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Build Automation in DevOps Study Guide

This chapter explores the concept of build automation in DevOps and its benefits for software quality and consistency.

What is Build Automation?

Build automation refers to the process of automating the steps involved in preparing software for deployment. Traditionally, these steps might include compiling source code, packaging files, and creating installers. By automating these tasks, DevOps aims to achieve greater efficiency and consistency in the software development lifecycle.

Why Use Build Automation?

There are several advantages to using build automation in DevOps:

- **Reduced Errors:** Manual build processes are prone to human error. Automation eliminates these inconsistencies and ensures the build process is performed identically every time.
- **Improved Consistency:** An automated build process guarantees that the software is built using the same steps in the same order every time. This consistency minimizes variations that could introduce bugs.
- **Faster Feedback Loops:** With automated builds, developers receive immediate feedback on any errors or issues identified during the build process. This allows them to fix problems quickly and efficiently.
- **Reduced Manual Work:** Automation frees up developers from repetitive build tasks, allowing them to focus on more creative aspects of software development.

How Build Automation Works

- **Separate Build Environment:** The build process is separated from the development environment (IDE) used by developers to write code. This separation ensures consistency and avoids conflicts.
- **Scripted Build Steps:** The build process is defined as a series of scripts that automate tasks like compiling code, packaging files, and running tests.

- **Continuous Integration:** Build automation often works in conjunction with continuous integration (CI). As changes are made to the codebase, they trigger an automated build process, allowing for early detection of integration issues.

Build Automation Tools

There are several popular tools available for build automation, including:

- **Jenkins:** An open-source automation server widely used for continuous integration and build automation.
- **Maven:** A project management and build automation tool primarily used for Java projects.
- **Gradle:** A flexible build automation tool that can be used for various programming languages.
- **Bamboo:** A commercial build and deployment automation platform from Atlassian.

The choice of tool depends on the specific needs of the project and the programming languages used.

*See slides below:

Build Automation



- Compiling source files
- Packaging into compressed formats
- Producing installers
- Creating or updating of database
- Supports Continuous Integration

Automation Benefits



- Eliminating variation, human error, and defects

- Requires thorough documentation and understanding of the target environment and dependencies



Jenkins
Maven
Gradle
Bamboo
And more...