APPUNTI FRAMEWORK SPRING E SPRING SECURITY

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# Storia dei cambiamenti

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| **DATA** | **MOTIVO DEL CAMBIAMENTO** |
| 08/01/10 – 09/18/10 | Stesura Iniziale a carico di Pasquinelli Lorenzo |
| 09/19/10 | Stesura appendice per Web Designer |
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# Lista di distribuzione

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# Scopo del documento

Scopo del presente documento è fornire degli appunti per apprendere le modalità di lavoro dei frameworks di Spring

Il documento è stato redatto in una forma estremamente dettagliata al fine velocizzare al massimo l’inserimento delle persone nel team di sviluppo.

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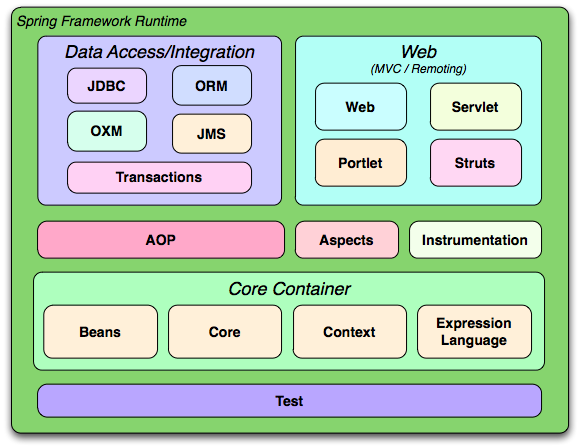
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# Che cosa è Spring

Spring è un framework open source per lo sviluppo di applicazioni web su piattaforma Java. Questo framework e stato largamente riconosciuto all'interno della comunità Java, quale valida alternativa al modello basto su Entreprise JavaBeans (EJB). Rispetto a quest'ultimo, il framework Spring lascia una maggiore libertà al programmatore, fornendo allo stesso tempo un'ampia e ben documentata gamma di soluzioni adatte alle problematiche piu comuni.

Spring fornisce una serie di funzionalità, organizzate in moduli, evidenziate :



Il Core package è la parte fondamentale del framework e fornisce le funzionalità di Inversion Of Control (IoC) e Dependency Injection. In questo modulo, il concetto base è rappresentato dal BeanFactory che fornisce una so sofisticata implementazione del pattern factory.

Il layer Data Access / Integration è composto di cinque moduli, JDBC, ORM, OXM, JMS e Transactions.

Il modulo JDBC fornisce un JDBC-abstraction layer rimuovendo il bisogno di codificare e parsificare gli errori di codice legati allo specifico database utilizzato. Questo package fornisce anche la possibilita di dichiarare facilmente un gestore delle transazioni non solo per le classe che implementano una specifica interfaccia ma anche per tutti i nostri plain old java object (POJO).

L'ORM module fornisce un livello di integrazione con le piu note API di object-relational mapping, JPA, JDO, Hibernate e iBatis. Usando questo modulo possiamo comunque sfruttare tutte le funzionalita di Spring come quella legata alla gestione delle transazioni menzionata precedentemente.

Il modulo OXM fornisce un livello di astrazione al mapping Oggetto / XML, integrandolo con le implementazioni JAXB, Castor, XMLBeans, JiBX e XStream.

Il modulo JMS fornisce invece tutte le funzionalità per la produzione ed il consumo dei messaggi.

Il modulo transaction invece fornisce il supporto alla gestione sia programmatica che dichiarativa delle transazioni alle classi che implementano delle speciali interfaccia e per tutte i POJO applicativi che vengono creati.

L'AOP package fornisce API per AOP permettendo allo sviluppatore di definire per esempio method-interceptor.

Il Web package fornisce funzionalita orientate al web fornendo un'implementazione del pattern Model-View-Controller (MVC), utile per lo sviluppo di applicazioni web.

## Il container di spring

Il package org.springframework.beans e org.springframework.context sono alla base del contenitore piu importante di Spring, chiamato IoC. Il codice di questi due package fornisce le basi della funzionalità chiamata Inversion of Control. Questa funzionalità permette ad un oggetto di diventare un partecipante passivo nel sistema, rinunciando al controllo di molte parti del sistema. L'interfaccia BeanFactory fornisce un meccanismo avanzato di configurazione capace di gestire oggetti di varia natura mentre l'interfaccia ApplicationContext lavora sopra l'interfaccia BeanFactory aggiungendo funzionalita evolute. In Spring, gli oggetti che formano il cuore della nostra applicazione, gestiti dal contenitore chiamato IoC, sono chiamati beans. Un bean e quindi un oggetto che e creato e gestito dal contenitore IoC. Questo bean e tutte le sue dipendenze sono settate in un file di configurazione xml che viene poi usato dal contenitore. Il package org.springframework.beans.factory.BeanFactory e l'attuale rappresentazione del contenitore IoC ed è quindi il responsabile della gestione dei bean. Il BeanFactory è quindi in grado di istanziare e configurare gli oggetti della nostra applicazione e di assemblare le dipendenze tra gli oggetti. Esistono varie implementazioni del BeanFactory ma la più comune è rappresentata dalla classe XmlBeanFactory. Questa implementazione permette di dichiarare gli oggetti checompongono la nostra applicazione e le dipendenze esistenti tra loro in un le di configurazione XML, noto alla classe.Per definire i bean usiamo un insieme di elementi <bean> dichiarati all'interno di un elemento <beans>. Sono esempi di bean i:

- service layer objects;

- i data access object (DAOs);

- i presentation object;

- oggetti dell'infrastruttura come l'Hibernate SessionFactory.

Vediamo sotto un esempio di struttura di un file di configurazione di tipo Xml:

|  |
| --- |
| <? xml version ="1.0" encoding =" UTF -8"? >  <beans xmlns =" http ://www.springframework . org/schema /beans " xmlns : xsi =" http :// www .w3. org /2001/ XMLSchema - instance " xsi : shemaLocation =" http://www.springframework.org/ schema /beans" >  <bean id ="..." class ="..." >  <!-- inserire qui le configurazioni del bean -->  </bean >  <bean id ="..." class ="..." >  <!-- inserire qui le configurazioni del bean -->  </bean >  <!-- inserire qui altre definizioni di bean -->  </beans > |

Ogni definizione di bean può contenere i seguenti dettagli:

1. Class: nome della classe che implementa il bean.

2. Id e nome.

3. Argomenti del costruttore.

4. Property.

IL BeanFactory deve poi essere istanziato nel seguente modo:

Resource res = new FileSystemResource("beans.xml");

XmlBeanFactory factory = new XmlBeanFactory(res)

Ogni bean può avere uno o più identificatori che devono essere univoci all'interno del contenitore, se ne ha più di uno, quelli superflui devono essere considerati alias.

Per istanziare una classe esistono due meccanismi:

* Creare un bean utilizzando un costruttore, spesso è necessario anche creare un costruttore vuoto.
* Istanziare il bean usando un metodo statico di tipo factory.

I Bean possono essere sviluppati in uno dei due seguenti modi: singleton o non-singleton.

Quando un bean è di tipo singleton, saràgestita solo un'istanza condivisa del bean e tutte le richieste di quel bean arriveranno a un'unica istanza, se invece il bean è di tipo non-singleton verrà creata una nuova istanza di quel bean a ogni richiesta. I bean sono sviluppati in modo singleton di default a meno che non sia stato specificato altrimenti.

Mentre il package beans fornisce le funzionalità base per gestire e manipolare i bean il package context fornisce l'interfaccia ApplicationContext che deriva dall'interfaccia Bean-Factory.

L'ApplicationContext aggiunge nuove funzionalita come:

* MessageSource: fornisce accesso ai messaggi in stile i18n.
* Accesso alle risorse come URL e file.
* Propagazione degli eventi all'interno dei bean che implementano l'interfaccia ApplicationListener.
* Caricamento di contesti multipli e gerarchicamente separati, in modo da collegare un context a ogni layer della nostra architettura.

## MessageSource

L'ApplicationContext estende l'interfaccia MessageSource che le permette di risolvere un'insieme di messaggi.

Uno dei metodi piu importanti è sicuramente:

String getMessage(String code, Object[] args, String default, Locale loc);

Questo metodo permette di ottenere un messaggio dal MessageSource. Se non vengono trovati messaggi per lo specico locale, viene usato il message di default.

Spring ha inoltre due diverse implementazioni del MessageSource :

* ResourceBundleMessageSource
* StaticMessageSource

Quando viene caricato l'ApplicationContext, viene ricercato il bean che definisce il MessageSource, tale bean deve avere con identificatore messageSource e utilizzare la classe ResourceBundleMessagesource. Se viene trovato il bean la chiamata al metodo getMessage(...) sarà delegata al MessageSource che è stato trovato.

In caso non venga trovato il bean, si procede a cercare nella gerarchia dei context. Nel caso in cui non venga trovato, viene istanziato un oggetto di tipo StaticMessageSource che accetta le chiamate al metodo getMessage(...).

La gestione degli eventi nell'ApplicationContext avviene attraverso la classe ApplicationEvent e l'interfaccia ApplicationListener.

Ogni volta che verrà notificato un evento ApplicationEvent verrà richiamato il bean che implementa l'interfaccia ApplicationListener.

Spring fornisce tre eventi di tipo standard:

* ContextRefreshedEvent Noticato quando l'ApplicationContext è stato inizializzato, ossia tutti i bean sono stati istanziati e quelli di tipo singleton sono stati preistanziati.
* ContextClosedEvent Notificato quando l'ApplicationContext e stato chiuso ossia tuttii bean di tipo singleton sono stati distrutti.
* RequestHandledEvent Evento notificato a tutti i bean; serve a comunicare che una HTTP request e stata servita.

Oltre agli eventi di tipo standard è possibile implementare nuovi eventi che verranno aggiunti grazie alla chiamata del metodo publishEvent(...).

## Spring MVC

Il modulo MVC di Spring, come altri framework web, e di tipo request-driven1; cuore del framework e rappresentato da una servlet che riceve le richieste e le inoltre ai controller sulla base di precise regole, come rappresentato in Figura 6.1.

Questa servlet centrale si chiama DispatcherServlet ed è integrata completamente nel contenitore IoC, il che le permette di avere accesso a tutte le funzionalità di Spring.

Il DispatcherServlet deriva dalla classe base HttpServlet ed è dichiarata nel file di configurazione dell'applicazione chiamato web.xml.

Le richieste che devono essere gestite dal DispatcherServlet devono essere dichiarate nello stesso file web.xml e sono associate ai controller con un metodo basato sull'URL.

Ecco un esempio di dichiarazione di DispatcherServlet:

<?xml version="1.0" encoding="UTF-8"?>

<web-app version="2.5" xmlns="http://java.sun.com/xml/ns/javaee" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app\_2\_5.xsd">

<servlet >

<servlet -name > biblio </ servlet -name >

<servlet -class > org . springframework . web . servlet . DispatcherServlet

</ servlet -class >

<load -on - startup >1 </ load -on - startup >

</ servlet >

<servlet - mapping >

<servlet -name > biblio </ servlet -name >

<url - pattern >\*. htm </ url - pattern >

</ servlet - mapping >

<welcome -file -list >

<welcome -file > index .jsp </ welcome -file >

</ welcome -file -list >

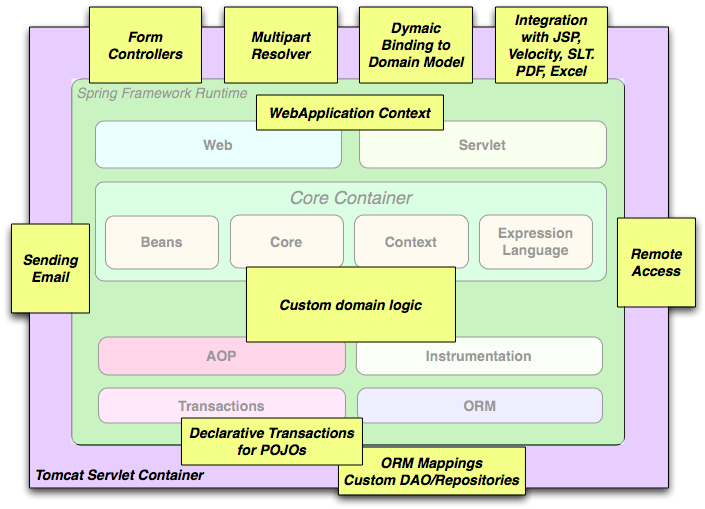
</web -app >

Come si può osservare tutte le richieste che terminano con .htm verranno gestite dal DispatcherServlet chiamato biblio.

Nel MVC framework, ogni DispatcherServlet ha il suo WebApplicationContext che eredita tutti i bean definiti nel root ApplicationContext. I bean ereditati possono essere sovrascritti nello specifico scope della servlet e nuovi bean possono essere deniti localmente all'istanza della servlet.

Il WebApplicationContext è un'estensione dell'ApplicationContext e fornisce le funzionalità necessarie al livello presentazione. Ad esempio è in grado di risolvere i theme e di conoscere le associazioni con la servlet.

Nella Figura si può vedere una schematizzazione dell'architettura web di Spring.



Sss

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