

Test~Driven Development with Spring and Hibernate

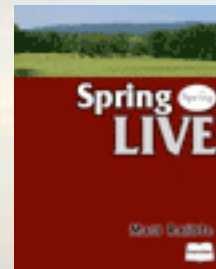
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Introductions

- Your experience with webapps?
- Your experience with J2EE?
- What do you want to get from this tutorial?
- Open Source experience with Ant, XDoclet, Hibernate, Spring, Eclipse/IDEA?

Who is Matt Raible?

- Developing websites since 1994 - Developing J2EE webapps since 1999
- Committer on several open source projects: AppFuse, Roller Weblogger, XDoclet, Struts Menu, Display Tag
- J2EE 5.0 and JSF 1.2 Expert Group Member
- Author: Spring Live (SourceBeat) and contributor to Pro JSP (Apress)



Agenda ~ Part I

- [Lab] Setup machines: JDK, Ant, AppFuse, Eclipse, MySQL and Tomcat
- Overview of J2EE, Spring and Hibernate
- AppFuse: History, Overview and Demo

Agenda ~ Part II

- [Lab] Creating database tables using Ant and Hibernate
- JUnit and Test-Driven Development
- Review of interface vs. implementation classes
- [Lab] Writing a WeblogDAOTest JUnit test
- Overview of Spring's DAO Support classes for Hibernate
- [Lab] Write WeblogDAO interface and WeblogDAOHibernate implementation

Agenda ~ Part III

- Business Facade: What is it and why should I use one?
- [Lab] Writing a WeblogManagerTest with jMock
- [Lab] Writing a WeblogManager interface and implementation
- [Lab] Defining the “weblogManager” bean and per-method transaction attributes
- Alternative I: Generic DAO and Manager
- Alternative II: Code Generation

Agenda ~ Optional

- Pick your favorite Java web framework:
 - JSF, Struts, Spring MVC, Tapestry or WebWork
- Testing Controllers (or page backing objects) for selected framework
- Testing the UI with Canoo WebTest and Ant

J2EE, Spring and Hibernate

- **EJB 2.1**: difficult to test, overkill for most applications
- **JDBC**: closing resources, checked exception, cumbersome to populate POJOs
- **Hibernate**: simplifies persistence and makes working with POJOs easy
- **Spring**: runtime exceptions, de-couples dependencies, simplifies APIs (JNDI, etc.)

AppFuse ~ what is it?

- A directory structure, build file and project classes to get your project started quickly
- The hard part is getting started and configuring dependencies
- Uses popular open-source tools: Ant, XDoclet, Spring, Hibernate, Struts (or JSF, Spring MVC, WebWork or Tapestry)
- Top 5 java.net project in hits, accesses and mail traffic

History









- Started as a sample app for Pro JSP
- Became a toolkit for starting new projects
- Lots of community feedback makes it a “best practices” webapp for J2EE
- Documentation and Tutorials (November 2003)
- AppGen - CRUD made easy (November 2004)
- New Committers: Nathan, Ben and Sanjiv (2005)



























Development Environment

- Download and install:
 - Ant 1.6.2+
 - MySQL 4.1.x (or 5.0.x)
 - Tomcat 5.0.29
 - Eclipse 3.1 (or IDEA 4.5.x)
 - AppFuse 1.8

Dependencies

Optional Installs

Name
 appgen
 cruisecontrol
 ibatis
 jsf
 myjavapack
 spring
 tapestry
 webwork

Name
 ant-contrib-1.0b1
 cargo-0.5
 checkstyle-3.1
 clickstream-1.0.2
 dbunit-2.1
 displaytag-1.0
 dumbster-1.5
 hibernate-3.0.3
 jakarta-log4j-1.2.9
 jakarta-struts-1.2.4
 jakarta-taglibs
 java2html-1.3.1
 javamail-1.3.1
 jmock-1.0.1
 junit3.8.1
 mysql-connector-java-3.1.7
 pmd-3.0
 rename-packages-1.1
 servletapi-2.3
 sitemesh-2.2.1
 spring-1.2
 struts-menu-2.3
 urlrewrite-1.2
 velocity-1.4
 webtest-build574
 xdoclet-1.2.3

Directory Structure

Name
docs
lib
metadata
conf
sql
templates
web
src
dao
service
web
test
dao
service
web
web
common
decorators
demos
images
pages
scripts
styles
WEB-INF

Demo of Features

- Acegi Security - makes security more portable between containers
- Remember Me and Self Registration
- GZip Compression Built-in
- Testing environment ready to go, many tutorials, CruiseControl files included
- <http://demo.appfuse.org/appfuse>

Part II ~ Testing DAOs

Create database & table

- Create new project and database with Ant
- Create Weblog.java POJO and generate Hibernate mapping file with XDoclet
- Configure Spring to be aware of Weblog object
- Create “weblog” table from POJO using Ant

JUnit and Interfaces

- TDD makes you think before you code
- JUnit is easiest to test with because of plethora of tools and examples
- Writing interfaces allows de-coupling of layers and implementation
- Write code to test interface (integration test) or implementation (unit test)

Let's write some code!

- What is a DAO?
- Create WeblogDAOTest - Test First!
- Create WeblogDAO Interface
- Create WeblogDAOHibernate implementation
- Create “weblogDAO” bean definition in Spring context file
- Run JUnit Test

Spring simplifies testing

- Spring's `org.springframework.test` package has a number of base classes to simplify testing
 - [`AbstractDependencyInjectionSpringContextTests`](#) - can do both setter or field-based dependency injection, cached context files
 - [`AbstractTransactionalDataSourceSpringContextTests`](#) - exposes a `JdbcTemplate` for easy querying and rolls back any data entered into the database

Part III ~ Testing with Mocks

Business Facades

- Encapsulates business logic for multiple clients
- Similar to Business Delegate pattern for EJBs
- Provide client-friendly, transactional access to data layer
- Facilitates calling multiple DAOs within the same transaction
- Can be exposed as web services

Yee haw ~ more code!

- Create WeblogManagerTest - a true unit test that uses jMock for mocking dependencies
- Create WeblogManager Interface
- Create WeblogManagerImpl implementation
- Run JUnit Test
- Create “weblogManager” bean definition

So this is better, huh?

- Created 7 classes, modified 2 files, generated 1
- Faster than traditional EJB/JDBC, but still painful
- Faster options:
 - BaseDAO/Manager classes in AppFuse for Generic CRUD on any POJO
 - Generate/modify files with AppGen or AppFuse Generator

AppGen

- To create CRUD for a table, it required you create 11 files and modify 5
- AppGen requires you create 1 and modify 1
- Uses BaseHibernateDAO and BaseManager for generic CRUD methods
- Still requires you to “pretty up” the UI
- AppGen Video ➡

Part IV ~ Web Development

Creating the UI

- WeblogControllerTest and WeblogFormControllerTest
- WeblogController and WeblogFormController
- weblogList.jsp and weblogForm.jsp
- Validation Rules with XDoclet and Commons Validator
- Testing the UI with Canoo WebTest and Ant

End of Coding

- Any code tweaks you'd like to see?
- Deploying to production
 - Setup MySQL with create-tables.sql
 - Setup Tomcat with JDBC Drivers
 - Deploy using Tomcat's Manager application
 - Hosting: kgbinternet.com, contegix.com

AppFuse Roadmap

- Continue to try and make IDE integration easier
- Support/Documentation for more app servers
- iBATIS Tutorials, refactor build/test process
- Other things you'd like to see?

Equinox

- AppFuse Light - designed for quick apps with few requirements (i.e. prototypes)
- No build-time dependencies (i.e. XDoclet), no out-of-the-box security
- Includes 5 MVC implementations: JSF, Spring MVC, Struts, Tapestry and WebWork
- Includes 5 Persistence frameworks: Hibernate, iBATIS, JDO, OJB, Spring JDBC
- Located at <http://equinox.dev.java.net>

Questions?

- AppFuse Official Homepage:
 - <http://appfuse.dev.java.net>
- Demos and Videos:
 - <http://demo.appfuse.org/demos.html>
- Tutorials:
 - <http://appfuse.org/tutorials>