

Course duration

- 2 days

Course Benefits

- Install and configure Jenkins in a servlet container
- Create Jenkins builds
- Configure and use Apache Ant and Apache Maven with Jenkins
- Use Jenkins to generate Java coding standards reports, code coverage reports, and change notices
- Use Jenkins to automatically deploy software into a testing environment.

Course Outline

1. Introduction to Continuous Integration, Continuous Delivery and Jenkins-CI
 1. Foundation of Agile AppDev
 2. XP Flow
 3. Extreme Programming
 4. Agile Development
 5. What is Continuous Integration
 6. Typical Setup for Continuous Integration
 7. Setup Notes for Continuous Integration
 8. CI with Artifact Management
 9. What is Continuous Delivery?
 10. Why Continuous Delivery?
 11. DevOps and Continuous Delivery
 12. Continuous Delivery Challenges
 13. Continuous Delivery vs Continuous Deployment
 14. Jenkins Continuous Integration
 15. Jenkins Features
 16. Running Jenkins
 17. Summary
2. Installing and Running Jenkins
 1. Downloading and Installing Jenkins
 2. Running Jenkins as a Stand-Alone Application
 3. Running Jenkins on an Application Server
 4. The Jenkins Home Folder
 5. Installing Jenkins as a Windows Service
 6. Initial Configuration
 7. Configuration Wizard
 8. Configuring Tools

9. Configuring Tools - Best Practices
10. Logging in Jenkins
11. Custom Log Recorders
12. Summary
3. Job Types in Jenkins
 1. Introduction
 2. Different types of Jenkins Items
 3. Configuring Source Code Management(SCM)
 4. Working with Subversion
 5. Working with Git
 6. Storing Credentials
 7. Service Accounts
 8. Build Triggers
 9. Schedule Build Jobs
 10. Polling the SCM
 11. Polling vs Triggers
 12. Maven Build Steps
 13. Summary
4. Advanced Jobs
 1. Parameterized Jobs
 2. Built-in Environment Variables
 3. Parameter Types
 4. Defining Parameters
 5. Using Parameters / Environment Variables
 6. Parameters in the config.xml File
 7. Launching a Build with Parameters
 8. Configuration Matrix
 9. Configuration Matrix - Example
 10. Defining Configuration Matrix
 11. Monitoring External Jobs
 12. Summary
5. Non-Java Jenkins Jobs
 1. Jenkins Jobs
 2. Non-Java Jobs
 3. Building .NET Projects with Jenkins
 4. Installing MSTest Plugin in Jenkins
 5. Configuring the MSBuild Plugin
 6. Creating a Jenkins Job and Specify a Build Step
 7. Specifying a Step for Running Unit Tests
 8. Adding a Step for Deploying the .NET Project
 9. Building a Node.js Application with Jenkins
 10. Node.js Plugin
 11. Provides direct Pipeline supportBuilding a C++ Project with Jenkins
 12. Executing PowerShell Scripts with Jenkins
 13. Summary
6. Template Jobs
 1. Template Jobs

2. Template Jobs (Contd.)
3. Template Jobs Plugin
4. Template Jobs Plugin - config.xml
5. Summary
7. Continuous Delivery and the Jenkins Pipeline
 1. Continuous Delivery
 2. DevOps and Continuous Delivery
 3. Continuous Delivery Challenges
 4. Continuous Delivery with Jenkins
 5. The Pipeline Plugin
 6. Defining a Pipeline
 7. A Pipeline Example
 8. Parallel Execution
 9. Creating a Pipeline
 10. Invoking the Pipeline
 11. Interacting with the Pipeline
 12. Pipeline vs Traditional Jobs
 13. Conclusion
8. Groovy DSL
 1. What is Groovy
 2. Groovy in Jenkins
 3. Comments in Groovy
 4. Data Types
 5. Identifiers
 6. Variables
 7. def
 8. String Interpolation
 9. Operators
 10. Ranges
 11. Conditional Statements
 12. Loops
 13. Lists
 14. Maps
 15. Exception Handling
 16. Methods
 17. Closures
 18. this Keyword
 19. Classes
 20. Static Methods
 21. Inheritance
 22. Abstract Classes
 23. Interfaces
 24. Generics
 25. Jenkins Script Console
 26. Extending with Shared Libraries
 27. Directory Structure
 28. Sample Groovy Code

29. Defining Shared Libraries
30. Using Shared Libraries
31. Same Shared Library Usage Code
32. Defining Global Variables
33. Summary
9. Securing Jenkins
 1. Jenkins Security - Overview
 2. Jenkins Security
 3. Authentication
 4. Authorization
 5. Confidentiality
 6. Activating Security
 7. Configure Authentication
 8. Using Jenkins's Internal User Database
 9. Creating Users
 10. Authorization
 11. Matrix-Based Security
 12. Note - Create the Administrative User
 13. Project-based Matrix Authorization
 14. Project-Based Authentication
 15. Role Based Access Control
 16. Conclusion
10. Jenkins Plugins
 1. Introduction
 2. Jenkins Plugins - SCM
 3. Jenkins Plugins - Build and Test
 4. Jenkins Plugins - Analyzers
 5. Jenkins for Teams
 6. Installing Jenkins Plugins
 7. Summary
11. Distributed Builds with Jenkins
 1. Distributed Builds - Overview
 2. Distributed Builds - How?
 3. Agent Machines
 4. Configure Jenkins Master
 5. Configure Projects
 6. Conclusion
12. Containerized Builds
 1. Introduction to Docker
 2. Docker - Benefits
 3. Containers vs. Virtual Machines
 4. Running Jenkins in a Docker Container
 5. Delete Jenkins Container and Image
 6. Configuring Command Prompt to Connect to Docker
 7. Creating Docker Container from Jenkins Job
 8. Test Custom Image Created by a Jenkins Job
 9. The Jenkins Docker Build Step Plugin

10. Ephemeral Build Agents
11. Summary
13. The Jenkins API
 1. Remote Access API
 2. What you can do with the Jenkins Remote API
 3. Remote API and CSRF Protection - API Token
 4. Remote API and CSRF Protection - Crumb
 5. Configure Jobs to Support the Jenkins Remote API
 6. Making Remote API Calls
 7. Example - Advanced REST Client
 8. Example - cURL
 9. Jenkins CLI
 10. Configure Jenkins to use CLI
 11. Download and Use Jenkins CLI
 12. Summary
14. Scripting
 1. Introduction to Scripting
 2. Benefits of Scripting
 3. The Jenkins Script Console
 4. Calling Scripts using cURL
 5. Sample Scripts
 6. Calling Groovy Scripts from a Jenkins Job
 7. Jenkins API
 8. Summary
15. User Interface Options
 1. User Interface Options
 2. Customizing the UI with CSS
 3. The User Content Folder
 4. Using the User Content Folder and Simple Theme Plugin
 5. Writing a Jenkins Plugin
 6. Modify settings.xml
 7. Generate Boilerplate Code for Custom Jenkins Plugin
 8. Modify pom.xml
 9. Package and Deploy the Plugin
 10. The Blue Ocean Plugin
 11. Blue Ocean Plugin Features
 12. New modern user experience
 13. Advanced Pipeline visualizations with built-in failure diagnosis
 14. Branch and Pull Request awareness
 15. Personalized View
 16. Summary
16. Best Practices for Jenkins
 1. Best Practices - Secure Jenkins
 2. Best Practices - Users
 3. Best Practices - Backups
 4. Best Practices - Reproducible Builds
 5. Best Practices - Testing and Reports

6. Best Practices - Large Systems
7. Best Practices - Distributed Jenkins
8. Best Practices - Summary

Class Materials

Each student will receive a comprehensive set of materials, including course notes and all the class examples.

Class Prerequisites

Experience in the following *is required* for this Jenkins class:

- Familiarity with Java development practices.