CI/CD using Jenkins and GIT (4 Days)

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DevOps Fundamentals

- Why DevOps
- What is DevOps?
- Collaborative, Matrixed and Cross-Functional Teams
- Key Components of Successful DevOps Teams
- DevOps-ification
- DevOps Vocabulary
- DevOps Goals
- Not DevOps - Crush Buzzwords
- Driving Business Outcomes with DevOps
- Technology-Enabled Business
- DevOps Key Enabler for Digital Transformation
- Core Values and Mission
- Core Values - Culture
- Core Values - Automation
- Core Values - Measurement
- Core Values - Sharing
- Communication
- Collaboration
- Value Stream Mapping
- Behavioral Patterns for Success
- DevOps Org Structures
- DevOps Team - Separate
- DevOps Merged Organization
- DevOps Overlapped Organization
- Organizational Structure Leadership
- What Does Continuous Delivery Mean?
- Deployment Pipelines
- Your Organization is Doing CD if ...
- Pipelining for CD
- Continuous Integration
- CI Pipeline
- CD & CI Methodologies
- Key Tool Categories for CI/CD

Introduction to Git

- What is Git
- Git's Design Goals
- Git's Design Goals (cont'd)
- Branching and Merging

- Branching and Merging (cont'd)
- Centralized Version Control
- Distributed Version Control
- Git Basics
- Git Basics (Cont'd)
- Git Basics (cont'd)
- Getting Git
- Git on the Server
- Git Repository Managers
- Git on Somebody Else's Server
- Summary

Basic Git Operations

- Using Git
- Definitions
- Repository (cont'd)
- Commit
- How to Think About Commits
- Viewing History
- Configuring Git
- Configuration Scope
- User Identification
- User Identification (cont'd)
- GPG Signing
- Gnu Privacy Guard
- GPG Basics
- GPG and Git
- .gitignore
- Other Useful Configurations
- Summary

Branching, Merging and Remotes

- Branching
- Branches in Git
- Branches in Git (cont'd)
- Merge
- Merge (cont'd)
- Fast Forward Merge
- --no-ff
- More Than One Repository
- Working with Remotes
- Fetch and Pull
- Push
- Pull Requests

- Tagging a Commit
- Lightweight Tags
- Annotated Tags
- Sharing Tags
- Checking Out a Tag
- Summary

Introduction to Git Flow

- Why Use an SCM Workflow?
- Why Use an SCM Workflow? (Cond.)
- What is Git Flow
- Benefits
- How Git Flow works?
- How Git Flow works? (Contd.)
- What is Git Flow? (Contd.)
- How Git Flow works? (Contd.)
- Git Flow Extension
- Initializing Git Flow
- Features
- Release
- Hotfixes
- Git Flow and Continuous Integration
- Git Flow – Summary
- Git Flow – Pros and Cons
- Git Flow – When it Works Best?
- Git Flow – When it Doesn’t Work?
- Git Flow Alternatives
- Trunk-based Development
- Trunk-based Development (Contd.)
- Trunk-based Development – When it Works?
- Trunk-based Development – When it Doesn’t Work?
- GitHub Flow
- GitHub Flow – Pros and Cons
- GitLab Flow
- GitLab Flow – Environment Branches
- GitLab Flow – Release Branches
- GitLab Flow – Release Branches (Contd.)
- GitLab Flow – Pros and Cons

Introduction to Continuous Integration, Continuous Delivery and Jenkins-CI

- Foundation of Agile AppDev

- XP Flow
- Extreme Programming
- Agile Development
- What is Continuous Integration
- What is Continuous Integration (cont'd)
- Typical Setup for Continuous Integration
- Setup Notes for Continuous Integration
- CI with Artifact Management
- What is Continuous Delivery?
- Why Continuous Delivery?
- DevOps and Continuous Delivery
- Continuous Delivery Challenges
- Continuous Delivery vs Continuous Deployment
- Jenkins Continuous Integration
- Jenkins Features
- Running Jenkins
- Summary

Introduction to Apache Maven

- Build Tools for Java
- Build Tools for Java (cont'd)
- History of Build Tools
- Traditional Scripting
- 'make'
- Problems with Make
- Manual Build with JavaC
- ANT
- Pros and Cons of Ant
- Apache Maven
- Goals of Maven
- What is Apache Maven?
- What is Apache Maven (cont'd)
- Why Use Apache Maven?
- The Maven EcoSystem
- Consistent Easy-to-Understand Project Layout
- Convention Over Configuration
- Maven is Different
- Maven Projects have a Standardized Build
- Effect of Convention Over Configuration
- Importance of Plugins
- A Key Point on Maven!
- Summary – Key Features of Maven

Installing and Running Apache Maven

- Downloading Maven
- Installing Maven
- Run From Command Line
- Running Inside an IDE
- Settings.xml
- Local Repository
- Summary

Installing and Running Jenkins

- Downloading and Installing Jenkins
- Running Jenkins as a Stand-Alone Application
- Running Jenkins as a Stand-Alone Application (cont'd)
- Running Jenkins on an Application Server
- The Jenkins Home Folder
- Installing Jenkins as a Windows Service
- Initial Configuration
- Configuration Wizard
- Configuration Wizard (cont'd)
- Configuring Tools
- Configuring Tools - Best Practices
- Logging in Jenkins
- Custom Log Recorders

Job Types in Jenkins

- Introduction
- Different types of Jenkins Items
- Different types of Jenkins Items (cont'd)
- Configuring Source Code Management(SCM)
- Working with Subversion
- Working with Subversion (cont'd)
- Working with Git
- Storing Credentials
- Service Accounts
- Storing Credentials (cont'd)
- Build Triggers
- Schedule Build Jobs
- Polling the SCM
- Polling vs Triggers
- Maven Build Steps
- Summary

Jenkins Plugins

- Introduction
- Jenkins Plugins - SCM
- Jenkins Plugins – Build and Test
- Jenkins Plugins – Analyzers
- Jenkins for Teams
- Installing Jenkins Plugins
- Summary

Securing Jenkins

- Jenkins Security - Overview
- Jenkins Security
- Authentication
- Authorization
- Confidentiality
- Activating Security
- Configure Authentication
- Using Jenkins's Internal User Database
- Creating Users
- Authorization
- Matrix-Based Security
- Note – Create the Administrative User
- Project-based Matrix Authorization
- Project-Based Authentication
- Role Based Access Control
- Conclusion

Distributed Builds with Jenkins

- Distributed Builds - Overview
- Distributed Builds – How?
- Agent Machines
- Configure Jenkins Master
- Configure Projects
- Conclusion

Continuous Delivery and the Jenkins Pipeline

- Continuous Delivery
- Continuous Delivery (cont'd)
- DevOps and Continuous Delivery

- Continuous Delivery Challenges
- Continuous Delivery with Jenkins
- The Pipeline Plugin
- The Pipeline Plugin (cont'd)
- Defining a Pipeline
- A Pipeline Example
- Pipeline Example (cont'd)
- Parallel Execution
- Creating a Pipeline
- Invoking the Pipeline
- Interacting with the Pipeline
- Pipeline vs Traditional Jobs
- Conclusion

Best Practices for Jenkins

- Best Practices - Secure Jenkins
- Best Practices - Users
- Best Practices - Backups
- Best Practices - Reproducible Builds
- Best Practices - Testing and Reports
- Best Practices - Large Systems
- Best Practices - Distributed Jenkins
- Best Practices - Summary