Sling Models in AEM

(by Ankur Chauhan)

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1. **What are Sling Models?**
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“Sling models are pure Plain Old Java Objects (POJO), which are automatically mapped from Sling objects, typically resource and request objects. We can also inject OSGi Services in these models as well.”

Design Goals

- These are "Pure" POJOs.
- Use standard annotations where possible.
- OOTB, support resource properties (via ValueMap), SlingBindings, OSGi services, request attributes
- Adapt multiple objects - minimal required Resource and SlingHttpServletRequest
- Client doesn't know/care that these objects are different than any other adapter factory
- Support both classes and interfaces.
- Work with existing Sling infrastructure (i.e. not require changes to other bundles).

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- Using Sling Models you can do more with less code
- You can reduce your coding efforts.
- Your code is more maintable using Sling Modes.
- You don't have to write redundent code.

It is more understandable using a live scenario. (Native Ecommerce API in AEM)

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Dependency Required

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- You can find all the Sling Models Injectors at ***http://localhost:4502/system/console/status-slingmodels***
- Maven dependecy for your project can be found at-

Dependency Required

- It depends on your AEM version so best way is to find this dependency at your on AEM instance for that you can search for – ***org.apache.sling.models***
  in felix console bundles tab. Or
- Go to Felix Console packages tab And search for ***org.apache.sling.models.annotations.Model*** it you will get the Maven dependency for your project.

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- Go to Felix Console packages tab And search for ***org.apache.sling.models.annotations.Model*** it you will get the Maven dependency for your project.

```
<dependency>
        <groupId>org.apache.sling</groupId>
        <artifactId>org.apache.sling.models.api</artifactId>
        <version>1.0.0</version>
        <scope>provided</scope>
</dependency>
```

- Now add this dependency to your project.
- Search for ***maven-scr-plugin*** in your parent pom.xml file.
- Update it with

```
<plugin>
        <groupId>org.apache.felix</groupId>
          <artifactId>maven-bundle-plugin</artifactId>
          <extensions>true</extensions>
          <configuration>
              <instructions>
                  <Sling-Model-Packages> sling.models </Sling-Model-Packages>
                  <Bundle-Category>sling-model-demo</Bundle-Category>
              </instructions>
          </configuration>
</plugin>
```

- This plugin modification is mandatory so that this header must be added to the bundle's manifest file.

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Annotations

- @Model
- @Inject
- @Optional
- @Default
- @Named
- @PostConstruct
- @Via
- @Source
- @Required
- List<Resource> list.

Before starting with these annotations, Let's have a look on this line of code.

resource.adaptTo(ValueMap.class);

In this code snippet -

- **resource** will behaves as an **adaptable**
- **ValueMap** behaves as an **adapter**

Code Snippet Part - I

```
@Model(adaptables = Resource.class )
public class ResourceValues {
    ...
}
```

Code Snippet Part - I

```
@Model(adaptables = Resource.class )
public class ResourceValues {

    @Inject       // If defined then Resource must have this property else it will return null.
    private String firstName;
}
```

Code Snippet Part - I

```
@Model(adaptables = Resource.class )
public class ResourceValues {

    @Inject       // If defined then Resource must have this property else it will return null.
    private String firstName;

    /* To provide default value to this string for Strings & primitives, Default only works with
        @Inject annotation not with @Optional annotation.   */
    @Inject @Default(values="defaultValue")
    private String lastName;
}
```

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        @Inject annotation not with @Optional annotation.   */
    @Inject @Default(values="defaultValue")
    private String lastName;

     /*  If the field or method name doesn't exactly match the property name */
    @Inject @Named("secondPropertyName")
    private String otherName;
}
```

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@Model(adaptables = Resource.class )
public class ResourceValues {

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    private String firstName;

    /* To provide default value to this string for Strings & primitives, Default only works with
       @Inject annotation not with @Optional annotation.   */
    @Inject @Default(values="defaultValue")
    private String lastName;

     /*  If the field or method name doesn't exactly match the property name */
    @Inject @Named("secondPropertyName")
    private String otherName;

    @Optional // If defined then Resource may or may not have property.
    private String fullName;
}
```

Question?

Is it required to add this @optional annotation at every field, if want to make is optional?

Answer ?

*Yes, if you are using Sling API version before 1.0.2 and after this version you get another property in **@Model** annotation named as **defaultInjectionStrategy**.* After adding this property all the fields are by default ***@optional***.
But if you wnat some field as required then you have to add ***@required*** annotation on that field.

This property is defined in ***@Model*** annotation and it's syntex is-

@Model(adaptables=Resource.class,defaultInjectionStrategy=DefaultInjectionStrategy.OPTIONAL)

Code Snippet Part - II

How to use Sling Models in AEM?

```
ResourceValues resourceValues = resource.adaptTo(ResourceValues.class)
```

Code Snippet Part - II

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```
ResourceValues resourceValues = resource.adaptTo(ResourceValues.class)
```

How to use in JSP?

```
<sling:adaptTo adaptable="${resource}" adaptTo="org.apache.sling.models.it.models.MyModel"
var="model"/>
```

Code Snippet Part - II

How to use Sling Models in AEM?

ResourceValues resourceValues = resource.adaptTo(ResourceValues.class)

How to use in JSP?

<sling:adaptTo adaptable="${resource}" adaptTo="org.apache.sling.models.it.models.MyModel" var="model"/>

How to use in Sightly?

${sling:adaptTo(resource, 'org.apache.sling.models.it.models.MyModel')}

Code Snippet Part - III

```
@Model(adaptables = Resource.class)
public class ResourceValues {
    /* Child List injection works after Sling version 1.0.6.
        This List injection will hold list of all the child nodes present under childs node under
        current resource.
    */
    @Inject
    private List<Resource> childs;
}
```

Code Snippet Part - III

```
@Model(adaptables = Resource.class)
public class ResourceValues {
    /* Child List injection works after Sling version 1.0.6.
        This List injection will hold list of all the child nodes present under childs node under
        current resource.
    */
    @Inject
    private List<Resource> childs;

    /*
       The @PostConstruct annotation can be used to add methods which
        are invoked upon completion of all injections
    */
    @PostConstruct
    protected void sayHello() {
        System.out.println("post construct is working");
    }
}
```

Code Snippet Part - IV

```
@Model(adaptables=SlingHttpServletRequest.class)
public interface RequestValues {

    /* will return
     request.getResource().adaptTo(ValueMap.class).get("propertyName", String.class)
    */
    @Inject @Via("resource")
    String getPropertyName();

}
```

Means:-

“If the injection should be based on a JavaBean property of the adaptable, you can indicate this using the @Via annotation”

Code Snippet Part - V

```
@Model(adaptables=SlingHttpServletRequest.class)
public interface RequestValues {

    /* Ensure that "resource" is retrived from the bindings, not a request attribute */
    @Inject @Source("script-bindings")
    Resource getResource();
}
```

Questions??

References:

[Sling Model Documentation]