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Overview of Spring Technology
- Shortcomings of Java EE, Spring Architecture

Spring Introduction
- Managing Beans, The Spring Container, IoC, DI
- Configuration Metadata – XML, @Component, Auto-Detecting Beans

Dependencies and Dependency Injection (DI)
- Dependency Inversion, Dependency Injection (DI) in Spring, DI Configuration – XML, @Resource

Working with Bean Properties
- Configuring Value Properties, Property Conversions, Setter / Constructor Injection

Spring Expression Language for Configuration
- Configuring and using lists, sets, etc.

Additional Capabilities
- Factory Methods, Bean Aliases, Definition Inheritance (Parent Beans)

The Spring Container and API
- ApplicationContext
- ClassPathXmlApplicationContext, FileSystemXmlApplicationContext, Constructors, Usage
• Resource Access – Overview, Resource Implementations
• Validation
• Overview, JSR-303
• Declarative Validation, @NotNull, @Size, @Min, etc
  Configuration, Injection
• Bean Scope and Lifecycle
• Bean Scope Defined, Configuring, Inner Beans, Bean Creation
  Lifecycle, Lifecycle Callbacks

**BeanPostProcessor, Event Handling**
• MessageSources
• Defining and Using Resource Bundles, Localization/I18N

**Annotation Driven Configuration**

Stereotypes: @Component, @Service, @Controller, @Repository
Java EE 5 Annotation Support
Defining Custom Annotations
Autowiring
Java Based Bean Metadata (JavaConfig)
Overview – code-centric Configuration
@Configuration, @Bean, and @Value
Importing and @Import
• Autowiring in Configuration Classes
• Mixing XML Configuration and @Configuration
• XML vs Annotation Based Configuration
• Other Capabilities
• SpEL – Spring Expression Language
• Validation

**Database Access with Spring**

• Issues with JDBC / Typical JDBC Flow
• Introduction to Spring DAO Support
• Spring Database API, (Simple)JdbcTemplate, (Simple)JdbcTemplate, DataSources,
• Working With and Configuring, <list>, <set>, With Bean Refs, <map>, <props>
• Queries and Inserts
• RowMapper, ParameterizedRowMapper, Passing Arguments, queryForObject, query, update
• Additional API Capabilities
• Additional query methods, Passing Type Arguments, queryForList, FetchSize, MaxRows
• Using Spring with Hibernate
• Overview of Template Approach, SessionFactory configuration
• Using Contextual Sessions
• Using Spring with JPA
• LocalEntityManagerFactoryBean,
  LocalContainerEntityManagerFactoryBean,
  JNDI,PersistenceUnitManager
• DAO Support – @PersistenceUnit, @PersistenceContext

**Aspect Oriented Programming (AOP)**

• Overview of AOP
• AOP Basics, Aspect, Joinpoint, Advice, Pointcut
• Introduction to Spring AOP
• Capabilities, Configuration (Annotation Based and XML),
  Weaving, Joinpoints
• Using Aspects
• Defining Advice, Configuring Pointcuts, Targets and Proxies
• XML Configuration with <aop:>

**AspectJ Pointcuts, Autoproxies**

• Using @AspectJ Annotations
Spring Transaction (TX) Management
- Intro to Spring Transaction Management
- Overview, Component TX Model, TX Propagation, Declarative Transactions, TransactionManagers
- Using Spring Transactions
- Annotation Configured Transactions
- @Transactional and its settings
- XML Configured Transactions
- new <tx:*> elements, Configuring tx:advice, and tx:attributes
- Defining the TX advisor

Introduction to Spring Web Integration and Spring MVC
- Integrating Spring with Java EE Web Apps, ContextLoaderListener, WebApplicationContext
- Spring Web MVC Overview, Capabilities, Architecture
- Spring MVC Basics
- DispatcherServlet, Configuration, mvc Namespace
- Controllers, @Controller, Handler Methods
- @RequestParam and Parameter Binding
- View Resolvers
- Writing Controllers, @Controller, @RequestMapping, @RequestParam, @PathVariable
- Forms and Binding, Spring Form Tags, @ModelAttribute
Overview of Spring Security

- Overview – Capabilities, Architecture
- Introduction to Spring Security
- HTTP Security
- Method Security
- Annotation-Based Security
- Expression-Based Access Control
- Authentication Providers
Other Activities

**Assessments**

• Objective Assessments
  -- Syntactical based
  -- Scenario based

  Note: At least 2 objective based assessments in each module

• Hands On – Practical Assessments
  -- Scenario based

  Note: At least 2 Hands on assessments in each module

**Assignments**

• Hands On – Practical Assignments

  Note: At least 4 Hands on assignments in each module

**Tasks – Home Work**

• Regular tasks on each module

  Note: Tasks are focused more to improve self learning

**Resume Support & Interview Preparation**

• Work on one or two mini projects
• Discuss and convert the current working project into Spring project to add in resume & to explain Spring experience in interviews