RESEARCH ARTICLE	OPEN ACCESS

STUDY OF SPRING FRAMEWORK WITH APPLICATION

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Abstract:

In this paper, we are focusing on Spring, its framework which is globally used for making applications. The concepts behind the Spring has created more than just he core framework, so this paper also tells about the various characteristics and features of Spring. The Spring framework can be used with J2EE to develop applications. The model on which (i.e. Spring MVC Model) it works is also described. and the last section focuses on the architectural benefits of Spring.

Keywords: **OJO, OSGi, Security, Batch, Web Flow, Web Services, AspectJ, MVC**

1. Introduction

After its inauguration in 1997, Java quickly became the predominant platform for enterprise applications. An important reason for this success was the standardization of several common services for enterprise application as J2EE (Java 2 Enterprise Edition). This platform managed to get reckoning by several large companies such as BEA (to become part of Oracle), Oracle, IBM, Sun and SAP. Despite this success, many Java J2EE projects failed and the platform seemed highly complex, missing some vital features while other were not usable in practice.

2. Architecture

Fig. Spring's Architecture

The architecture of the Spring Framework is designed to support Simple Objects. Sometimes in the Java world they are also called POJOs (Plain Old Java Objects). The basic characteristic of such an object is that it does not depend unnecessarily on any technology. Independence from technology is a well-known test practice in software development. This has several benefits: Investment in business code is retained even if a new technology is used:- So, if you decide to migrate the application to a new environment such as a new version of an Application Server or a lightweight alternative such as a Web Server, the business logic itself is not changed. The developer can

focus on creating business value instead of dealing with the technology:- This makes him/her more productive in terms of business value generated over time. The objects can easily be tested in isolation:- Instead of using a production-like environment, all collaborating objects can be exchanged against a mock object. These is provide a behavior similar to the production environment but are much simpler. This allows faster tests and simulation of exceptional situations otherwise hard to

provide in a production-like environment. The main benefit is that errors can be tracked down to the single object that was not mocked and is therefore the only

possible source of the error. Tests of single objects in isolation are not enough:-By using the Simple Object approach it is also possible to use a lightweight alternative environment to test a collaboration of several objects. So, instead of deploying the application to a server infrastructure, which is a time consuming task, such a test can be started from the developer's Integrated Development Environment (IDE), which greatly speeds up development and enables easier debugging of the applications.

2.1 Features

Spring is a free, open source framework that offers a lot of functions to programmers. It was created by Rod Johnson and JuergenHoeller. The most important features are the

Inversion of Control, Aspect oriented programming and Spring MVC. Spring has its own MVC framework that can be used with other frameworks. The Aspect oriented programming, IoC and MVC are the important features. Aspect oriented Programming: With the help of AOP the various concerns present in a system can be separated easily. In spring aspects are joined together with the help of spring xml file and coding is well modularized.

2.2 Spring's Characteristics

Spring's values can also be applied to other areas. For this reason the Spring Framework is now complemented by a set of technologies that solve other common problems in Enterprise Computing while sharing the same values of the Spring Framework:

Spring Security: (formerly Acegi Security) is the only security solution that leverages the power of AOP. It allows the implementation of a powerful, fine-grained security system without influencing the business logic. It is not limited to role-based security but can also use Access Control Lists and can easily be extended to use other approaches. It offers an integration of security technologies such as x.509 Certificates, JAAS, LDAP, CA Site minder, HTTP Basic, HTTP Digest and can be adjusted to specific requirements, as needed.

Spring Dynamic Modules for the OSGi Platform: OSGi allows the creation of services and dynamic updates of them. This means that parts of the application can be updated without restarting the whole application. However the application has to deal with situations in which certain services are not available at runtime. The Spring Dynamic Modules framework simplifies the creation and discovery of services to become just a simple configuration. Also, dynamic updates of such services are automatically dealt with.

Spring Integration: Enterprise Integration is becoming more and more important for enterprise. A set of Patterns of Enterprise Integration has been established. Spring Integration provides a simple yet powerful programming model based on these patterns. It allows the implementation of routing, splitting and other message handling with a minimum of coding. It can be connected to several different data sources and output channels like JMS or file import/export.

Spring Batch: Batch applications remain mission critical for many enterprises. Spring Batch is the first Open Source framework that supports batch processing applications. It addresses common challenges in this area like retry, failure handling and efficient handling of batch updates to database.

Spring .NET is a port of the Spring Framework to the Microsoft .NET platform. It offers features like Dependency Injection, Aspect Oriented Programming and Enterprise Service Abstraction for a set of .NET APIs like ASP.NET, ADO.NET and NHibernate.

Spring Web Flow allows developers to model user actions as high-level modules called flows that are runnable in any environment. The framework delivers improved productivity and testability while providing a strong solution to enforcing navigation rules and managing application state.
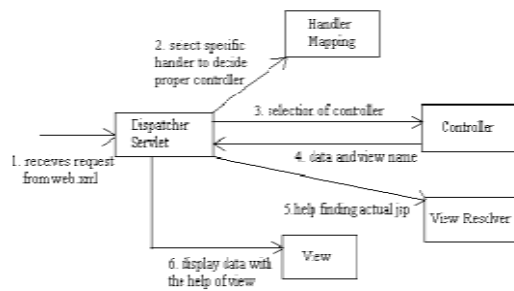
Spring Web Services focuses on creating document driven Web services. Spring Web Services aims to facilitate contract-first SOAP service development. This is done without writing WSDL manually which is known to be a very tedious task. Spring Web Services also allows for the creation of flexible web services using one of the many ways to manipulate XML payloads.

Aspect extends the AOP approach used by Spring to be even more powerful. It allows more efficient implementation of aspects and a bigger set of pointcuts, among others.

3. Spring mvc model

The Spring Framework provides its own MVC model. The major components of Spring MVC are as follows: Dispatcher Servlet- It receives the request transferred to it by web.xml file. Controller- It handles the request and is created by user. They are objects that can respond to the actions a user takes like form filling or clicking a link. View- It can be thought of as a way of representing the output to the end users.
Model And View- Whenever a request come it"s the job of Model And View to associate the view to the particular request. It is created by controller and when it executes it returns data and name of view. View Resolver- It tries to resolve the view based on output given by Model And View and select the output media. Handler Mapping- Whenever Dispatcher Servlet receives incoming requests it associates the request to individual controllers with the help of this component.

hibernate frameworks for developing efficient enterprise wide java applications thereby reducing the coupling and clear separation of layers so easy to understand. Due to the lightweight feature of Spring framework it is easy to use. It can easily work with a simple web server such as Tomcat that can also be used during integration of spring with other frameworks. Considering the current scenario wherein there is struts2 framework that can be used only for web tier; spring framework that provides all layers can be used effectively for all the three tiers to build an efficient enterprise application. The Spring framework can be easily integrated with any other ORM tool such as Hibernate with the help of XML mapping and also with iBATIS.

4. Architectural Benefits Of Spring

There are many architectural benefits of Spring framework. They can be described as follows: Spring Framework can be effectively used with other frameworks such as struts, hibernate. Spring provides easy access to database by using hibernate framework and avoiding the handling of error mechanism. Applications developed using this framework depends on few APIs. Due to its Inversion of Control feature the amount of time needed for testing the code is less. Because Spring is a layered architecture users can select which of its components can be used. The Spring Web MVC framework is robust, flexible and well designed for rapidly developing web applications.

Conclusion:-

Spring framework is a powerful framework for building enterprise wide java applications. It can also be easily integrated with some other frameworks such as struts and

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