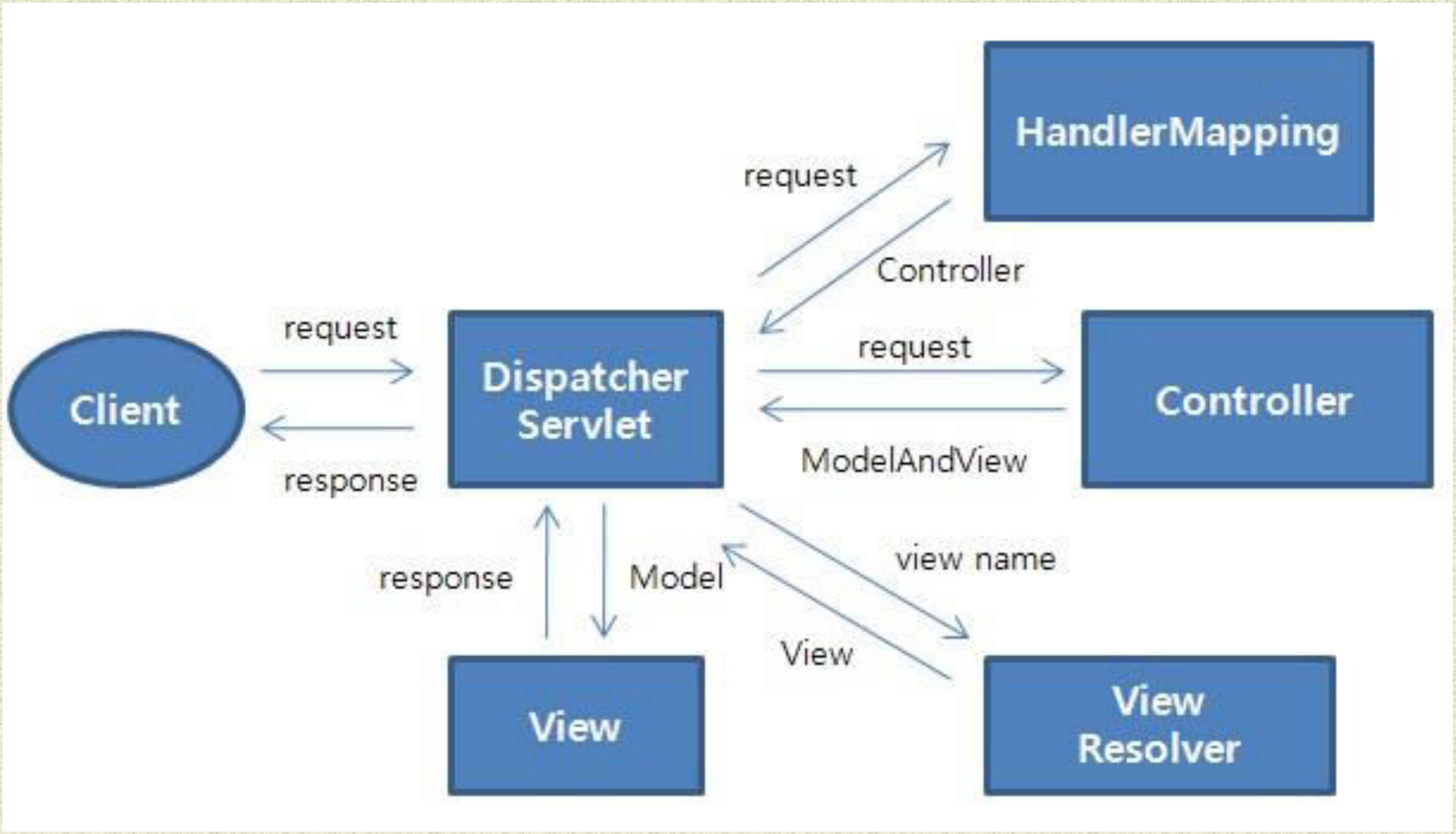
View Resolvers & Views & Upload & Exceptions & Internationalization & Tiles
Harmonizing Diversity

Spring MVC Flow



Spring MVC View Resolvers

- Flexible View Resolving Mechanism
- Resolve logical String-based view names to View types.
- Many out-of-the-box implementations[examples]:

1. **UrlBasedViewResolver**-This directly resolves a view name to a URL without any explicit mapping. The view names can be the URL themselves or a prefix or suffix can be added to get the URL from the view name.
2. **InternalResourceViewResolver**-This is a subclass of UrlBasedViewResolver. Out-of-the-box support for JSP
3. **FreeMarkerViewResolver**-This is a subclass of UrlBasedViewResolver that supports FreeMarkerView and its subclasses.
4. **VelocityViewResolver**-This is a subclass of UrlBasedViewResolver that supports VelocityView and its subclasses.
5. **ContentNegotiatingViewResolver**-This is an implementation of a view resolver based on the request file name or Accept header – mime-type. This class delegates view resolution to other view resolvers that are configured.

Multiple View Resolvers Configuration

```
<!-- lower order value has a higher priority -->
<bean
class="org.springframework.web.servlet.view.InternalResourceViewResolver">
<property name="prefix" value="/WEB-INF/views/" />
<property name="suffix" value=".jsp" />
<property name="order" value="3" />
</bean>

<bean id="viewResolver“
class="org.springframework.web.servlet.view.freemarker.FreeMarkerViewResolver“
>
    <property name="cache" value="true"/>
    <property name="prefix" value=""/>
    <property name="suffix" value=".ftl"/>
<property name="order" value="2" />
</bean>
```

Spring MVC Views

- Spring has flexible view support through the View Interface class
- Out-of-the-box view support for:

JspView	- InternalResourceViewResolver	
JSON	- ContentNegotiatingViewResolver	**
XML	- ContentNegotiatingViewResolver	**
PDF	- ContentNegotiatingViewResolver	**
Excel	- ContentNegotiatingViewResolver	**
Tiles	- TilesViewResolver	
Velocity	- VelocityViewResolver	
FreeMarker	- FreeMarkerViewResolver	
Redirect	- InternalResourceViewResolver	
Forward	- InternalResourceViewResolver	

** “Candidates”

Resolving Image files for uploading

- HTTP multipart request is used by browsers to upload files/data to the server
- Spring good support HTTP multipart request:
  - CommonsMultipartResolver

DispatcherServlet XML config:

```
<bean id="multipartResolver"
class="org.springframework.web.multipart.commons.CommonsMultipartResolver">
  <property name="maxUploadSize" value="10240000"/>
</bean>
```

JSP:

```
<form:form  modelAttribute="newProduct" class="form-horizontal"
      enctype="multipart/form-data">
```

Content-Type: multipart/form-data

```
<form:input id="productImage" path="productImage" type="file"
class="form:input-large" />
```

Resolving Image files for uploading[Cont.]

- Saving image in Controller:

```
• MultipartFile productImage = productToBeAdded.getProductImage();
• String rootDirectory =
        request.getSession().getServletContext().getRealPath("/");

• if (productImage!=null && !productImage.isEmpty()) {
•   try {
•    productImage.transferTo(new File(rootDirectory+"resources\\images\\"+
                             productToBeAdded.getProductId() + ".png"));
•   } catch (Exception e) {
•   throw new RuntimeException("Product Image saving failed", e);
```

Main Point

- Spring MVC Views and View Resolvers offers a variety of ways to manage the presentation of data. *Life is the expression of the field of all possibilities resulting in a veritable explosion of variety in nature*

Handler Exception Resolver

- HandlerExceptionResolver interface
  - Used to resolve exceptions during Controller mapping & execution

  Two Default implementations [”out of the box”]:

    - ResponseStatusExceptionResolver – supports @ResponseStatus
    - ExceptionHandlerExceptionResolver – supports @ExceptionHandler

Exceptions can be handled EITHER individually OR Globally across ALL Controllers with @ControllerAdvice “interceptor”

ResponseStatusExceptionResolver handled “individually”

- Marks a method or exception class with the status code and reason that should be returned. “Customizes” exceptions as HTTP status codes
- The status code is applied to the HTTP response when the handler method is invoked, or whenever said exception is thrown.

@ResponseStatus Example Generates a 404 message:

```
@ResponseStatus(value=HttpStatus.NOT_FOUND,
                 reason="No products found under this category")
public class NoProductsFoundUnderCategoryException extends
RuntimeException{
```

ProductController:

```
if (products == null || products.isEmpty()) {
        throw new NoProductsFoundUnderCategoryException();
}
```

ExceptionHandlerExceptionResolver

- Method identified as ExceptionHandler for exception resolution

- Could reside in EITHER ProductController OR @ControllerAdvice

```
• @ExceptionHandler(ProductNotFoundException.class)
• public ModelAndView handleError(HttpServletRequest req,
        ProductNotFoundException exception) {
        ModelAndView mav = new ModelAndView();
        mav.addObject("invalidProductId", exception.getFullMessage());
        mav.setViewName("productNotFound");
•       return mav;
• }
```

- New JSP: productNotFound.jsp

```
• <h1 class="alert alert-danger"> ${invalidProductId}</h1>
```

Product Not Found Exception

```
• public class ProductNotFoundException extends RuntimeException{
• private String message = "No product found with the product ID = ";
• private String productId;

• public ProductNotFoundException(String productId, String message) {
    • this.productId = productId;
    • if (message != null) this.message = message;
• }
• public String getFullMessage() {
• return (message + productId);
• }
• public String getProductId() {
      return productId;
• }
```

@ControllerAdvice

- Indicates the annotated class assists a "Controller“
- Works across ALL controllers

- It is typically used to define @ExceptionHandler, @InitBinder, and @ModelAttribute methods that apply to all @RequestMapping methods.

- @ControllerAdvice
- **public class ControllerExceptionHandler {**

- Handles exceptions….

Test Exception

- **Product Controller "dummy" URL:**
- `@RequestMapping(value = "/throw", method = RequestMethod.GET)`
- `public String throwException(@ModelAttribute("newProduct") Product newProduct) {`

- `String productId = "B1234";`
- `Product product = productService.getProductById(productId);`
- `if(product == null) {`
- `throw  new ProductNotFoundException(productId, null);`
- `}`

Main Point

- A well-defined exception and error handling approach is important for simplifying the development of web applications. *The removal of obstacles is an important aspect of the process of evolution.*

Internationalization

- i18n – ‘i’+ 18 chars + ‘n’ == internationalization
- Support for multiple languages & data format with code rewrite
- Examples:

zh	Chinese	nl	Dutch
hi	Hindi	el	Greek
ja	Japanese	fr	French

- L10n = ‘l’+10 chars + ‘n’ = localization
- Support locale-specific [geographic/region/country] information

Egypt	EG	Libya	LY	China	CN
India	IN	Taiwan	TW		
Mynmar	MM	Mongolia	MN		

Java Locale class

- Locale(String language)
- Locale(String language, String Country)
- Locale(String language, String Country, String variant)

- Variant is browser specific code [windows, MAC, etc.]

- Message are stored in ".properties files indicating Locale
- E.g. messages_zh.properties
- Optionally messages_zh_CN.properties

Locale Resolvers

- Browser's Accept-Language header

```
<bean id="localeResolver"
class="org.springframework.web.servlet.i18n.AcceptHeaderLocaleResolver">
  <property name="defaultLocale" value="en"/>
</bean>
```

- Session
  - uses a locale attribute in the user's session

```
<bean id="localeResolver"
  class="org.springframework.web.servlet.i18n.SessionLocaleResolver">
  <property name="defaultLocale" value="en_US"/>
</bean>
```

- Cookie
  - uses a cookie sent back to the user

```
bean id="localeResolver"
  class="org.springframework.web.servlet.i18n.CookieLocaleResolver">
  <property name="defaultLocale" value="en_US"/>
</bean>
```

LocaleChangeInterceptor

- Used to handle Cookie or Session locale resolvers AUTOMATICALLY

```
• <mvc:interceptors>
     <bean class=
         "org.springframework.web.servlet.i18n.LocaleChangeInterceptor">
      <property name="paramName" value="language"/>
     </bean>
• </mvc:interceptors>
```

This is the parameter that the interceptor looks for...

Tiles

- **Composite View Pattern**

    create pages using a consistent structure

    pages share the same layout

    individual pages differ in segments

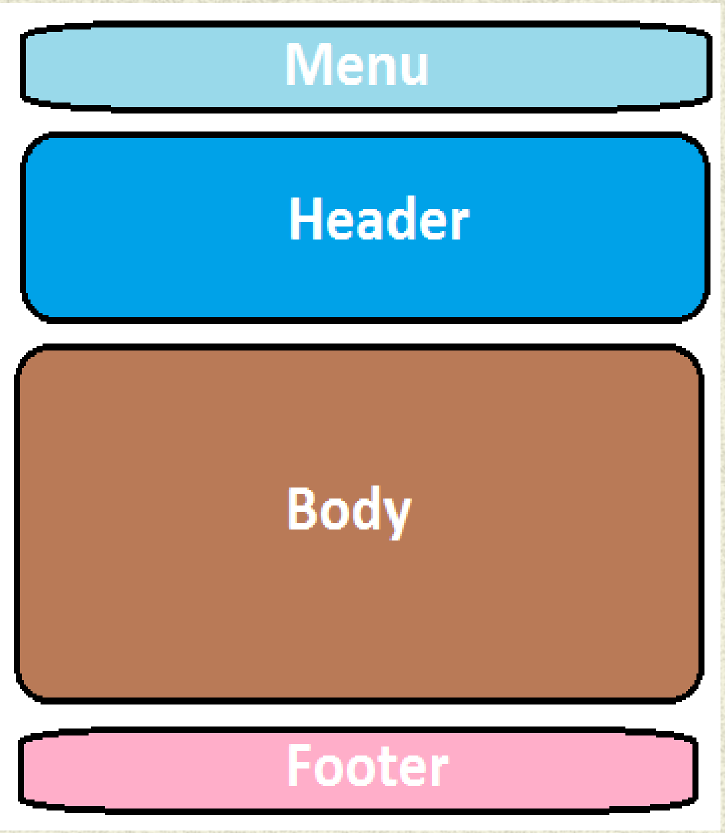
    segment placement maintains positional consistency across all the site.

Tiles Configuration

```
<bean id="tilesViewResolver"
    class="org.springframework.web.servlet.view.UrlBasedViewResolver">
  <property name="viewClass"
      value="org.springframework.web.servlet.view.tiles3.TilesView" />
  <property name="order" value="-2" />
</bean>
```

```
    <bean id="tilesConfigurer"
   class="org.springframework.web.servlet.view.tiles3.TilesConfigurer">
        <property name="definitions">
            <list>
             <value>
               /WEB-INF/tiles/definitions/tile-definition.xml
             </value>
            </list>
        </property>
   </bean>
```

Sample baseLayout.jsp Template



```
<title><tiles:insertAttribute name="title" />
<body>
   <ul class="nav nav-pills pull-right">
    <tiles:insertAttribute name="menu" />
   </ul>
   <h3 class="text-muted">Web Store</h3>

   <h1>
    <tiles:insertAttribute name="header" />
   </h1>
   <p>
      <tiles:insertAttribute name="subHeader" />
   </p>

   <div class="row">
     <tiles:insertAttribute name="body" />
   </div>

   <div class="footer">
    <tiles:insertAttribute name="footer" />
   </div>
</body>
```

Example Tiles Definition File

- <tiles-definitions>

```
        <definition name="baseLayout"
                template="/WEB-INF/tiles/template/baseLayout.jsp">
        <put-attribute name="title" value="Sample Title" />
        <put-attribute name=“menu"
                value="/WEB-INF/tiles/template/navigation.jsp" />
        <put-attribute name="header" value="" />
        <put-attribute name="subHeader" value="" />
        <put-attribute name=“body" value="" />
        <put-attribute name="footer"
                value="/WEB-INF/tiles/template/footer.jsp" />
```

- </definition>

Example Tiles Pages

- <definition name="welcome" extends="baseLayout">
- <put-attribute name="title" value="Welcome" />
- <put-attribute name="header" value="Internationalization" />
- <put-attribute name=“body" value="/WEB-INF/views/welcome.jsp" />
- </definition>

- <definition name="products" extends="baseLayout">
- <put-attribute name="title" value="Products" />
- <put-attribute name="header" value="Products" />
- <put-attribute name=“subHeader" value="Available Products" />
- <put-attribute name=“body" value="/WEB-INF/views/products.jsp" />
- </definition>

Main Point

- All websites have something in common: they are made of pages that share similar structures. *A facet of SCI is that Order is found everywhere*