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Building Next-Gen Web Applications with the Spring 3.0 Web Stack

spring source

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Intro

Battling the rising complexity of web application development with Spring

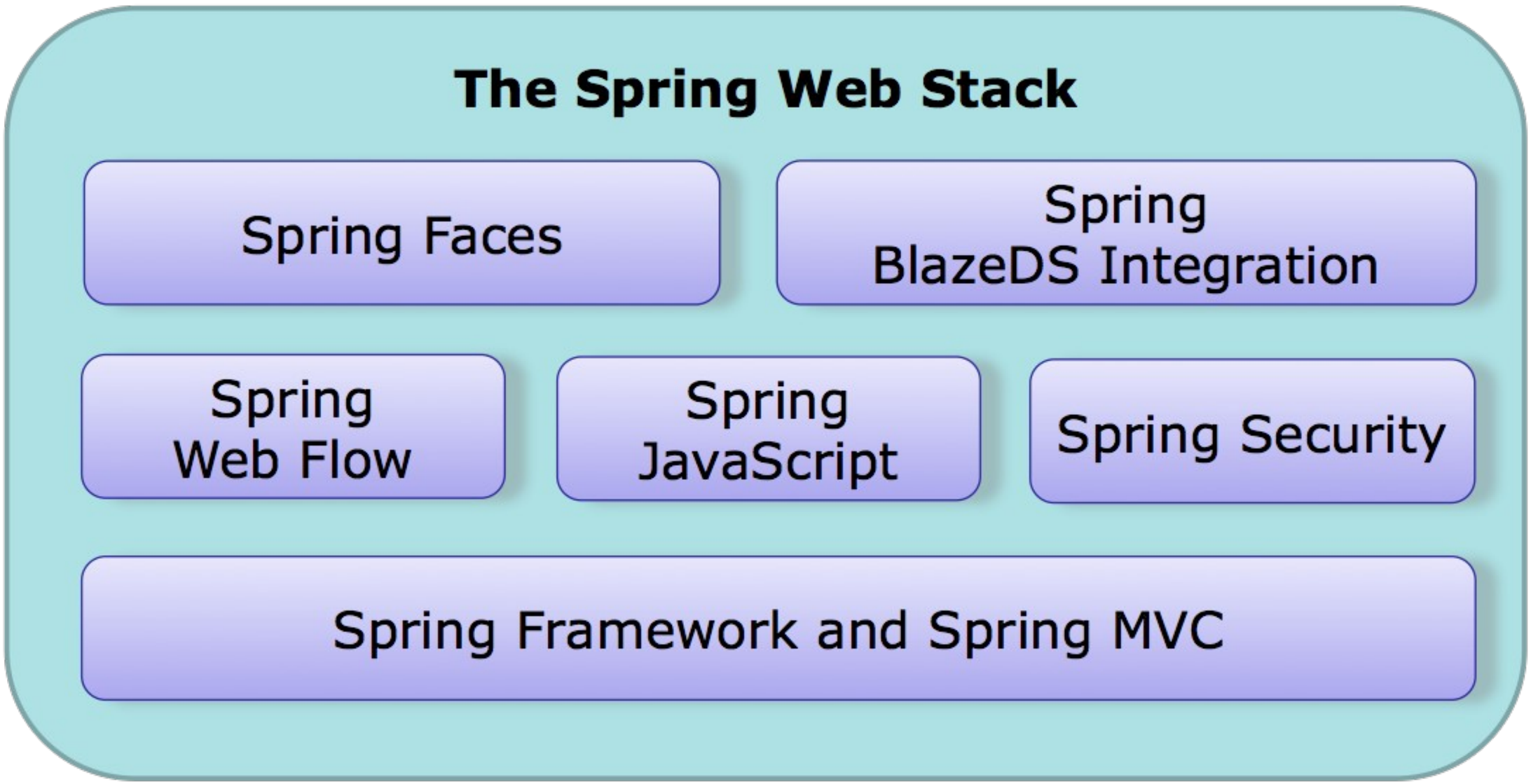
The Modern Web Dilemma

- Web application requirement complexity continues to rise
  - How do we manage this complexity?
  - How do we expose our services to the largest possible audience?
  - How do we give users the best possible experience?

The Spring Web Stack - Battling Complexity

- The Spring Web Stack gives you:
  - unified programming model
  - multiple client types served with the same foundation
  - adaptability - the right approach (i.e., stateless, stateful) for the given use case

What makes the Spring Web Stack?



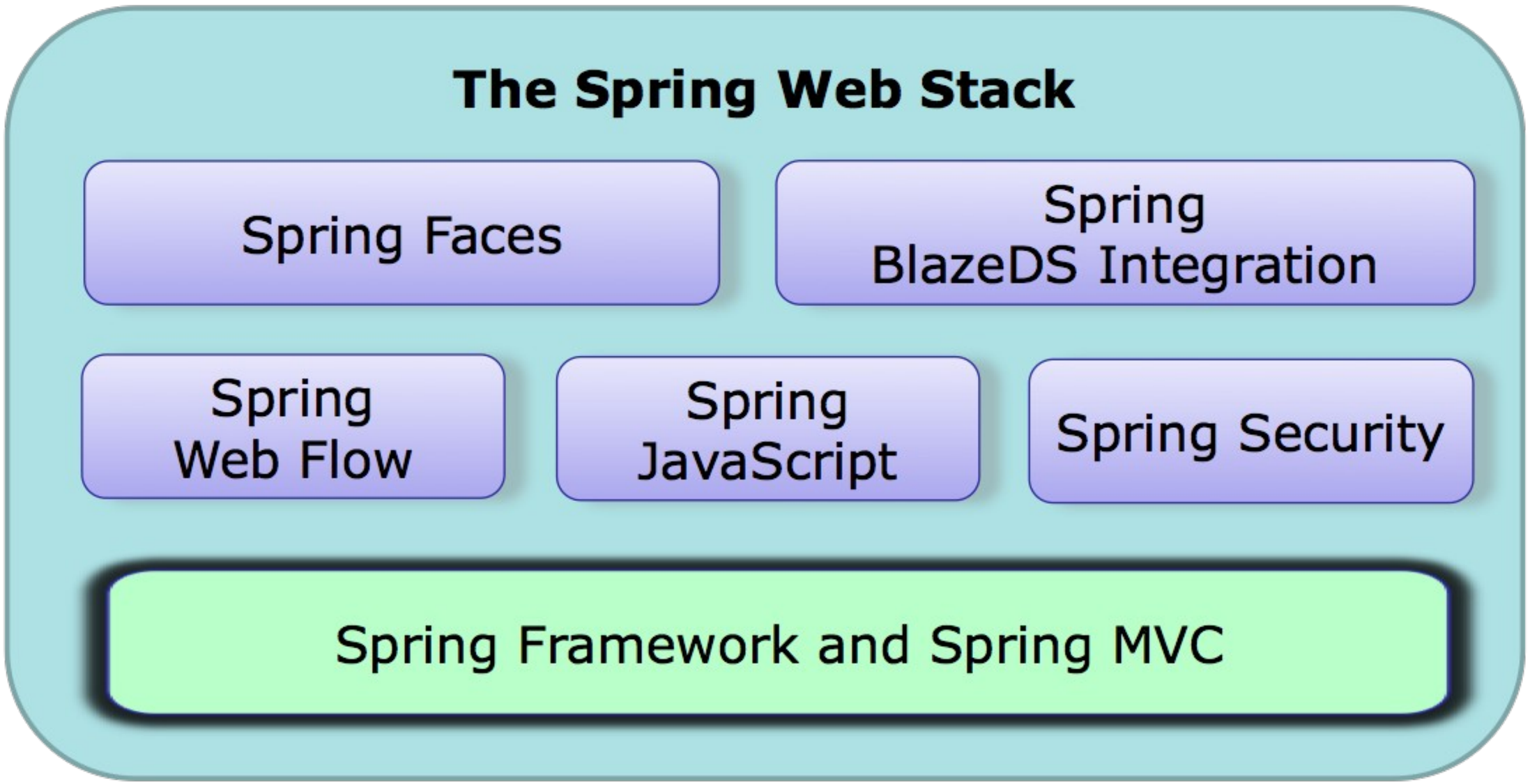
Web Stack Components

- Spring Framework and Spring MVC
  - The foundational web MVC platform
- Spring JavaScript
  - Ajax and JavaScript / JSON integration
- Spring Web Flow
  - Framework for stateful web conversations

Web Stack Components (cont.)

- Spring Security
  - Security framework
- Spring Faces
  - Integration with JavaServer Faces
- Spring BlazeDS Integration
  - Integration with Adobe Flex™ clients

Spring Framework / MVC



RESTful @MVC

- RESTful @MVC is the preferred controller model for Spring MVC 3.0
  - Promotes organization of services around logical resources
    - Java™@Controllers control access to resources
    - @Controllers delegate to views to render resource representations

Key Elements of REST in @MVC

- URI Templates
  - map unique URLs to resources
- Uniform Interface
  - honor the semantics of HTTP verbs
- Content Negotiation
  - provide multiple representations of a resource

URI Templates

- URI templates supported through use of @RequestMapping and @PathVariable

http://springsource.com/travel-app/hotels/1

```
@RequestMapping(“/hotels/{id}”, method = GET)
public Hotel show(@PathVariable Long id) {
    return bookingService.findHotelById(id);
}
```

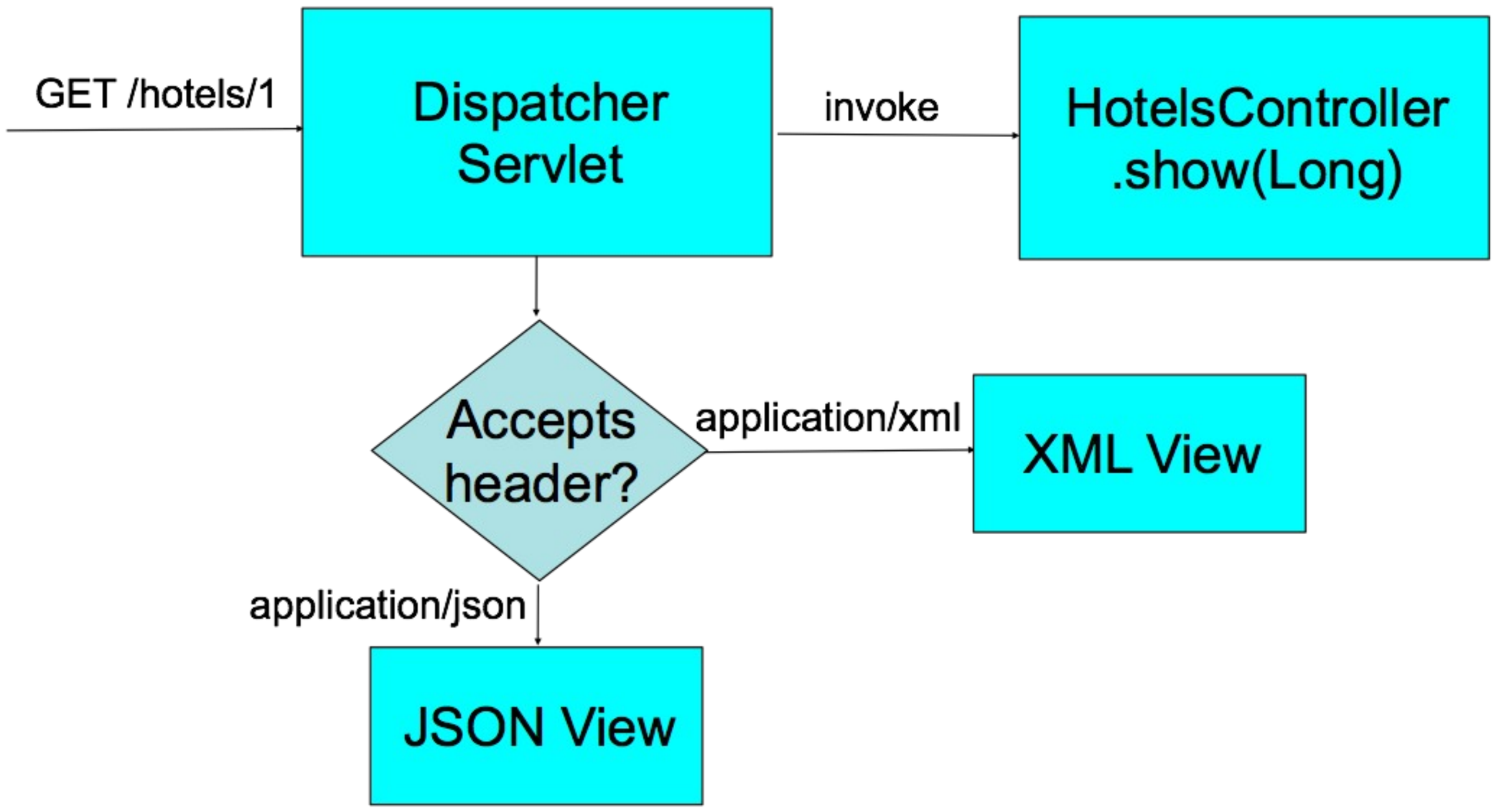
Uniform Interface

- HTTP verbs supported in @RequestMapping
  - GET - retrieves representation of a resource
  - POST - creates a new resource as a child of another
    - Response-Location header returns URI of newly created resource
  - PUT - updates a resource or creates a new resource when the target URI is known
  - DELETE - deletes a resource

Content Negotiation

- Access resource through representations
- More that one representation possible
  - HTML, XML, JSON, PDF, ATOM/RSS, etc
  - Content negotiation figures out the right one for a given request
- Desired representation specified in Accept header or via file extension
- Delivered representation shown in Content-Type

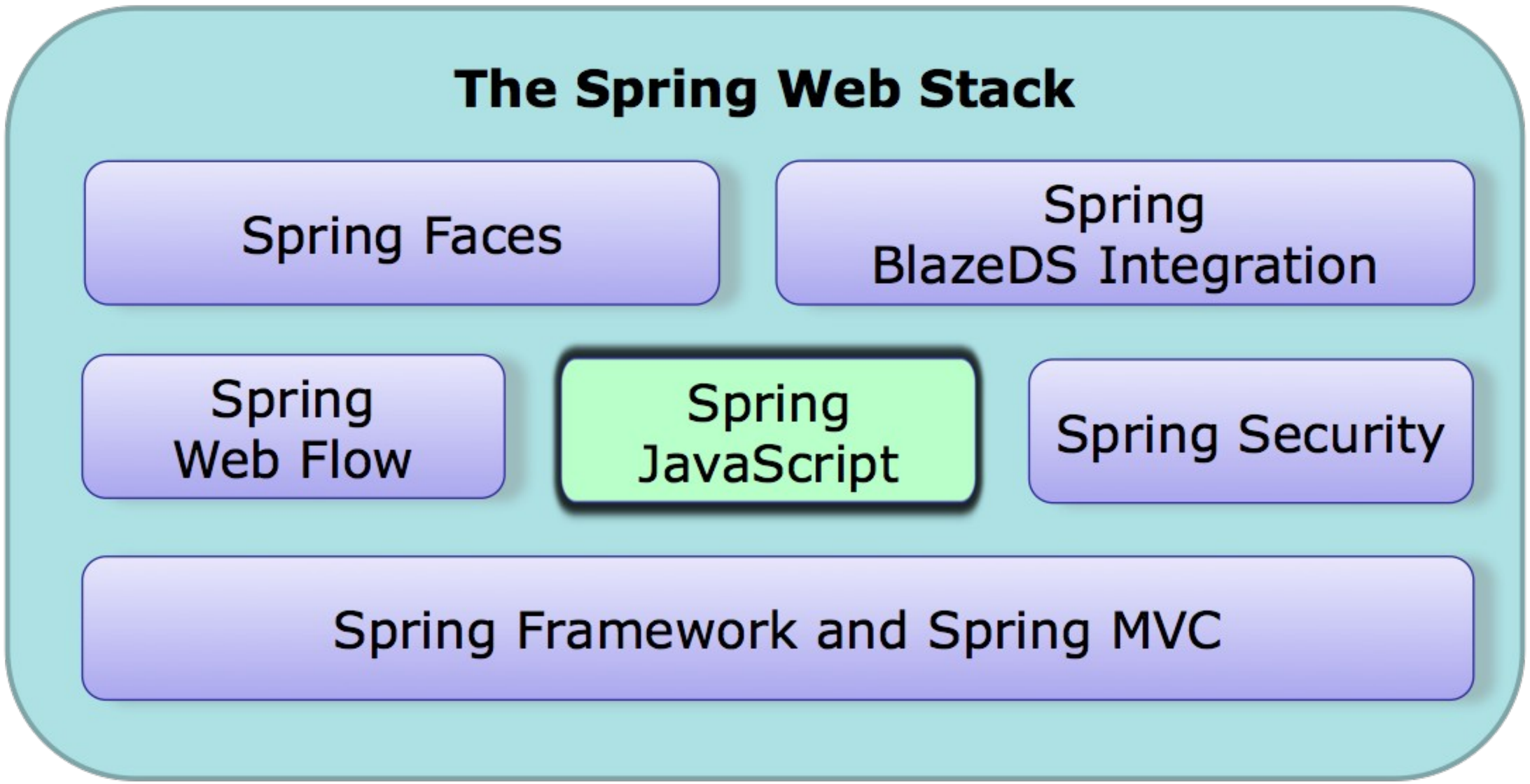
Content Negotiation



Demo

RESTful @MVC

Spring JavaScript



Spring JavaScript

- JavaScript abstraction framework
  - Use to enhance HTML elements with rich behavior
- Integrates the Dojo Toolkit
- Provides JSON support
  - Jackson-based JsonView implementation
- Promoted to top-level project for Spring 3.0

Goals of Spring JavaScript

- Encapsulate use of Dojo for common enterprise use cases
  - Ajax
  - Rich widgets such as a data grid
  - Client-side validation
- Promotes progressive enhancement
  - Robust in the face of JavaScript failure
  - Maximizes potential audience
  - Accessibility

Working with the Spring JavaScript API

- Use API to apply decorations to HTML elements
- Different types of decorations
  - WidgetDecoration
  - AjaxEventDecoration
  - ValidateAllDecoration

Ajax with Partial Rendering

```
<a id="moreResultsLink" href="search?q=$
   {criteria.q}&page=${criteria.page+1}">
  More Results
</a>
<script type="text/javascript">
  Spring.addDecoration(new Spring.AjaxEventDecoration({
    elementId: "moreResultsLink",
    event: "onclick",
    params: {
      fragments: "searchResults"
    }
  }));
</script>
```

Name of tile to re-render on server

No callback function necessary to link in response

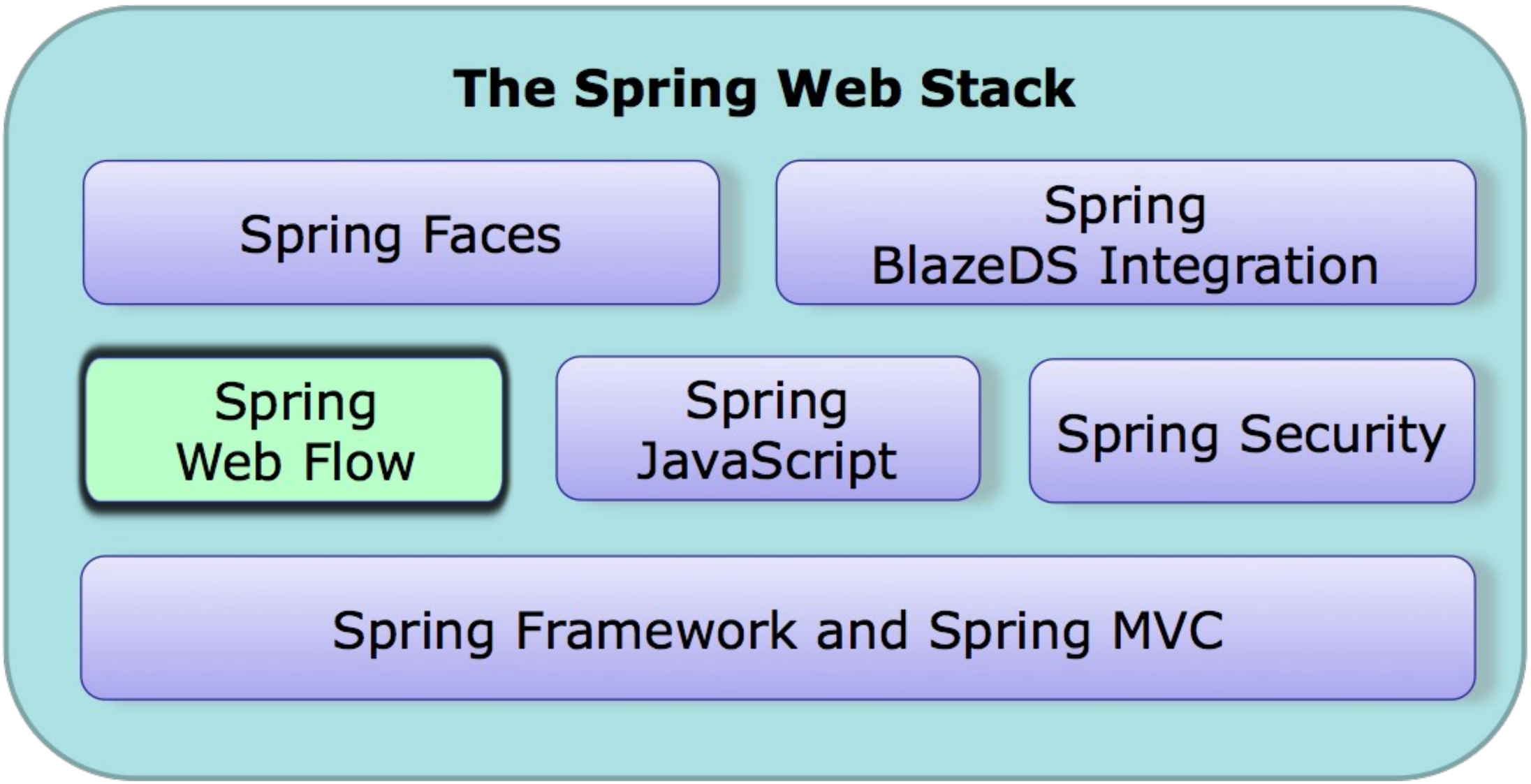
Form Validation

```
<form:input path="creditCard"/>
<script type="text/javascript">
  Spring.addDecoration(new Spring.ElementDecoration({
    elementId : "creditCard",
    widgetType : "dijit.form.ValidationTextBox",
    widgetAttrs : {
      required : true,
      invalidMessage : "A 16-digit number is required.",
      regExp : "[0-9]{16}”
    }
  }));
</script>
```

Demo

Spring JavaScript Client with JSON-based REST interface

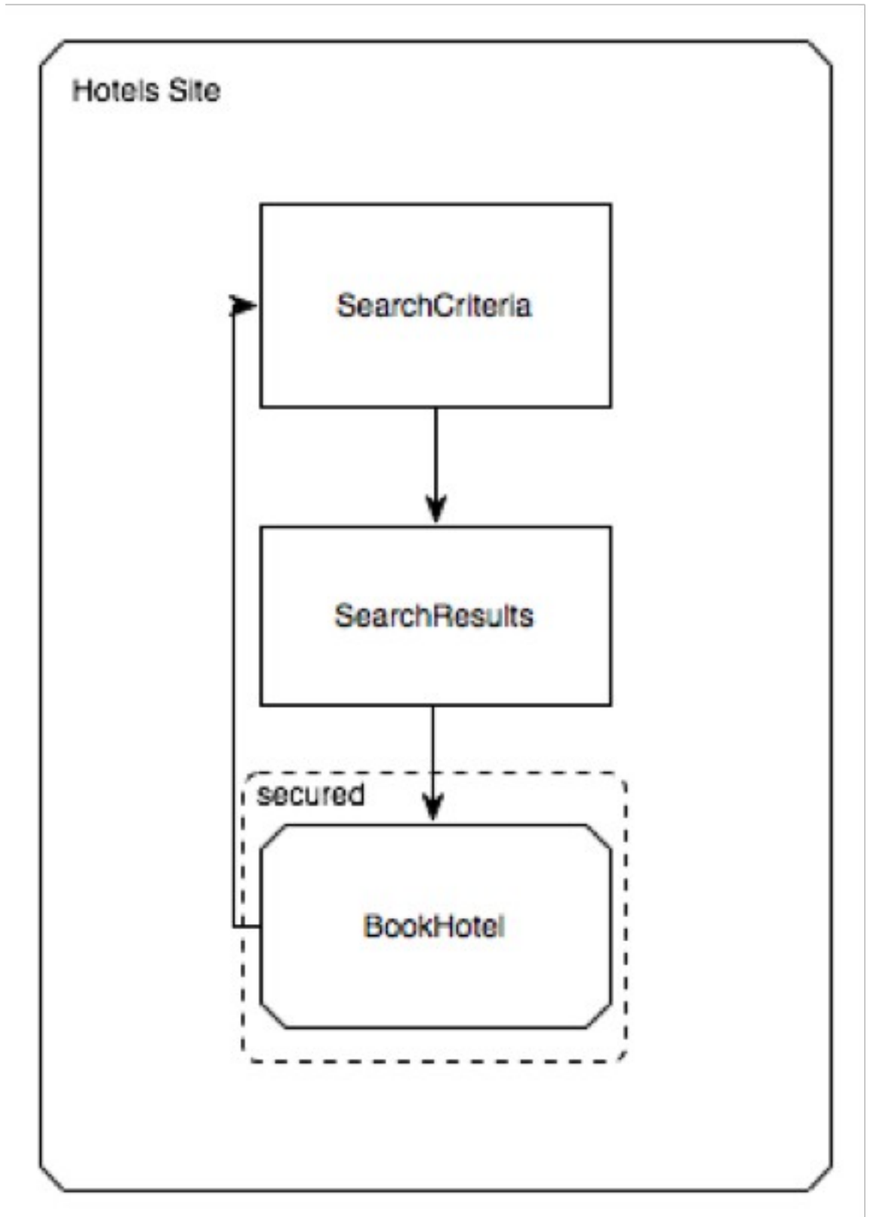
Spring Web Flow

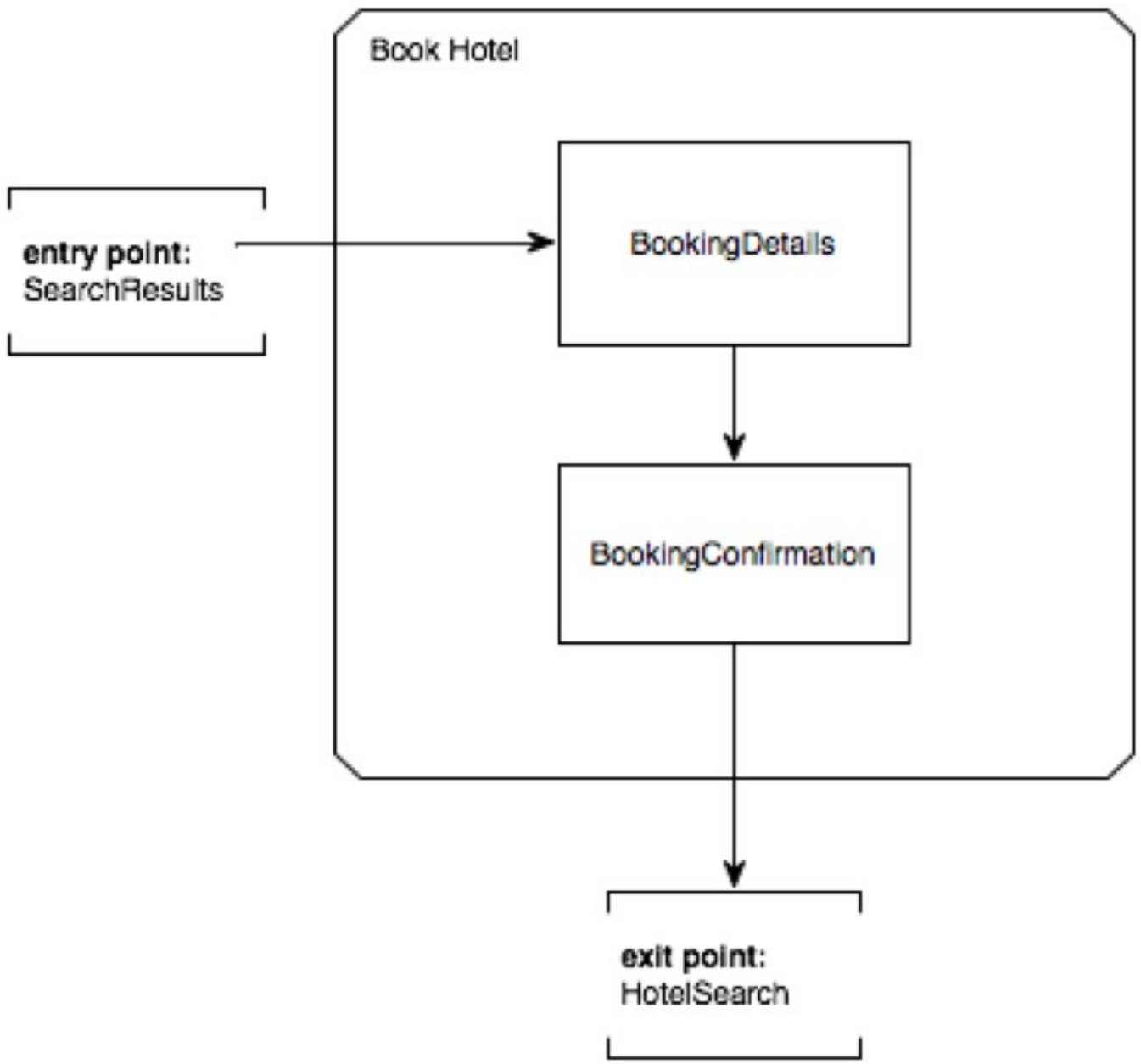


Spring Web Flow

- For implementing stateful flows
  - Reusable multi-step user dialogs
- Plugs into Spring MVC
- Spring Web Flow 2 current release
  - Incorporates lessons learned from 1.0
  - Offers many new features

Web Flow Sweet Spot





New Web Flow 2 Features

- Ajax support
  - Partial page re-rendering in flow DSL
- Spring security integration
- Flow-managed persistence
- Convention-over-configuration
  - View rendering
  - Data binding and validation

Spring Web Flow 3 - @Flow

- Extends @Controller model
- Define stateful UI flow control using plain Java™
- Builds on Spring Web Flow infrastructure
- Part of Web Flow project

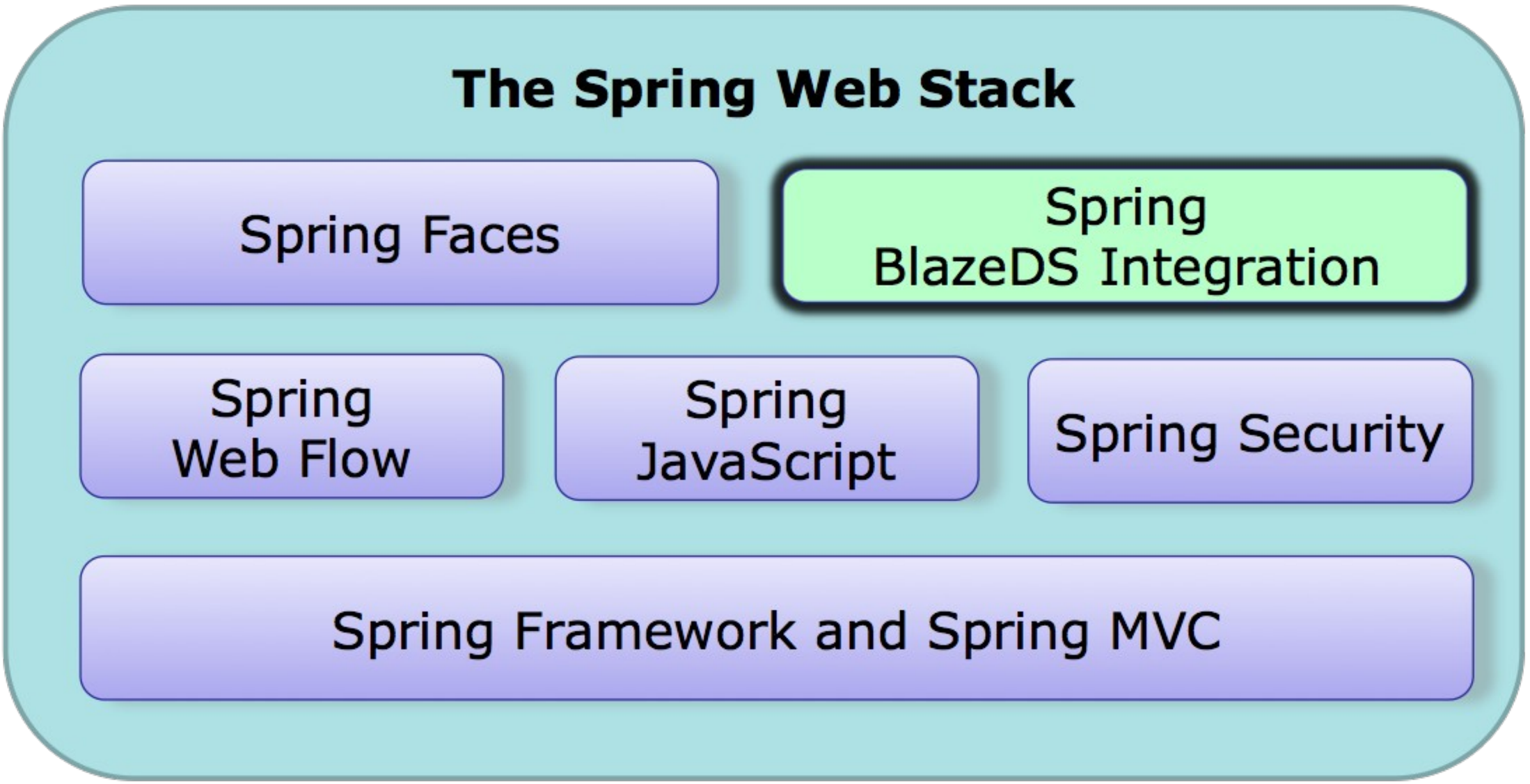
@Flow Example

```
@Flow
public class BookHotel {
   private Booking booking;
   @Autowired private transient BookingService booking;

   public State start(@Input Long hotelId, Principal user) {
      booking = bookingService.createBooking(hotelId, user);
      return new EnterBookingDetails();
   }

   private class EnterBookingDetails extends ViewState {
      @Transition
      State next() { return new ReviewBooking() };
   }

   private class ReviewBooking extends ViewState {}
```

Demo

Integrating Stateful Web Conversations

Spring BlazeDS Integration



Spring BlazeDS Integration

- Spring's Adobe Flex integration project
  - Connects Flex clients to Spring-managed services
    - Using BlazeDS MessageBroker boot-strapped by Spring
- Makes Flex natural fit in a Spring environment
  - Uses Spring XML namespace for simplified setup
  - Reduces the need for BlazeDS-specific config

Spring BlazeDS Integration

- Expose Spring beans as Remoting destinations (for RPC style interaction)
  - <flex:remoting-destination>
- Message-style communication through native BlazeDS messaging, JMS, and Spring Integration channels
  - enables server-side push
- Integrate Spring Security to secure Flex apps
  - <flex:secured>

Demo

Consuming Spring Services with RIA Clients

Summary

- Apply a REST-ful approach to your web application development
  - Think about your app as a set of resources
  - With potentially multiple representations to support different client types
- Spring provides robust web stack for implementing REST-ful web apps
  - A-la carte open-source components
  - Integration with an array of web technologies
- Have fun!

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Thank You

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