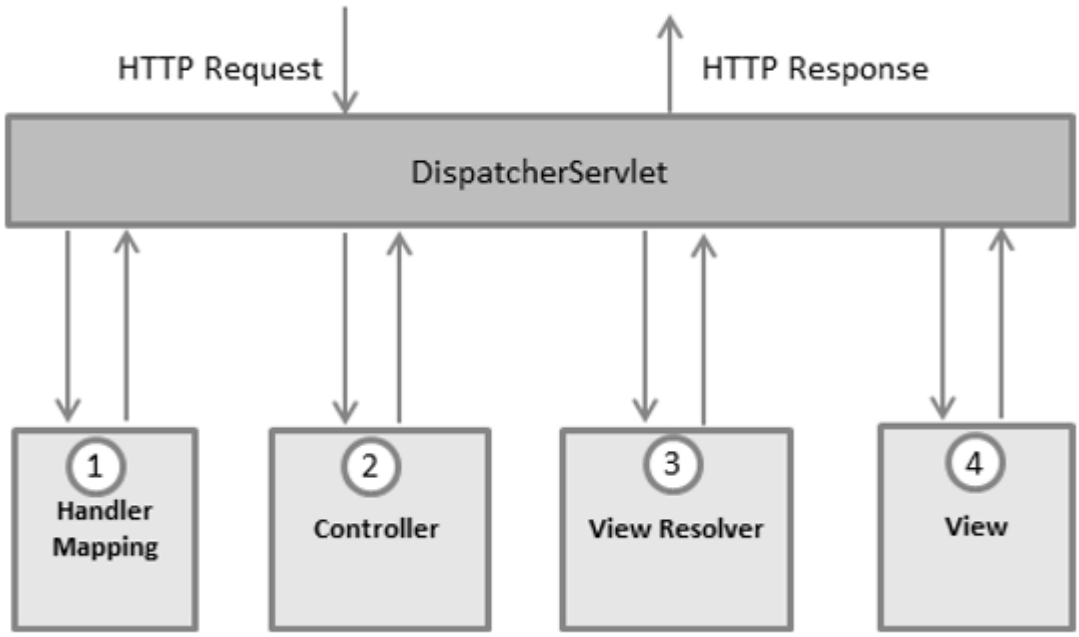
The Spring Web MVC framework provides Model-View-Controller (MVC) architecture and ready components that can be used to develop flexible and loosely coupled web applications. The MVC pattern results in separating the different aspects of the application (input logic, business logic, and UI logic), while providing a loose coupling between these elements.

- The **Model** encapsulates the application data and in general they will consist of POJO.
- The **View** is responsible for rendering the model data and in general it generates HTML output that the client's browser can interpret.
- The **Controller** is responsible for processing user requests and building an appropriate model and passes it to the view for rendering.

The DispatcherServlet

The Spring Web model-view-controller (MVC) framework is designed around a *DispatcherServlet* that handles all the HTTP requests and responses. The request processing workflow of the Spring Web MVC *DispatcherServlet* is illustrated in the following diagram −



Following is the sequence of events corresponding to an incoming HTTP request to *DispatcherServlet* −

- After receiving an HTTP request, *DispatcherServlet* consults the *HandlerMapping* to call the appropriate *Controller*.
- The *Controller* takes the request and calls the appropriate service methods based on used GET or POST method. The service method will set model data based on defined business logic and returns view name to the *DispatcherServlet*.
- The *DispatcherServlet* will take help from *ViewResolver* to pickup the defined view for the request.
- Once view is finalized, The *DispatcherServlet* passes the model data to the view which is finally rendered on the browser.

All the above-mentioned components, i.e. HandlerMapping, Controller, and ViewResolver are parts of *WebApplicationContext* w which is an extension of the plain*ApplicationContext* with some extra features necessary for web applications.

Required Configuration

You need to map requests that you want the *DispatcherServlet* to handle, by using a URL mapping in the **web.xml** file. The following is an example to show declaration and mapping for **HelloWeb** *DispatcherServlet* example −

```
<web-app id = "WebApp_ID" version = "2.4"
   xmlns = "http://java.sun.com/xml/ns/j2ee"
   xmlns:xsi = "http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation = "http://java.sun.com/xml/ns/j2ee
   http://java.sun.com/xml/ns/j2ee/web-app_2_4.xsd">

   <display-name>Spring MVC Application</display-name>

   <servlet>
      <servlet-name>HelloWeb</servlet-name>
      <servlet-class>
         org.springframework.web.servlet.DispatcherServlet
      </servlet-class>
      <load-on-startup>1</load-on-startup>
   </servlet>

   <servlet-mapping>
      <servlet-name>HelloWeb</servlet-name>
      <url-pattern>*.jsp</url-pattern>
   </servlet-mapping>

</web-app>
```

The **web.xml** file will be kept in the WebContent/WEB-INF directory of your web application. Upon initialization of **HelloWeb** DispatcherServlet, the framework will try to load the application context from a file named **[servlet-name]-servlet.xml** located in the application's WebContent/WEB-INFdirectory. In this case, our file will be **HelloWebservlet.xml**.

Next, <servlet-mapping> tag indicates what URLs will be handled by which DispatcherServlet. Here all the HTTP requests ending with **.jsp** will be handled by the **HelloWeb** DispatcherServlet.

If you do not want to go with default filename as *[servlet-name]-servlet.xml* and default location as *WebContent/WEB-INF*, you can customize this file name and location by adding the servlet listener *ContextLoaderListener* in your web.xml file as follows −

```
<web-app...>

   <!-------- DispatcherServlet definition goes here----->
   ....
   <context-param>
      <param-name>contextConfigLocation</param-name>
      <param-value>/WEB-INF/HelloWeb-servlet.xml</param-value>
   </context-param>

   <listener>
      <listener-class>
         org.springframework.web.context.ContextLoaderListener
      </listener-class>
   </listener>

</web-app>
```

Now, let us check the required configuration for **HelloWeb-servlet.xml** file, placed in your web application's *WebContent/WEB-INF* directory −

```
<beans xmlns = "http://www.springframework.org/schema/beans"
   xmlns:context = "http://www.springframework.org/schema/context"
   xmlns:xsi = "http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation = "http://www.springframework.org/schema/beans
   http://www.springframework.org/schema/beans/spring-beans-3.0.xsd
   http://www.springframework.org/schema/context
   http://www.springframework.org/schema/context/spring-context-3.0.xsd">

   <context:component-scan base-package = "com.tutorialspoint" />

   <bean class = "org.springframework.web.servlet.view.InternalResourceViewResolver">
      <property name = "prefix" value = "/WEB-INF/jsp/" />
      <property name = "suffix" value = ".jsp" />
   </bean>

</beans>
```

Following are the important points about **HelloWeb-servlet.xml** file −

- The *[servlet-name]-servlet.xml* file will be used to create the beans defined, overriding the definitions of any beans defined with the same name in the global scope.
- The *<context:component-scan...>* tag will be use to activate Spring MVC annotation scanning capability which allows to make use of annotations like @Controller and @RequestMapping etc.
- The *InternalResourceViewResolver* will have rules defined to resolve the view names. As per the above defined rule, a logical view named **hello** is delegated to a view implementation located at */WEB-INF/jsp/hello.jsp* .

The following section will show you how to create your actual components, i.e., Controller, Model, and View.

Defining a Controller

The DispatcherServlet delegates the request to the controllers to execute the functionality specific to it. The **@Controller**annotation indicates that a particular class serves the role of a controller. The **@RequestMapping** annotation is used to map a URL to either an entire class or a particular handler method.

```
@Controller
@RequestMapping("/hello")
public class HelloController {
   @RequestMapping(method = RequestMethod.GET)
   public String printHello(ModelMap model) {
      model.addAttribute("message", "Hello Spring MVC Framework!");
      return "hello";
   }
}
```

The **@Controller** annotation defines the class as a Spring MVC controller. Here, the first usage of **@RequestMapping** indicates that all handling methods on this controller are relative to the **/hello** path. Next annotation**@RequestMapping(method = RequestMethod.GET)** is used to declare theprintHello() method as the controller's default service method to handle HTTP GET request. You can define another method to handle any POST request at the same URL.

You can write the above controller in another form where you can add additional attributes in *@RequestMapping* as follows −

```
@Controller
public class HelloController {
   @RequestMapping(value = "/hello", method = RequestMethod.GET)
   public String printHello(ModelMap model) {
      model.addAttribute("message", "Hello Spring MVC Framework!");
      return "hello";
   }
}
```

The **value** attribute indicates the URL to which the handler method is mapped and the **method** attribute defines the service method to handle HTTP GET request. The following important points are to be noted about the controller defined above −

- You will define required business logic inside a service method. You can call another method inside this method as per requirement.
- Based on the business logic defined, you will create a model within this method. You can use setter different model attributes and these attributes will be accessed by the view to present the final result. This example creates a model with its attribute "message".
- A defined service method can return a String, which contains the name of the **view** to be used to render the model. This example returns "hello" as logical view name.

Creating JSP Views

Spring MVC supports many types of views for different presentation technologies. These include - JSPs, HTML, PDF, Excel worksheets, XML, Velocity templates, XSLT, JSON, Atom and RSS feeds, JasperReports, etc. But most commonly we use JSP templates written with JSTL.

Let us write a simple **hello** view in /WEB-INF/hello/hello.jsp −

```
<html>
   <head>
      <title>Hello Spring MVC</title>
   </head>

   <body>
      <h2>${message}</h2>
   </body>
</html>
```

Here **${message}** is the attribute which we have set up inside the Controller. You can have multiple attributes to be displayed inside your view.