Spring Framework: Enterprise Java Development Simplified

Spring powers over 45% of enterprise Java applications globally. Created by Rod Johnson in 2003, it's now maintained by Pivotal.

This comprehensive framework offers robust infrastructure support for building enterprise applications through a modular, loosely coupled approach.

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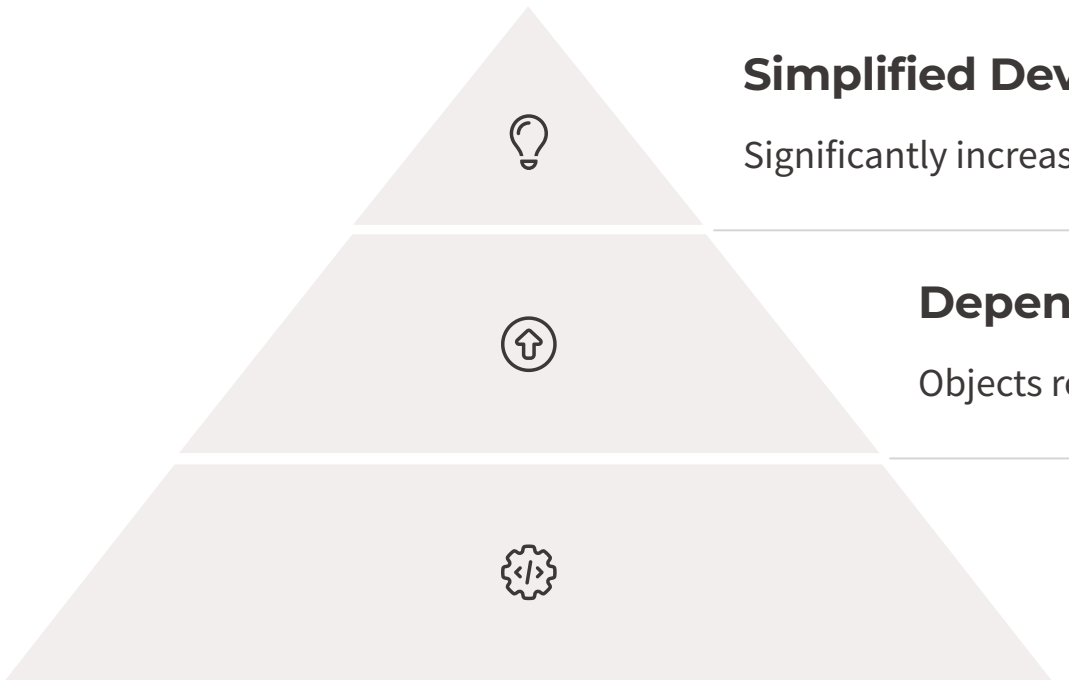
What is Spring Framework?

Spring provides a complete Java application development solution. It simplifies Java EE development with a POJO-based approach.

The framework enables enterprise-level applications through infrastructure support and modular design principles.

Core Features: Inversion of Control (IoC)



Simplified Development

Significantly increases configurability

Dependency Management

Objects receive dependencies rather than creating them

Lifecycle Control

Creates and manages object lifecycles automatically

Core Features: Dependency Injection

Define Dependencies

Specify what objects your component needs

Spring Container Magic

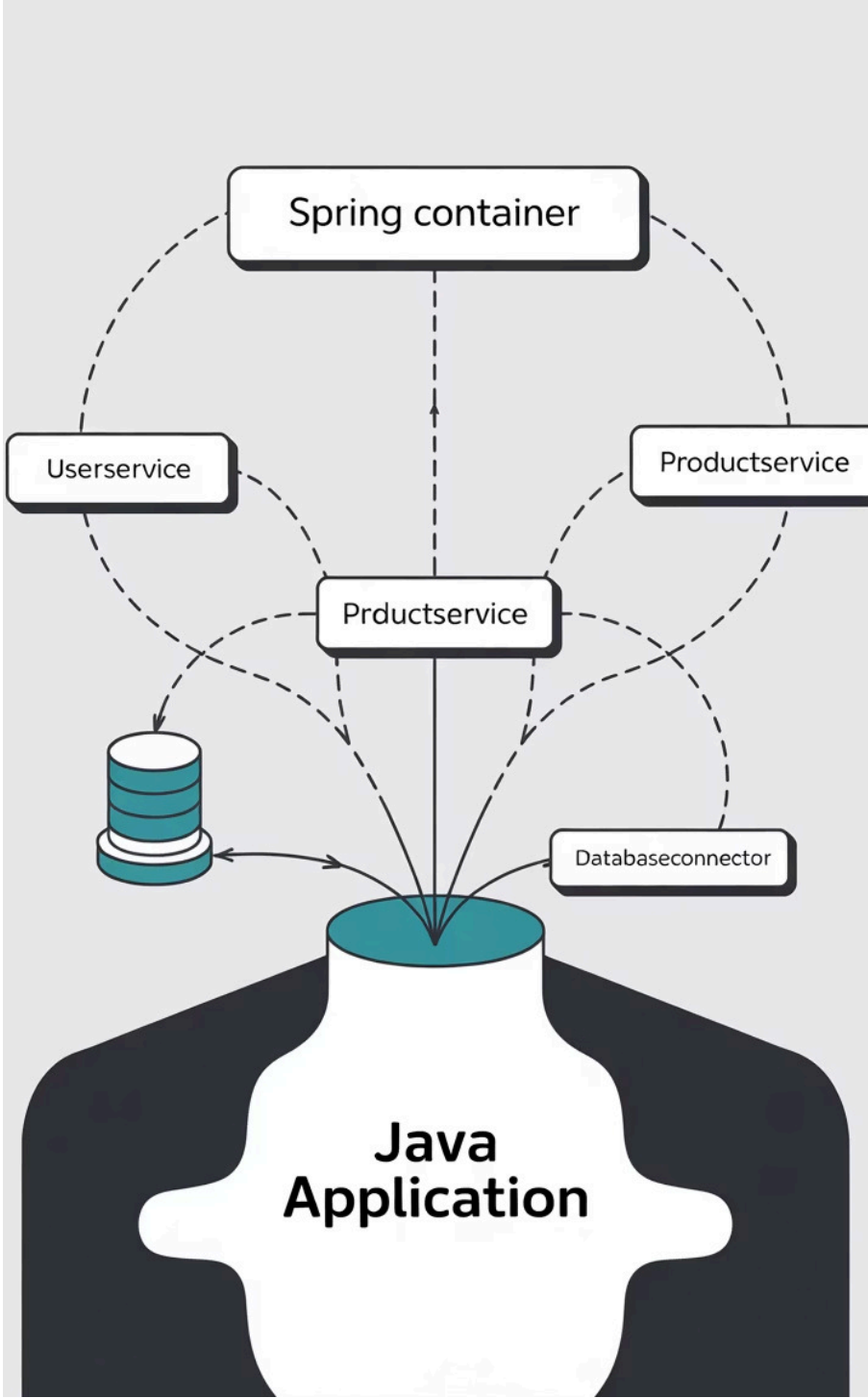
Container identifies and prepares dependencies

Automatic Injection

Dependencies provided at runtime via constructor or setter

Ready-to-Use Object

Your component has everything it needs



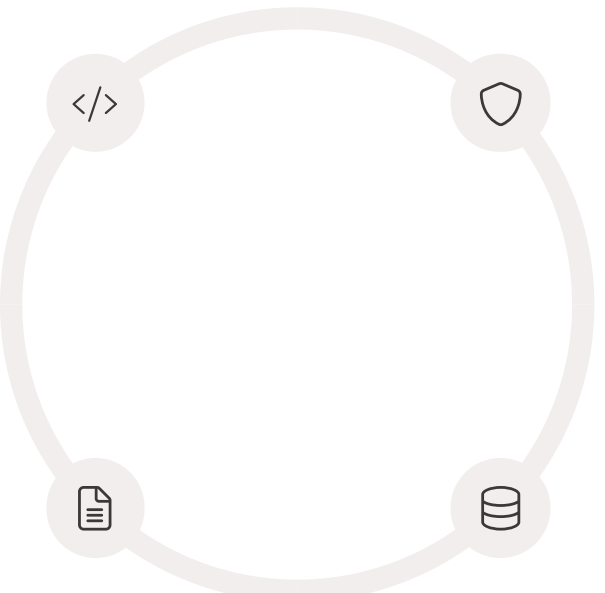
Core Features: Aspect-Oriented Programming

Business Logic

Core functionality of application components

Logging

Application activity tracking

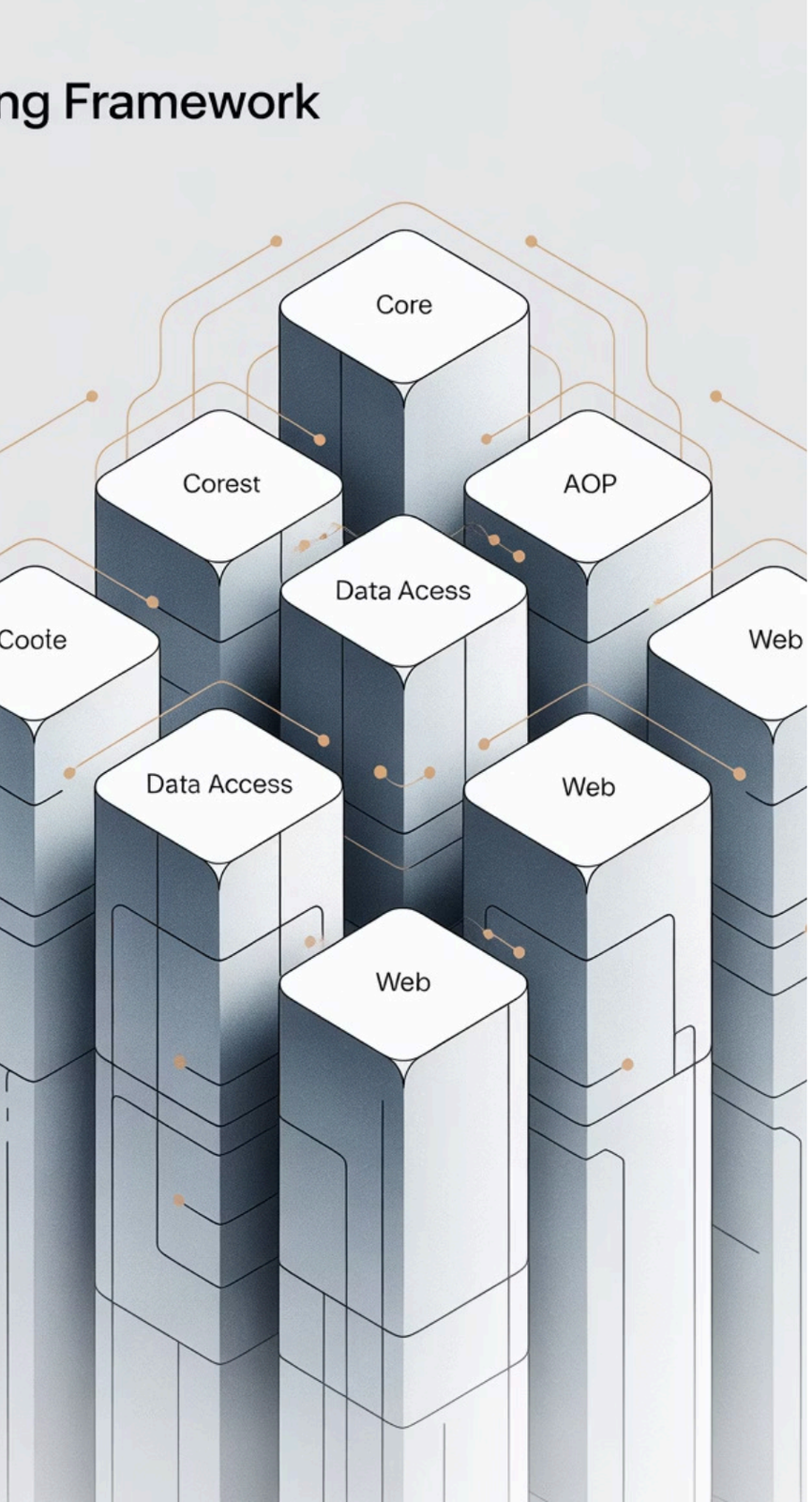


Security

Authentication and authorization aspects

Transactions

Database transaction management



Spring Architecture: Modular Design

Core Container

Fundamental modules including spring-core and spring-beans that provide IoC and DI

Context

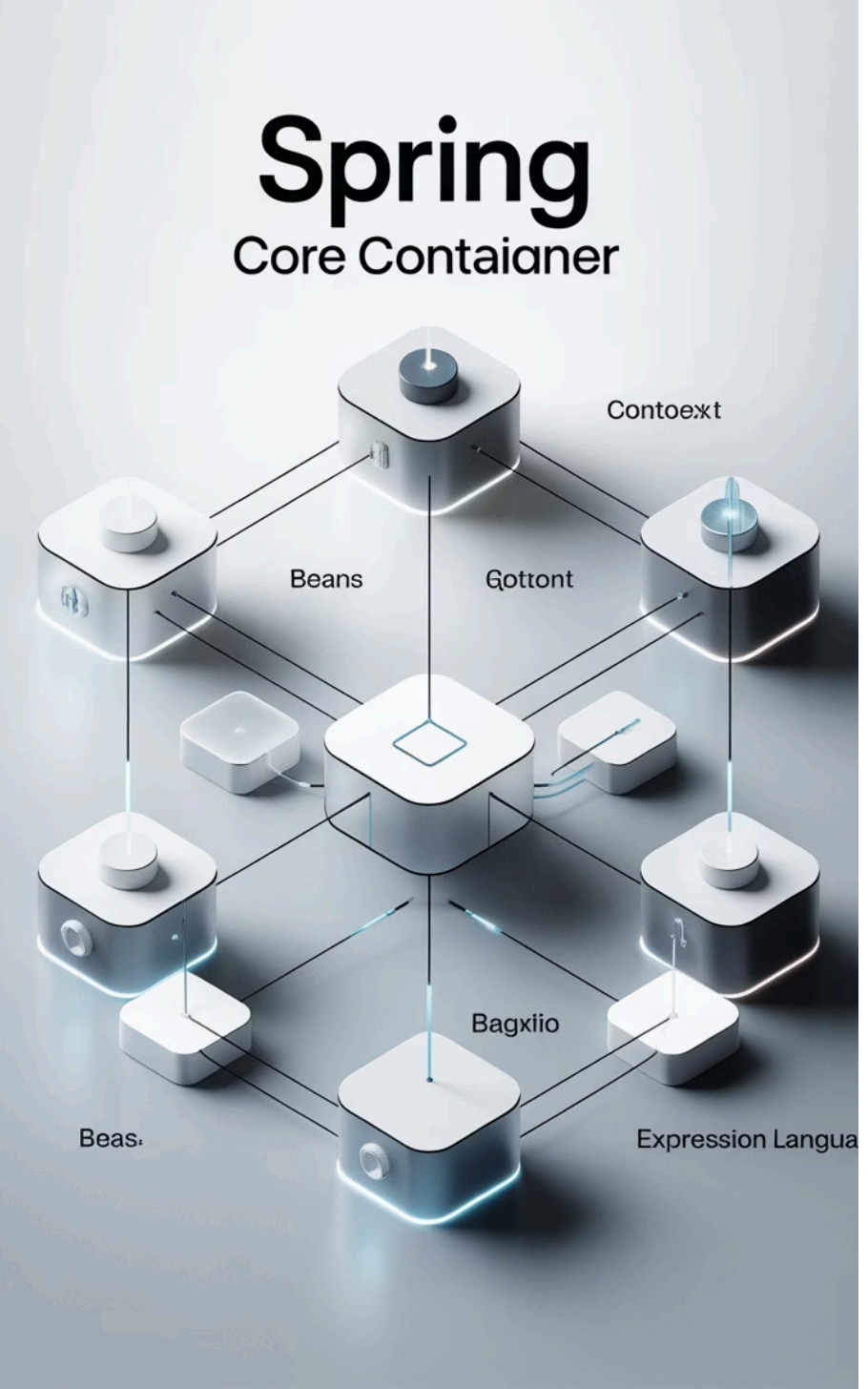
Application context implementation with spring-context and support packages

Data Access/Integration

JDBC, ORM, and transaction management modules for database operations

Web & Test

Web application support and comprehensive testing capabilities



Core Container Components

Core & Beans

Foundation modules implementing IoC/DI and BeanFactory patterns. These form the basis of all Spring applications.

Context

Builds on Core and Beans, providing medium to access defined objects. ApplicationContext extends BeanFactory.

Expression Language

SpEL enables query and manipulation of object graphs at runtime. Supports property evaluation and method invocation.

Data Access Framework

JDBC Support

Simplifies JDBC coding with templates and callbacks

ORM Integration

Seamless support for Hibernate, JPA, and other ORMs

Transaction Management

Consistent transaction handling across technologies

Exception Handling

Technology-agnostic data access exceptions

Benefits of Spring Framework

Lightweight Development

Build enterprise applications using simple POJOs instead of heavy EJBs

Reduced Boilerplate

Annotations and conventions eliminate repetitive code

Modularity

Use only what you need from the framework

Testability

Dependency injection makes unit testing straightforward

Spring Ecosystem Overview

Spring Boot

Simplified application setup with auto-configuration

Spring Cloud

Tools for distributed system development

Spring Data

Consistent access to different data technologies

Spring Security

Comprehensive security framework