Spring Web Update

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About The Speaker

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Topics

- **Spring Web**
- @MVC
- REST Support
- Spring EL
- Portfolio Changes
- Looking Forward

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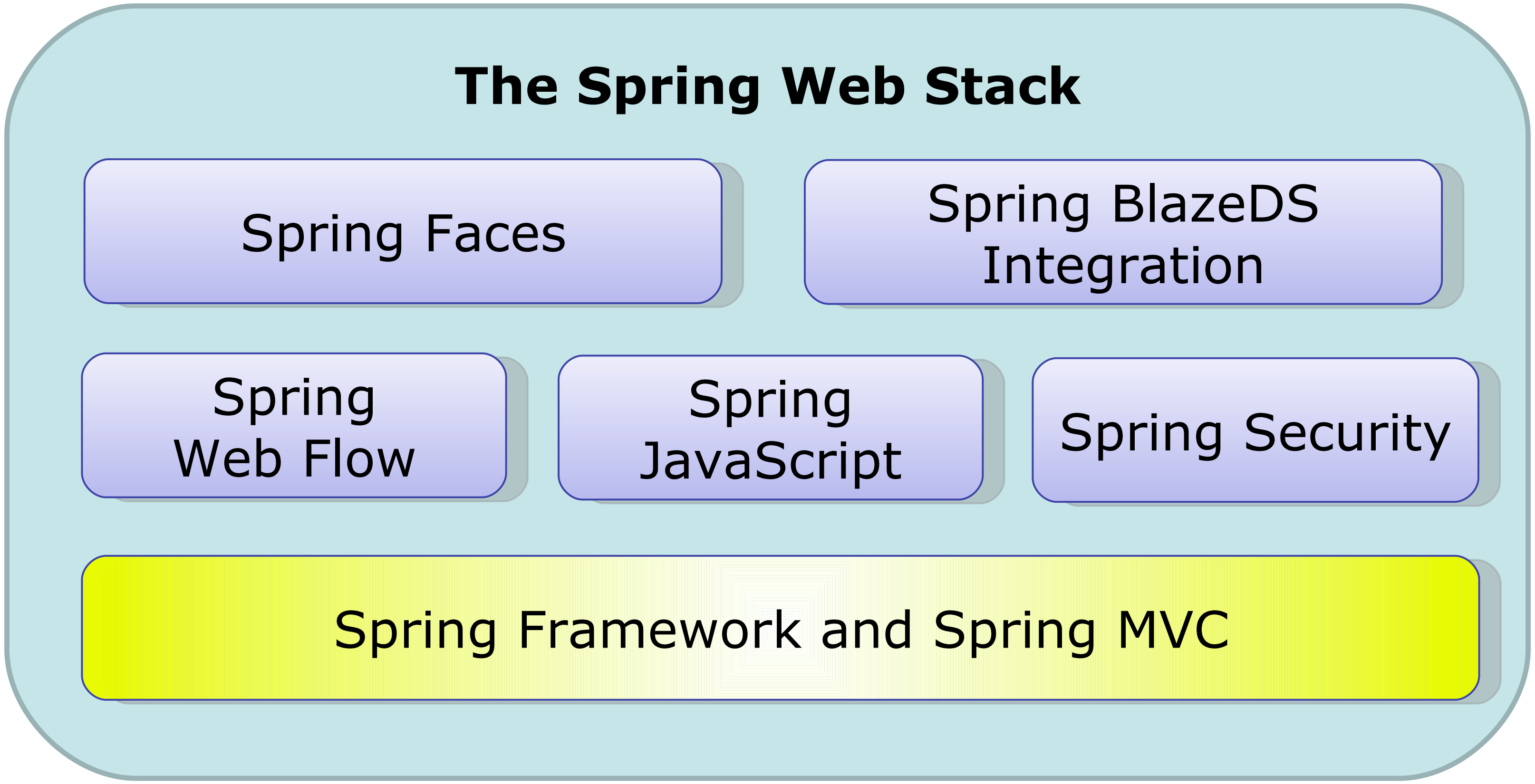
The Spring Web Stack



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Spring Web Components

- Spring Framework and Spring MVC
  - The foundation for all other components
- Spring JavaScript
  - JavaScript and Ajax integration
- Spring Web Flow
  - Stateful web conversations
- Spring Security
  - Security framework

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More Spring Web Components

- Spring Faces
  - Integration with JavaServer Faces™
- Spring BlazeDS Integration

  Integration with Adobe Flex™ clients

This focus of this presentation is ongoing changes Spring MVC in the Spring Framework

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Review Of @MVC

- From Controller to @Controller
  - No base class
  - Multiple request-handling methods per class
  - Flexible method signatures
  - No XML for individual controllers
- Not just an alternative to XML
  - A more flexible programming model

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Default Request Mapping

```
@Controller
public class OwnerController {

  @RequestMapping("/owner/show")
  public void show(int id) {
    ...
  }
}
```

Method mapped to:

```
/owner/show
/owner/show.*
```

DefaultAnnotationHandlerMapping

(enabled by default)

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Splitting the Question: Which Controller vs. Which Method?

```
<bean class="org.springframework.web.servlet.handler.SimpleUrlHandlerMapping">
    <property class="mappings">
        <value>
            /owner/*=ownerController
        </value>
    </property>
</bean>
```

(1) A central place for deciding which controller

(2) Annotations for deciding which method?

```
@Controller
public class OwnerController {

    @RequestMapping
    public void show(int id) {
        ...
    }
}
```

Controller For Owner Resource

```
@Controller
public class OwnerController {

    @ModelAttribute
    public Owner loadOwner(@RequestParam("id") int id) { ... }

    @RequestMapping(method = RequestMethod.GET)
    public void show() { ... }

    @RequestMapping(method = RequestMethod.GET)
    public void form() { ... }

    @RequestMapping(method = RequestMethod.POST)
    public String form(Owner owner, BindingResult result) { ... }

}
```

Controller mapped to:
`/owner/*`

Annotations decide which method?

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REST Support In Spring MVC

- Why not “Spring REST” (or Spring WS)?
- Spring MVC well-suited for REST
  - Easy to process HTTP requests
  - Easy to render diverse content types
  - Familiar programming model
- @MVC brought further flexibility
  - Map by request method, request parameter

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URI Templates (Server-Side)

```
@Controller
public class HotelController {

    GET /hotel/1/date/2009-03-26

    @RequestMapping(value = "/hotel/{hotel}/dates/{date}")
    public String show(@ParthVariable("hotel") long hotelId,
                       @ParthVariable Date date, Model model) {
        ...
    }

}
```

Extract path variables

URI Templates (Client-Side)

- <spring:url> tag
  - Supports template placeholders
  - Backwards-compatible with c:url

```
<spring:url value=”/hotel/{hotel}/dates/{date}” xmlEscape=”true”>
    <spring:param name=”hotel” value=”1”/>
    <spring:param name=”date” value=”2009-03-26”/>
</spring:url>
```

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Content Negotiation

- In REST the client decides acceptable representations of a resource
- Content type indicated in request header or file extension
- Server responds accordingly

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Different Representations

- JSON

```
GET http://host/context/app/hotels/1 accepts application/json
GET http://host/context/app/hotels/1.json
```

- XML

```
GET http://host/context/app/hotels/1 accepts application/xml
GET http://host/context/app/hotels/1.xml
```

- ATOM

```
GET http://host/context/app/hotels/1 accepts application/atom+xml
GET http://host/context/app/hotels/1.atom
```

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New Spring MVC Views

- AbstractAtomFeedView
- AbstractRssFeedView
- MarshallingView
  - `org.springframework.oxm`
- JacksonJsonView

New Spring module (originally in Spring WS)

Part of Spring JS

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Selecting A View

- Controllers are agnostic to the view technology (typically)

```
@RequestMapping(value = ”/hotel/{hotel}”)
public String show(@ParthVariable(”hotel”) long id, Model model) {
    ...
    return ”hotel/show”;        <-------- Logical view name
}
```

Alternating View Types

- Requires a ViewResolver chain
  - BeanNameViewResolver (order=0)
  - InternalResourceViewResolver (order=1)
- One or more custom view beans
  - HotelsAtomView (id="hotel/show.atom")
- A HandlerInterceptor to detect the content type and modify the view name
  - "hotels/show" => "hotel/show.atom"

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The Content Negotiating ViewResolver

- Does not resolve views itself
- At startup
  - Picks up other ViewResolvers from the web application context
- At runtime
  - Detects client requested content type
  - Queries each ViewResolver
  - Searches for a matching view by content type

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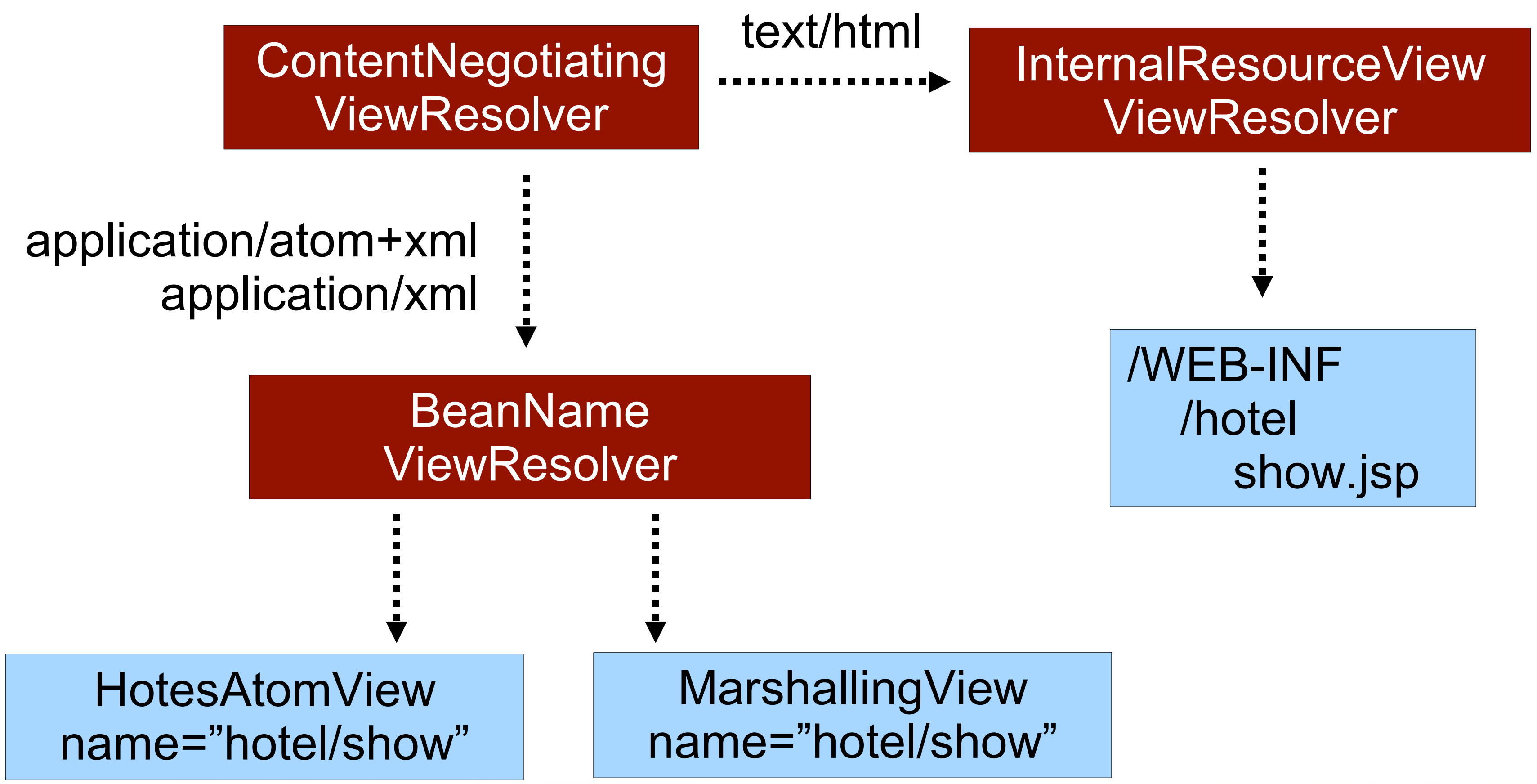
Content Negotiating View Resolver Example


ContentNegotiating ViewResolver
text/html
InternalResourceView ViewResolver
application/atom+xml
application/xml
BeanName ViewResolver
/WEB-INF
/hotel
show.jsp
HotesAtomView name=”hotel/show”
MarshallingView name=”hotel/show”

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REST Uniform Interface

- Many resources (URLs)
- Limited set of methods (GET, PUT, POST, DELETE)
- Increases the value of an application
- HTML supports only GET and POST

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Hidden HTTP Method Filter

- Spring form tag allows all request methods

```
<form:form method="delete">
  <input type="submit" value="Delete"/>
</form:form>
```

Submits POST, actual DELETE is in a hidden parameter.

- Request can be mapped by "real" method

```
@RequestMapping(value = "/hotel/{hotel}", method = DELETE)
public String delete(@ParthVariable("hotel") long id) { ... }
```

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REST Template

- Methods for REST full communication

– DELETE	delete
– GET	getForObject
– HEAD	headForHeaders
– OPTIONS	optionsForAllow
– POST	postForLocation
– PUT	put
– ANY	execute

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REST Template Details

- Methods work with URI templates
- Conversion of input & output objects via HttpMessageConverter

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ETag Support

- In REST GET is Cacheable
- Server returns ETag header value
  - `ETag: "c5de2d"`
- Value is sent on subsequent retrieval
  - `If-None-Match: "c5de2d"`
- Server returns 304 (Not Modified)

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ShallowETagHeaderFilter

- Computes ETag header value based on MD5 of rendered view
- Saves bandwidth only

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Other @MVC Refinements

- @RequestHeader
  - Access to request headers
- @CookieValue
  - HTTP cookie access

```
@RequestMapping
public String delete(@RequestHeader(”region”) long regionId,
            @CookieValue(”language”) String languageId) {
   …
}
```

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Demo

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Spring EL

- EL implementation included in Spring 3.0
  - package org.springframework.expression
  - next-generation expression engine inspired by Spring Web Flow 2.0's expression support
- Compatible with Unified EL syntax and more powerful
  - navigating bean properties, collections, maps, custom
  - method invocations
  - construction of value objects

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EL In Bean Definitions

```
<bean class="mycompany.RewardsTestDatabase">

   <property name="databaseName"
         value=""#{systemProperties.databaseName}"/>

   <property name="keyGenerator"
         value=""#{strategyBean.databaseKeyGenerator}"/>

</bean>
```

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EL In Component Annotations

```
@Repository
public class RewardsTestDatabase {

    @Value(“#{systemProperties.databaseName}”)
    public void setDatabaseName(String dbName) { … }

    @Value(“#{strategyBean.databaseKeyGenerator}”)
    public void setKeyGenerator(KeyGenerator kg) { … }
}
```

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EL Context Attributes

- Example showed access to EL variables
  - "systemProperties", "strategyBean"

- Implicit variables to be exposed by default, depending on runtime context
  - e.g. "systemProperties", "systemEnvironment"
    - global platform context
  - access to all Spring-defined beans by name
    - similar to managed beans in JSF expressions
  - extensible through Scope SPI
    - e.g. for step scope in Spring Batch 2.0

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Web Context Attributes

- Implicit web context variables to be exposed by default as well
  - "contextProperties": web.xml init-params
  - "contextAttributes": ServletContext attributes
  - "request": current Servlet/PortletRequest
  - "session": current Http/PortletSession

- Exposure of all implicit JSF variables when running within a JSF request context
  - "param", "initParam", "facesContext", etc
  - full compatibility with JSF managed bean facility

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New Project Layout

- Framework modules revised
  - now managed in Maven style
  - one source tree per module jar
    - spring-beans.jar, spring-aop.jar, etc
  - no spring.jar anymore!
- Built with new Spring build system as known from Spring Web Flow 2.0
  - consistent deployment procedure
  - consistent dependency management
  - consistent generation of OSGi manifests

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Portfolio Rearrangements

- Spring 3.0 will include a revised version of the Object/XML Mapping (OXM) module
  - known from Spring Web Services
  - JAXB2, JiBX, Castor, XMLBean, XStream

- Spring 3.0 will include the core functionality of Spring JavaConfig
  - configuration classes defining managed beans

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Pruning & Deprecation in 3.0

- Some pruning planned
  - Commons Attributes support
  - traditional TopLink API support
    - in favor of JPA (EclipseLink)
  - subclass-style Struts 1.x support
- Some deprecation planned
  - traditional MVC controller class hierarchy
    - superseded by annotated controller style
  - traditional JUnit 3.8 test class hierarchy
    - superseded by test context framework
  - several outdated helper classes

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Spring 2.5 Mission Continued

- Spring 3 continues Spring 2.5's mission
  - fully embracing Java 5 in the core Spring programming and configuration model
  - now with even the core framework requiring Java 5
    - all framework classes using Java 5 language syntax
- Backwards compatibility with Spring 2.5
  - 100% compatibility of programming model
  - 95% compatibility of extension points
  - all previously deprecated API to be removed
    - Make sure you're not using outdated Spring 1.2 / 2.0 API anymore!

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Model Validation

```
public class Reward {
   @NotNull
   @ShortDate
   private Date transactionDate;
}
```

In view:

```
  <form:input path="transactionDate">
```

- Common Validation System SPI used by MVC and Web Flow
- **Hibernate Validator** annotations supported
- **JSR 303 (Bean Validation)** to be supported as well
- Same metadata can be used for persisting, rendering, etc

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Conversation Management

- Key problem: **isolating concurrent windows** in same browser
  - shared HTTP session
  - several independent conversations going on
    - keeping independent state
- Generalized solution: conversation scope with shorter lifetime than session
  - scope="conversation"
    - on-demand scoping of conversational Spring beans
    - MyFaces Orchestra style
  - Spring Web Flow 3 provides more sophisticated flow navigation management on top

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Binding & Type Conversion

- Revised binding & type conversion infrastructure
- Includes the capabilities of Web Flow's binding
  - Stateless type converter objects
  - EL integration
- Spring MVC and Web Flow will share this infrastructure

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Resources

SpringSource Blogs:

- Spring Framework 3.0 M2 released
- Building Spring 3
- REST in Spring 3: @MVC
- Adding an Atom view using Spring's REST support
- REST Template (to be posted today)
- http://blog.springsource.com

Check out from trunk:

- Petclinic Sample (Eclipse-enabled with WTP settings)
- Unit tests

Track changes:

- https://fisheye.springframework.org/

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Questions and Comments

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