Training: Capstone Courseware
117 Introduction to Spring

TRAINING GOALS:

This course enables the experienced **Java developer** to use the **Spring application framework** to manage objects in a lightweight "IoC" (inversion-of-control) container. Spring is a far-reaching framework that aims to facilitate all sorts of Java development, including every level of multi-tier distributed systems. Here we focus on the "Core" module of the framework, developing facility in instantiating, configuring, and assembling Spring beans for various purposes.

The Core module gives the developer declarative control over object creation and assembly; this is useful for any tier of any Java application, and so this material also forms the basis for other Spring courses on persistence, web applications, and REST web services.

Learning Objectives

- Understand the scope, purpose, and architecture of Spring.
- Use Spring application contexts to declare application components, rather than hard-coding their states and lifecycles.
- Use dependency injection to further control object relationships from outside the Java code base.
- Use annotations to take advantage of Spring post-processors for automated bean instantiation and wiring.
- Configure systems of Spring beans using either **Java** or **XML**

CONSPECT:

- Overview of Spring
  - Java EE: The Good, The Bad, and the Ugly
  - Enter the Framework
  - Spring Value Proposition
  - The Spring Container
  - Web Applications
  - Persistence Support
  - Aspect-Oriented Programming
  - The Java EE Module(s)
- The Container

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- JavaBeans, Reconsidered
- The Factory Pattern
- Inversion of Control
- XML View: Declaring Beans
- Java View: Using Beans
- Singletons and Prototypes

- Instantiation and Configuration
  - Configuring Through Properties
  - Configuration Namespaces
  - The p: Notation
  - Bean (Configuration) Inheritance
  - Configuring Through Constructors
  - Bean Post-Processors
  - Lifecycle Hooks
  - Integrating Existing Factory Code
  - Awareness Interfaces
- Dependency Injection
  - Assembling Object Graphs
  - Dependency Injection
  - Single and Multiple Relationships
  - The Utility Schema
  - Using Spring Expression Language (SpEL)
  - Inner Beans
  - Autowiring
  - @Component, @Service, & Company
  - @Autowired Properties
  - Best Practices with Spring Annotations
  - Java Classes as @Configurations
  - AnnotationConfigApplicationContext
  - Capabilities and Limitations
  - Mixing and Importing XML and Java Configurations
- Assembling Object Models
  - Collections and Maps
  - Support for Generics
  - The Spring Utility Schema (util:)
  - Autowiring to Multiple Beans

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- Order of Instantiation
- Bean Factory vs. Application Context

REQUIREMENTS:

- **Java programming** -- Course 103 is excellent preparation.
- Basic knowledge of XML -- Course 501 **Introduction to XML**.

Difficulty level

CERTIFICATE:

The participants will obtain certificates signed by Capstone Courseware.

TRAINER:

Authorized Capstone Courseware Trainer.

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