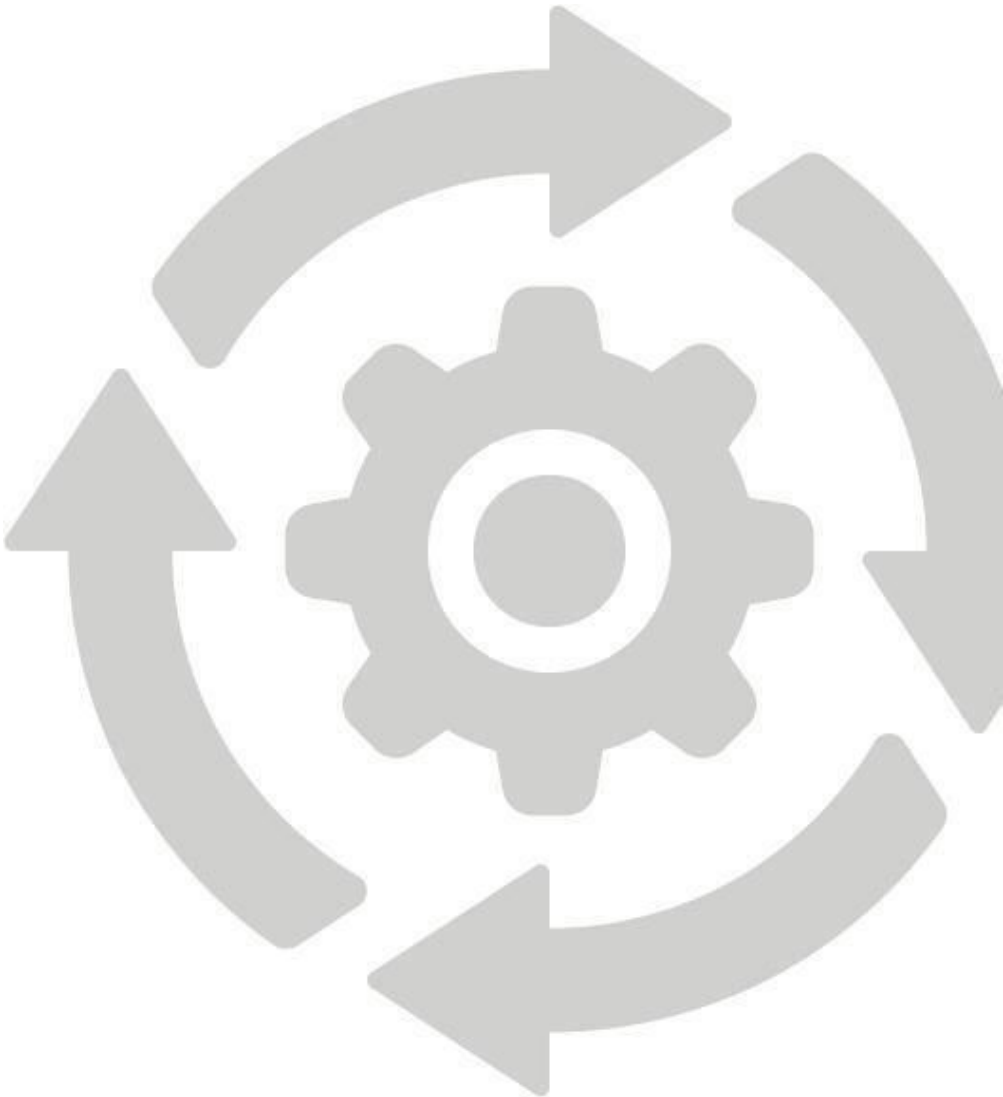

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Introduction

Continuous Integration is a development practice inducted by ZINFI that ensures that a build and subsequent testing is conducted for every code change made to ZINFI's UPM. This concept was meant to remove the problem of finding the late occurrences of issues in the build lifecycle. Instead of the developers working in isolation and not integrating enough, continuous integration was introduced to ensure that the code changes and builds were never done in isolation.

Version control systems, also known as source control, source code management systems, are a mechanism for managing multiple versions of source files, so that even with a modification of a source file, access to previous revisions are retained. By storing all the UPM information in source control, it becomes easier to re-create the testing and production environments that UPM runs on. This include configuration information for your application's software stack that comprise the environment. The objective is to have everything that can possibly change at any point in the life of the project stored in a controlled manner. This allows us to recover an exact snapshot of the state of the entire system, from development environment to production environment, at any point in the project's history.

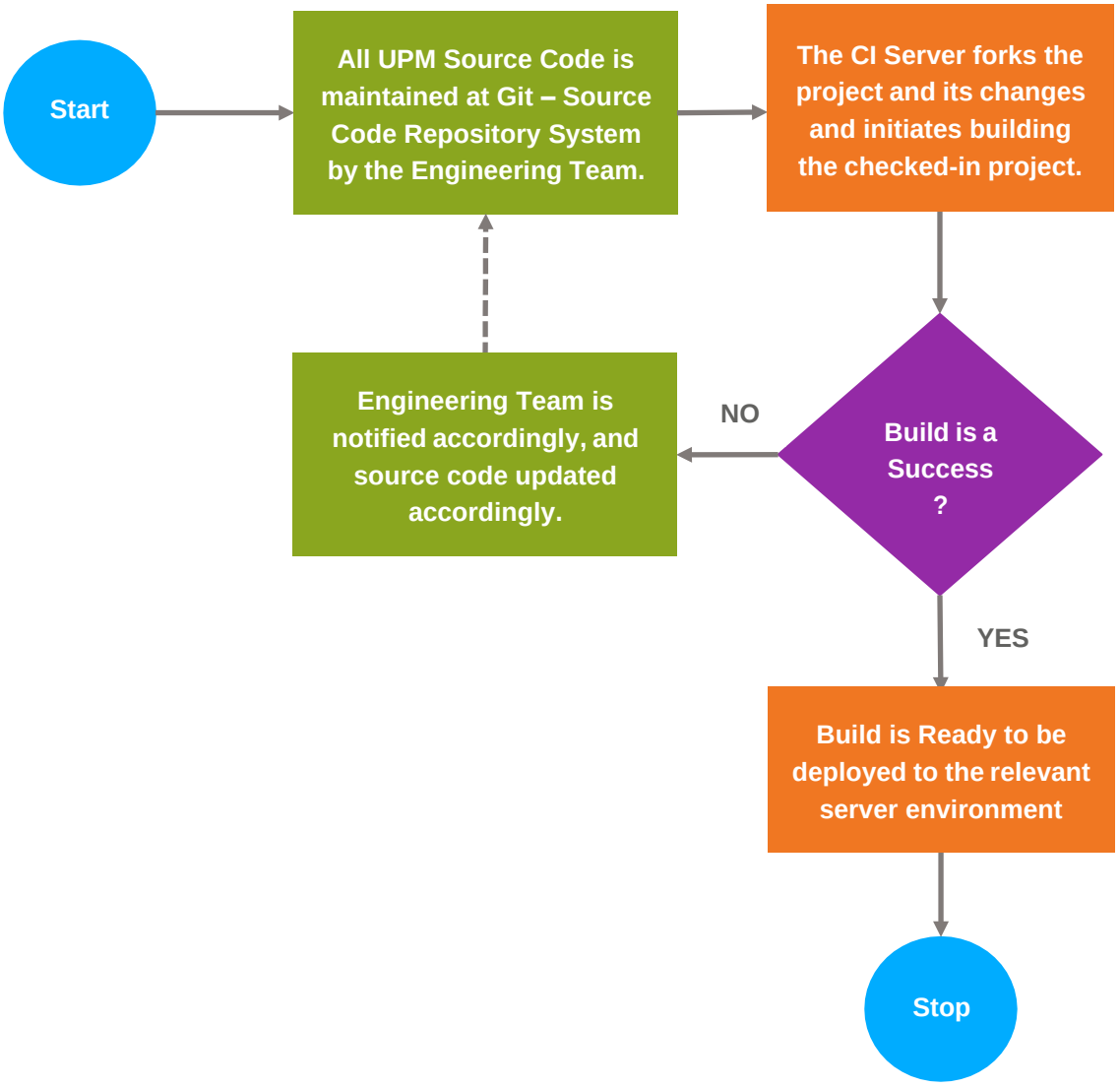
Continuous Integration

Continuous integration has become a very integral part of our software development process. It assists us to build and test projects continuously in order to integrate changes to the project as quickly as possible and obtain fresh builds.

At ZINFI, Continuous Integration is practiced through the usage of Microsoft Azure DevOps. Azure DevOps presents a simplified process for creating a continuous integration (CI) process.

Workflow

The following image shows a quick workflow of how the entire Continuous Integration workflow works in our UPM development projects:



Based on the above workflow, this is generally how the continuous integration process works.

- First, a developer commits the code to the version control repository. Meanwhile, the Continuous Integration server on the integration build machine polls source code repository for changes.
- After all commit occurs, the Continuous Integration server is allowed to detect the changes in the version control repository, retrieve the latest copy of the code from the repository and executes a build script, which integrates the software.
- The Continuous Integration server generates feedback by e-mailing build results to the specified project members. If the Build is a failure, source code is updated to rebuilt.

- Build being a success, is ready to be deployed to first in development server and then in the testing, staging or production server.
- The Continuous Integration server continues to poll for changes in the version control repository and the whole process repeats.

Version Control

Git is utilized as a versioning control system for UPM. The following are controlled through Git:

- Master Branch for Quarterly Release – Development Server for ZINFI main product release
- Feature Branch – For developing any feature and will be pushed to master when it is completed. Commit from feature branch to master is done on a regular basis.
- Customer Specific Monthly Release – Customer Specific Branch is successfully released then it is merged into master branch
- Hotfix – it is managed based on tag of releases of customer or master branch.

The branching structure maintained through Git, is defined through the following diagram: