## [Course Overview](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb)

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[Hi, everyone.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=5.34) [My name is Bryan Hansen, and welcome to my course, Spring MVC Fundamentals.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=6.64) [I'm the director of software development at Software Technology](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=11.25) [Group and the CEO of Complete Programmer.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=14.17) [Spring MVC is a full‑featured yet lightweight Java framework that](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=17.42) [has taken the web development space by storm. Spring's](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=21.06) [integration is excellent with just about any other Java tooling,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=24.42) [and Spring MVC is no exception.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=27.37) [In this course we're going to cover the fundamentals of Spring MVC.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=29.43) [We will cover all the major parts of Spring MVC,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=33.94) [including container and containerless deployments,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=36.51) [both standard controllers and REST controllers,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=39.53) [JSP pages and the Spring alternative, Thymeleaf,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=42.51) [as well as consuming Spring MVC from client‑side JavaScript.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=45.84) [By the end of this course,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=50.25) [you should feel comfortable developing with Spring MVC. Before](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=51.38) [beginning the course, you should be familiar with Java,](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=55.31) [and although not necessary, some Maven experience will help.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=57.76) [From here, you should feel comfortable diving into Spring with courses](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=62.01) [on Spring security, Spring data JPA using Hibernate, or having a better](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=65.32) [understanding of architectural design through the design patterns in](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=70.17) [Java courses here on Pluralsight. I hope you'll join me on this journey](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=73.41) [to learn Spring MVC with the Spring MVC Fundamentals Course, here at Pluralsight.](https://app.pluralsight.com/course-player?clipId=b596884d-df80-42a5-ae1f-a040f7a218cb&startTime=77.46)

## [What Is Spring MVC?](https://app.pluralsight.com/course-player?clipId=f61e8a03-27e7-46c9-bcfc-2e16f4252df7)

### [Version Check](https://app.pluralsight.com/course-player?clipId=f61e8a03-27e7-46c9-bcfc-2e16f4252df7)

### [Introduction](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba)

[Just as Spring took the Java development space by storm,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=1.02) [Spring MVC was equally as successful in the web space.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=4.95) [When I originally wrote this course for Pluralsight,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=9.04) [Spring MVC was just as popular as any of the other](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=11.62) [frameworks that were out there.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=14.78) [But since then, it's become the standard for Java web development.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=16.7) [Let's talk more about why and how it's used today because it's](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=20.56) [use has changed quite a bit over the years.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=23.4) [The first release of this course was centered around](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=26) [strictly front‑end development.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=28.74) [Most Java web apps at the time were written using JavaServer Pages for the](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=31.01) [front end and had a very simple controller‑based architecture.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=34.69) [Later, people started looking for an alternative to SOAP services,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=39.46) [and out came the REST service support in Spring MVC. REST support early](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=42.46) [on was quite simple, and Spring previously had a stance that they didn't](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=47.38) [want to try and support all of the features of REST and just the two](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=51.15) [most common ones, GET and POST.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=54.83) [It has since become very full featured and easy to even expose](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=58.01) [endpoints from your data or model tier if you want.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=62.05) [As JavaScript‑heavy front ends took over, it was only a](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=65.81) [matter of time that single‑page applications,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=69.19) [or SPAs,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=71.97) [started to dominate the front‑end space. Spring MVC's full‑fledged REST](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=72.97) [support made it a great service layer for SPA apps.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=77.58) [Throughout this course,](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=81.44) [we're going to look at all three of these scenarios and how to use them inside of your applications.](https://app.pluralsight.com/course-player?clipId=9e14f4e4-5ba5-4783-bcab-f45743e8e9ba&startTime=82.32)

### [Course Update](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e)

[Spring's architecture is a traditional model‑view‑controller design pattern.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=1.04) [Since it does follow this methodology,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=6.42) [it's adaptable to many scenarios in which we can develop apps.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=8.62) [We have a module for each of the parts of this pattern throughout the course,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=12.64) [but to give you a brief introduction,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=16.64) [the view can be a simple REST service or JSP page and can handle more](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=18.14) [complex scenario such as compiling those JSPs and even work with various](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=24.03) [third‑party templating tools and frameworks.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=27.87) [The controller is the same regardless of what the front](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=30.79) [end or back end that we're using is.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=33.68) [It's all written using Spring beans and configured just like any Spring bean.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=35.99) [The back end, much like the front end,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=40.74) [can be swapped out with various persistent strategies, JPA, Hibernate,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=42.63) [JDBC, even non‑relational databases.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=47.84) [Spring has support for them.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=50.83) [One thing that is different now than when we originally released this course](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=52.71) [is that all of this can be figured with or without XML.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=56.34) [Upon the initial release of this course,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=60.84) [there was a lot of debate between existing frameworks out there and](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=63.12) [which to use. Simplifying this course with the update,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=66.58) [we opted out of discussing these comparisons of those various frameworks.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=70.42) [One thing that has changed, though,](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=75.19) [is the number of apps now being completely self contained or apps](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=77.37) [being developed without XML at all. Specifically, the lack of](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=81.54) [web.XML or with later servlet specifications, any XML at all.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=85.68) [Showing the difference of this approach will be the main focus in](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=90.93) [the update of this course, while showing you that model‑view‑controller design pattern.](https://app.pluralsight.com/course-player?clipId=0fd8ff76-8775-4539-abfe-c60b2efba75e&startTime=94.02)

### [Request / Response Lifecycle](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984)

[The request/response life cycle is actually a tricky one when you look at it.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=1.11) [The big scope of everything that's going on here seems](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=6.02) [a little bit overwhelming at first.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=9.01) [We have an incoming request that hits our front controller,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=11.23) [that's just our dispatcher servlet inside of Spring,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=15.76) [and that hands off the request and delegates our request over](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=19.02) [to one of the controllers that we've set up.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=22.18) [So the dispatcher is just the router that comes in and says](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=24.15) [what controller's going to handle it?](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=27.87) [I'm going to delegate this request over to that controller over there.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=30.59) [The controller just routes traffic to where it's supposed to go.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=35.87) [So it says, I'm going to handle that request and hand it over to the back end.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=40.22) [Now our back end could be composed of web services or](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=44.94) [a database or multiple databases,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=48.88) [any number of things that we're gathering data from.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=52.15) [And in turn what that does is it hands back a model object to us.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=54.86) [So it creates that model and hands it back.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=59.49) [The model is basically just our data,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=62.68) [what we're trying to represent on our screen.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=65.29) [Once that gets back to the controller, the controller says okay,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=68.44) [I'm going to let somebody else now do the rendering.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=71.79) [And the rendering is separate from the business logic.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=75.02) [So we have this model‑view‑controller design pattern,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=78.69) [and everything is doing its own specified functionality here.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=81.49) [So coming back to the controller, we have our model now,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=85.64) [or our data that we're going to try and represent the UI with.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=88.16) [So we go back to our front controller and it says, oh,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=92.51) [well, now who's going to handle this?](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=95.09) [Who's going to render this response?](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=97.08) [Let's pass our model down to some view template.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=99.6) [For this course we're going to use JSP,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=102.84) [but we also are going to look at examples using Thymeleaf.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=105.01) [There's many other different technologies that integrate nicely](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=109.84) [with Spring MVC as well that you could use.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=113.17) [Once it's gone to our view template, our JSP page,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=116.01) [we're going to return control back to the front controller and](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=119.3) [then return back our response to the browser.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=123.2) [Now this whole thing is kind of divided up into three different parts.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=125.94) [We have our model,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=129.2) [so where we get our model created and the data associated with it,](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=130.14) [our views, so our representing view, and our controller.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=135.24) [That's where our model‑view‑controller is coming into play with our entire application.](https://app.pluralsight.com/course-player?clipId=a4ae0bc4-f04d-4684-9b4c-a239ec8a8984&startTime=139.18)

### [Vocabulary](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5)

[Before we get too far into our application,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=1.04) [let's get some simple vocabulary out of the way.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=3.79) [First, we're going to start with a SPA or a single page application.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=6.89) [You've probably heard of that before, but if you haven't,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=10.58) [most people refer to a single page application as a SPA.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=13.05) [The next piece is a DispatcherServlet.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=18.33) [This is our entry point into our application,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=21.68) [and it's really where a Spring MVC web app begins its configuration.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=24.33) [We always start with the dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=29.9) [Then we have a controller.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=33.24) [The controller is actually an implementation of the command pattern handler.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=34.62) [If you really want to understand architecture and](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=39.85) [understand the design behind this,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=42.82) [you can go look up the command pattern design pattern and read more about it,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=44.67) [but the controllers are always an implementation of a command pattern handler.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=49.49) [The next piece that we have is a request mapping.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=54.94) [Everything inside of Spring MVC is associated with a request mapping,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=56.89) [and that's the URL, and the type of request that we're making to our application.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=63.03) [Next, we have view resolvers.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=69.1) [View resolvers are used to locate the view and to serve it back up.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=71.09) [Now, a view resolver can be used to find a template or a JSP page or HTML page,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=76.63) [or serve up a RESTful service.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=83.5) [Then we'll talk about our servlet‑config.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=87.44) [Now this used to be a web.xml file coupled with a servlet‑config.xml file,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=90.01) [and now we're going to talk about how all of this is now](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=99.09) [configured using Java configuration.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=102.15) [And then there is, of course, POJOs, plain old Java objects.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=105.54) [Everything inside of Spring, all Spring beans are just simple POJOs,](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=108.95) [which is just a basic class that follows the bean specification of](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=113.41) [a no‑arguments constructor with getters and setters named](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=117.99) [appropriately, and that is the definition of a Spring bean as well;](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=121.26) [it's just a Spring configured POJO.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=126.19) [So when you talk about a Spring bean, it is just a POJO that's](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=128.52) [been configured and implemented inside of Spring.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=132.81) [Let's look at the application that we're going to be building throughout this course now.](https://app.pluralsight.com/course-player?clipId=b39396a1-1fae-48b4-bdf7-c15473b29cf5&startTime=137.5)

### [What Are We Going to Build?](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8)

[We're going to build a conference application that has a](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=1) [registration object that we do some validation on.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=4.74) [We're going to show you how to build the controllers associated](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=8.25) [with those and what that code looks like.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=11.18) [It's where it's handling all the errors for it and navigation.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=13.91) [We're going to solve complex problems using the Post/Redirect/Get](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=17.74) [pattern and just show you basic internationalization throughout the](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=22.42) [application. So things will be internationalized where it'll work in](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=26.72) [either English or Spanish.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=31.42) [And you can add other languages to that resource bundle.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=33.22) [We'll also dive into how to handle the dependencies that are in there and show](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=37.24) [you how to start your application using Spring Boot and move out of that into a](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=42.02) [standard Java configuration using the Boot starter and then overriding things](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=48.64) [through customizations inside of your app.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=54.58) [It really goes into all of the details without getting too](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=57.14) [cumbersome in your project about how and what we should do and](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=60.85) [what Spring will do for us by convention and what we want to override through configuration.](https://app.pluralsight.com/course-player?clipId=638d2eef-5f32-47b6-afac-1bbc1d6dc7e8&startTime=66.39)

### [Summary](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276)

[To quickly recap what we learned in this module,](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=1.04) [we looked at what Spring can do for us, and that is your front‑end technologies,](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=3.68) [RESTful services.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=10.37) [Even if you're building a spy application, Spring MVC has got you covered.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=11.75) [We went through the model‑view‑controller design pattern and](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=16.54) [talked about how Spring is really a good,](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=19.64) [clean, pure implementation of that as far as a web project is concerned.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=22.43) [We also talked about that there's not going to be a focus of XML in this course.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=26.74) [The new standard is to have everything configured in Java.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=30.9) [It's great for existing applications to have XML,](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=34.41) [but the industry has kind of chosen a Java‑first, XML‑second](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=37.2) [approach, and that's our focus in this course.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=42.52) [And we picked apart the complex request response lifecycle](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=45.18) [and showed you how these pieces all tie into that](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=49.61) [model‑view‑controller design pattern.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=52.09) [We briefly covered some vocabulary,](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=54.54) [and then we showed you a quick glimpse of what we're building. Now, let's go ahead and dive into creating our first application with Spring.](https://app.pluralsight.com/course-player?clipId=a337fbbd-072e-4fd8-bd77-3ca57f5fd276&startTime=57.09)

## [Creating Your First Spring MVC Application](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202)

### [Introduction](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202)

[It may or may not be your first Spring MVC application,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=1.04) [but in this module, we're going to cover how to build an application.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=4.47) [There is more than one approach to using Spring,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=8.73) [but I often see people pick one and never understand](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=11.39) [the benefit of the other approach.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=14.45) [I'm speaking specifically about using Spring standalone or](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=16.62) [using Spring Boot to initialize your app.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=19.91) [We're actually going to cover both in this module,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=22.74) [but before we do,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=25.06) [let's look at the prerequisites for getting started](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=26.43) [regardless of which approach we use.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=28.64) [I'm going to use Java 11 in this course,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=32.44) [and we picked Java 11 because it's the current release](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=34.76) [with specific LTS or long‑term support.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=37.78) [Java 12 has been released and 13 is on the cusp of being released,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=41.17) [but those versions don't have long‑term support for Java.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=45.18) [I'm assuming that you already know how to install Java so we](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=50.64) [won't be covering that in this course,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=53.38) [and I'm also going to use Maven in this course as well.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=55.38) [Spring no longer offers up a way to download just the jars and forces you](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=58.88) [to use Maven or Gradle to download those dependencies.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=62.74) [If you are a little bit confused or concerned about the use of Maven,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=66.71) [there is a Pluralsight course on Maven.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=69.71) [If you have more questions about that, you can research and follow it.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=72.64) [The next thing you'll need is an IDE.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=76.74) [This course has now been updated to use IntelliJ.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=78.82) [We got feedback that the majority of our users wanted to](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=81.65) [see and use examples with IntelliJ, so we've changed the course to use it.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=84.31) [And finally, Tomcat.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=89.54) [A change from the previous release of this course though is that we're](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=91.34) [going to show you both of the approaches of deploying as a WAR and as a](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=94.76) [self‑contained app with its own packaged server,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=99.34) [basically, Java 11, the latest version of Maven,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=102.94) [and IntelliJ A, and we will show both with and without Tomcat deployments.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=106.75) [Speaking of IntelliJ, I'm going to be using the ultimate edition.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=113.49) [The ultimate edition is actually a paid version,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=118.24) [but there are a couple ways to go about this.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=121.42) [First, it is free for students.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=124.19) [Second, there is a trial with it.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=126.84) [And third,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=129.02) [a lot of students I speak with actually have it paid for by their company.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=129.7) [If all else fails,](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=133.94) [all the examples we are going through will work with Spring STS.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=135.21) [If you need help configuring them with a different IDE, reach out on the forum, and we'll try to help you there.](https://app.pluralsight.com/course-player?clipId=9ed9908b-3271-4ae5-85d5-4fa425af6202&startTime=139.27)

### [Getting Spring](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b)

[One of the reasons for re‑releasing this course was because Spring quit](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=1) [offering a direct download for the compiled jars.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=5.08) [Sure, there are ways to obtain it,](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=9.24) [but nothing is simple as just clicking a link on their project page.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=10.84) [With some of my older courses,](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=14.54) [people had asked for it just to focus on one technology and](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=16.53) [not use supporting tools such as Maven.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=20.51) [Well, like it or not, Spring wants you to download their tools using Maven.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=23.17) [It will be simple for this course, though,](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=28.13) [and candidly,](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=29.97) [any project of moderate complexity should be using Maven](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=30.8) [or Gradle to manage its dependencies.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=34.04) [The Maven repo has the source, Javadocs,](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=37.09) [and binaries all available for download.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=39.91) [One of the main reasons Spring wants you to use Maven is because of the](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=43.24) [transitive dependencies that are required to run projects.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=46.75) [We're going to start off by setting up our app to use Spring](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=50.81) [Boot and then add in the features that Spring Boot doesn't](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=54.4) [offer out of the basic configuration.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=57.29) [Let's get our app configured and use Maven to download those defenses that our app will require now.](https://app.pluralsight.com/course-player?clipId=46fb5784-7e65-42ec-9ded-340b7e84dd3b&startTime=60.21)

### [Demo: Project Setup](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619)

[To get started with setting up our project,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=1.19) [I've gone ahead and opened up a browser and gone to start.spring.io,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=3.5) [and it pulls up this page.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=9.35) [We're going to start off by first selecting the type of project.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=10.95) [We want a Maven project, and the language we're going to choose is Java.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=14.3) [And the current release of Spring Boot is 2.2.4, which I have chosen here.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=18.34) [And then I'm going to change the project metadata](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=24.44) [to the group of com.pluralsight.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=26.72) [And the demo name, I'm going to change that artifact to now be conference,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=30.08) [since we're building a conference app,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=38.8) [as we saw in that earlier demo in the previous module.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=41.11) [I'm going to name the artifact conference,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=44.01) [and this has some other things that will change in the pom for us by doing so.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=45.94) [I'm going to select to drop down those options.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=51.43) [You'll see the name again.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=54.11) [Should be the same as the artifact.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=56.83) [We can leave the description the same,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=59.33) [or if you want to put something more significant there,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=61.4) [I'm fine with that.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=64) [The reason,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=65.43) [though, that mainly I chose to expand the options is to make](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=66.22) [sure that the packaging type is currently Jar.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=69.68) [I'm going to show you what happens when we change that to a War later.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=72.55) [But I want to specifically choose Java 11.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=75.71) [So you'll notice that they have versions 13, 11, and 8 in here.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=79.33) [We want to choose 11, and as I mentioned in the prerequisites section,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=83.75) [that's because it's the current version that has long‑term support.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=87.13) [Now, before we get too anxious and skip out of here,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=90.6) [we want to go down here to this Search dependencies to add and choose Web,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=93.83) [or search for web, and click the plus sign.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=98.59) [And when you've done this,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=101.34) [you should see it expand over to the right saying Spring Web,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=102.08) [Build Web, including RESTful applications using Spring MVC.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=106.4) [And it includes the bundled or embedded Tomcat container,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=110.99) [which is what we want to start with as well.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=115.72) [Now that we have this in here, let's go ahead and click the Generate,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=118.07) [and it will download that for us,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=122.99) [and we can now go over and expand that in our file space.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=125.05) [When it downloads that,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=128.82) [it'll actually name the ZIP file the same name as what we had called](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=130.81) [our artifact in the start.spring.io initializer.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=135.91) [I'm going to double‑click on this and just expand it.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=141.52) [And now we can open up IntelliJ and have it import that project in.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=145.34) [When we first open IntelliJ,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=151.74) [we're presented with this splash screen asking us if](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=153.4) [we want to create our project, import it, just open it,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=156.32) [or get it from Version Control.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=160.13) [Since we used start.spring.io,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=162.11) [we want to import our project because it was already created for us.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=165.01) [So let's select Import Project.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=169.09) [You want to choose the home directory of that application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=171.31) [I store mine underneath dev/workspace/spring‑mvc/conference,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=174.54) [so I'm going to choose conference.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=178.49) [And you'll notice there's the src folder here and the](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=181.5) [pom.xml and some Maven command stuff.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=184.76) [Go ahead and choose Open.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=187.94) [And then it will ask us if we want to finish importing that from Eclipse,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=189.6) [Flash Builder, Gradle, or Maven.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=193.7) [We want to choose Maven and click Finish. And it will go](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=195.6) [ahead and load up the application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=200.26) [Now, The first time you do this,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=202.55) [it's going to resolve some dependencies and spend a](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=203.76) [minute scanning all those files, indexing them,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=206.82) [bringing them all into your workspace. Behind the scenes it's actually](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=210.04) [going out and grabbing everything from the Maven repo.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=214.15) [And you'll see the little progress indicator in the lower‑right portion](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=218.48) [of your screen is it goes ahead and does this for you.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=221.25) [It's downloading a bunch of stuff. And if you haven't used Maven](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=224.13) [before, it may take it a minute. So now we should have a project](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=227.78) [structure in here. And inside of our project structure, we should](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=232.16) [have our src/main/java app,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=236.38) [and underneath that it should contain our package structure](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=241.04) [and our actual conference application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=244.14) [We can open it up and see that it's just a basic](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=246.45) [configured Spring Boot application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=250.34) [And then outside of here,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=254.22) [we also have our pom file and we have our resources directory.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=255.54) [Right now there's really nothing contained inside of here.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=259.99) [If we go back to this conference application and right‑click on main,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=263.6) [we can run this application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=268.8) [It will bring up our build window for us and tell us that it's](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=270.43) [building all of our code and everything else,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=275.11) [and then it will fire up the server. And we're up and running now. So](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=277.28) [now our actual app is deployed and running on 8080.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=282.37) [Let's pull up our browser and see what it looks like the first time we hit it.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=286.69) [The first time that you pull up your app in a web page,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=290.75) [you're going to get this nice, ugly Whitelabel Error Page,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=295.39) [basically making you think you've done something wrong. And](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=299.5) [really what it is, we don't have an index.html page or anything](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=303.12) [else configured in our application yet.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=306.65) [So the basic project that gets downloaded and the structure that](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=309.03) [gets supplied for your app has no greeting page.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=312.28) [Let's switch back over to our IDE and fix that now so we have at least](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=316.31) [something nice to greet us as we go into the app.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=319.77) [We need to do a couple of things to add that index page to our application.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=322.63) [First, let's go over to our src/main/resources/static directory,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=327.5) [right‑click on it, and say New, HTML File. And we can select HTML5 file.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=332.87) [It should already be selected for us.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=340.54) [We'll just go ahead and give it a name of index.html. Click Enter.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=343.6) [This will give us a standard.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=348.74) [page. I'm going to change the title to Index. And inside the body,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=350.93) [I'm just going to add an H1 so that we have a nice big](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=355.2) [greeting or hello for us to land on here.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=359.94) [So we can save that. Now the other thing that we need to do is, we](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=363.39) [actually need to restart our server, and this seems a little odd. Where](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=367.27) [things were all self‑contained in a JAR, that file hasn't been](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=372.11) [repackaged up and moved over to the server yet. Once we have deployed](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=376.06) [files and have a reference to them,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=380.79) [we can change them without always redeploying them.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=382.63) [But if it's never been deployed to that server, it won't work.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=385.93) [So I'm going to go ahead and click that redeploy button and have it restart](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=389.41) [our application for us and switch back over to our browser.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=394.01) [Now let's see what this page looks like when we refresh it.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=399.4) [Hey, we have our Hello, just like we expected it to.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=403.51) [So a quick recap of what we did there.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=407.34) [We went out to start.spring.io and downloaded a bundled‑up Spring Boot](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=409.67) [application for us, expanded that to our file server.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=415.87) [Then we went ahead and imported that into our IDE,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=419.89) [deployed it, launched the application,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=424.52) [seeing that it had an error page for us, went back in](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=427.38) [under src/main/resources/static,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=432.17) [added our index.html, and then came back to reverify that](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=434.7) [it displayed like we thought it should.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=440.32) [Pretty simple, but there are a few steps to do,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=442.69) [and if it's new to you,](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=445.48) [it may seem a little overwhelming. And we're going to break that down through the next few examples.](https://app.pluralsight.com/course-player?clipId=973f7054-1237-45d4-9004-8244b6d27619&startTime=446.52)

### [Demo: Tomcat Configuration](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0)

[Our previous example displayed static pages as a fully](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=1.04) [self‑contained Spring Boot application, and that works very well,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=5.5) [and it works fine if you want to just go ahead and use RESTful services too.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=10.91) [But deploying JSP pages,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=15.38) [which a lot of you may be watching this course to migrate](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=17.5) [and existing application or maintain an existing](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=21.58) [application and have to use JSP pages, they actually still work great,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=24.32) [but Spring Boot self‑contained JARs don't do well with them.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=30.54) [In fact,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=35.92) [Spring will caution you in their documentation to not](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=36.61) [deploy your application as a fully self‑contained JAR and](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=40.68) [as a Spring Boot application.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=46.32) [So let's go ahead now and look at converting that to a packaged](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=48.2) [WAR and deploying that on a Tomcat server.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=52.16) [To get an instance of Tomcat for us to use for our project,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=57.2) [I'm going to go ahead and open up a browser and navigate to tomcat.apache.org,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=60.81) [and then we can go down to the Download section on the left here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=66.64) [And if you're not sure which version you want to use,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=69.43) [there is a link that you can navigate to and read](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=71.48) [about all the different versions.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=74.27) [But for Java 11 and what we're doing, we want to use Tomcat 9.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=75.4) [So I'm going to click on that, and scroll down a little bit,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=79.73) [and click the Core zip version, and it will download for me.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=82.98) [And let's expand that ZIP file.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=88.77) [I like to do that in my DevTools directory, and here's my downloaded ZIP file.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=90.63) [As I mentioned,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=96.41) [I like to have all of my tools under a DevTools directory](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=97.61) [where I've got multiple versions of Maven,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=102.17) [and Tomcat, and those types of things,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=105.56) [any of the things I'm messing around with on projects,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=107.56) [I like to put underneath here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=109.99) [You can see I expanded our apache‑tomcat‑9.0.30 version here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=111.33) [And we'll want to remember where this path is because we](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=117.89) [have to configure this inside of IntelliJ.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=121.04) [We have to tell it the home path to this Apache Tomcat instance.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=123.31) [So remember where that path is.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=128.49) [Let's open up our IDE and get that all configured.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=130.51) [To begin with, we want to stop that server if yours is still running.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=133.69) [So our self‑contained server, I'm going to go ahead and click Stop on it.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=137.87) [Then I want to open up our settings and preferences,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=142.44) [so I want to go to File and Preferences.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=146.1) [I'm on a Mac, so mine's underneath the IntelliJ application name.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=153.8) [Yours may be under Windows Preferences if you're on a Windows machine.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=158.4) [I want to go to Build, Execution, Deployment,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=161.79) [Application Servers,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=164.84) [and you'll notice that we don't have anything configured here yet.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=166.54) [So I'm going to click the plus sign and say that I](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=169.88) [want to choose a Tomcat server,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=172.93) [and this is where it's asking for that home](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=175.53) [directory like we spoke about earlier.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=178.86) [So I want to navigate to that folder structure,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=181.41) [which mine was under DevTools, and I had Apache Tomcat 9.0,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=186.09) [and click Open.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=193.01) [So you see where I had mine into that Tools directory,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=196.21) [apache‑tomcat‑9.0.30, and it also put that as the base directory,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=200.34) [which is correct.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=205.16) [That's what we wanted that to have.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=205.94) [Those two should mirror each other.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=207.23) [There are cases where they don't, not in this course though.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=209.59) [For what we're doing, this is how we want it to look.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=213.21) [I'm going to choose OK, and it has all of that environment set up,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=215.61) [and select OK again.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=220.9) [Now, we need to change our project to be packaged as a WAR.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=223.83) [So if we open up our pom.xml file, right now,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=228.53) [there isn't a package type associated in here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=233.21) [So there's a lot of stuff going on in this Maven POM filer.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=236.58) [There's the parent, there's the group, and artifact,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=239.05) [and version ID, and our name of our project,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=241.98) [our Java version, and then dependencies that were added inside of here,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=245.47) [but we don't see any packaging type inheritance,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=248.9) [and it's because it's defaulting to what the parents says that we are.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=250.78) [We want to go underneath version here,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=254.04) [and you see it on line 13 in my application,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=256.14) [and choose package, and the packaging type is a war now,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=259.54) [and we'll save this.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=266.32) [And you can see that Maven,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=269.14) [I've purposely left it turned off on mine to show you,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=271.02) [is asking if we want to import these changes,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=274.27) [and I want to choose Yes, and you can enable it to auto import it as well.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=276.19) [I want to have it import these changes,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=280.91) [and now it's changed the project type of the structure of what we had.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=283.52) [Before, it was packaged up as a self‑executable JAR,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=287.34) [and now it's a WAR, so it should be available to our Tomcat server to deploy.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=291.74) [We need to make one other change to our POM file.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=295.91) [I'm going to scroll down,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=299.25) [and I've already copied and pasted in the code because I didn't want](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=300.28) [to have to have you watch me just type it all in.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=303.96) [I'm going to add a dependency, and I've just commented mine out here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=308.24) [I'm going to uncomment it.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=311.15) [Below the org.springframework.boot, artifactId of spring‑boot‑starter‑web,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=313.21) [and above the spring‑boot‑starter‑test, you see on line 29 through 33,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=321.02) [I've got this spring‑boot‑starter‑tomcat plugin in here,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=327.65) [and this is to remove the dependencies on the internal packaged](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=333.24) [application and convert this over to where we now have our own](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=338) [standalone Tomcat‑enabled WAR,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=342.22) [and so we have a WAR that will work for Tomcat with all](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=345.94) [of its dependencies all packaged up.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=349.12) [Let's save this, and now we can go edit our runtime configuration.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=351.48) [Click on Add Configurations up in your toolbar up here,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=356.97) [and you'll see we currently don't have a configuration for Tomcat.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=360.53) [We added the server, but we haven't created a configuration,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=365.75) [so let's click the plus sign, scroll down,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=368.36) [and select Tomcat Server and local.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=370.98) [If you don't see this,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=373.98) [you probably skipped the step earlier where we added](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=375.46) [that server in when we downloaded it.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=378.85) [So let's choose Local and open this up.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=381.24) [To start with, I want to select the correct JRE.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=384.69) [So make sure if you have multiple JREs installed, you choose the right one.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=388.79) [This is the one that I want.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=393.12) [For deployments, choose the Deployments tab and click the plus sign,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=395.14) [choose artifact, and choose the conference:war.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=401.66) [Click OK.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=406.94) [I want to change the Application context to just /conference,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=408.27) [and let's switch back over to our server,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=414.64) [make sure everything looks good here, and it is.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=418.28) [The URL is localhost:8080/conference,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=421.11) [though it should be the same from our deployment in our server,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=423.84) [and click OK.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=428.16) [There's one other small change we need to make.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=431.24) [I'm going to exit full screen mode here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=433.6) [Static resources aren't served from src,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=437.29) [main, resources, static in standard web applications.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=440.95) [They're usually out of a src, main, web app directory.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=444.85) [So if I right‑click and say New, Directory,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=447.54) [and choose webapp, now, notice, I started that off of src,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=452.24) [main, so src, main, and enter in the new directory web app,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=455.72) [and hit Enter, I now have a directory to start](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=459.24) [hosting up static resources out of.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=462.51) [And to begin with,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=464.79) [I'm just going to copy and paste that index.html that we had under resources,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=465.64) [static and paste that into of the webapp directory.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=470.46) [Click OK.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=476.11) [Now we have everything ready and configured to run our application.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=477.49) [If your configuration says Tomcat 9.0.30,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=482.54) [like mine does or whatever version you downloaded,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=486.99) [go ahead and click the plus sign next to it,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=490.14) [and it should start up your server for you.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=492.45) [And you'll see the build status in the lower‑right‑hand corner,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=494.56) [and then your server pop up.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=497.49) [And once its loads,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=499.12) [it's automatically configured to bring up your](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=500.37) [application and launch that Index page.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=502.4) [So it did it faster than I could even walk you through it,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=505.07) [and you'll notice our application pulled up,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=507.66) [and it's now localhost:8080/conference.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=509.88) [Before, we were just at root.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=513.04) [Tomcat, by default, does it by the name of your WAR file.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=515.24) [So our application is now localhost:8080/conference.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=518.65) [There's ways to change that.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=522.91) [You can go put the final build artifact name in there, but this is great.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=524.8) [This gets us developing and gets us doing everything we want to do,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=528.82) [and our app is now up.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=532.14) [We did a bunch of stuff there.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=533.94) [Let's walk through that real quick.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=535.9) [We started off by opening up our POM file and changing the](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=539.14) [packaging type to war and then adding this dependency for](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=545.31) [the spring‑boots‑starter‑tomcat.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=550.08) [We also downloaded a Tomcat instance and added a](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=552.94) [configuration for it. We see our configurations here.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=557.12) [I changed the URL to be /conference, and in the deployment,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=560.82) [I changed the Application context to be conference.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=566.12) [We need to make sure those two line up.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=569.59) [Back on our Server tab,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=571.94) [if you hate that it launches a browser every time it starts up,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=573.12) [you can uncheck this Open browser After launch checkbox right here in](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=576.77) [the center of the application configuration section,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=582.04) [and that can become a little bit annoying after a while.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=585.17) [I like it because it gets me up and running and](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=588.27) [lets me see what I want to faster.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=590.59) [But if you do hate that, you can go ahead and disable that there.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=592.44) [Then we went ahead and created a src, main,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=596.54) [webapp directory,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=601.6) [and copied over that index.html you can see on the left‑hand pane there,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=602.82) [and launched our application, which pulled up our index.html page.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=608.36) [So quite a few steps, Tomcat downloaded and expanded,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=612.59) [installed, configured the runtime configuration,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=616.13) [and then switched it over to a WAR and added a plugin for it,](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=618.71) [not that bad when you break down the steps. It just maybe seems like a lot if you're not used to all of that.](https://app.pluralsight.com/course-player?clipId=cc7d8695-8340-4d19-8438-02d2a4531db0&startTime=622.84)

### [Spring MVC Configuration](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737)

[A major change that was just beginning in the previous release of this](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=1.04) [course was the migration from XML in your web application.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=4.67) [It started first by just not having XML in your Spring code,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=8.54) [and then other standards pushed for it as well.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=12.28) [More recent serverless specification have called](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=15.46) [for not having a web.xml at all.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=18.63) [XML is often thought to be more complicated and,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=21.91) [at a minimum, is more error‑prone for copy/paste errors.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=25.22) [Not using XML though can fill a little like a blackbox.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=28.59) [And what I mean by that is you can start using it,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=32.45) [but not understand what's going on behind the scenes.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=35.05) [This often leaves developers confused about what's going on in](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=38.1) [their application and how it's working and,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=41.38) [furthermore, left wondering what to do when something breaks.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=43.81) [The configuration of Spring MVC though,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=47.38) [regardless of whether we're using XML or not,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=51.02) [is broken down into four basic areas.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=53.83) [First, we have a POM file to download any of our dependencies,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=56.84) [and that's what we created using the start.spring.io starter initializer.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=60.48) [We then have a configuration section,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=66.94) [whether that is XML or Java configuration or using web.XML.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=69.92) [There's going to be a configuration section next, so don't worry about that.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=75.34) [The next section is our Java files, our controller,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=79.14) [possibly our configuration, our model tier.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=83.78) [That's all going to be done in Java code.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=86.57) [And the last section is our view.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=89.05) [It doesn't matter if we are doing REST services,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=91.64) [Java Server Pages, FreeMarker templates,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=95.19) [we're actually going to look at Thymeleaf in this course. As a side note, you](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=98.27) [can use all of these in your application at the same time,](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=102.36) [but we're going to focus on them one at a time and see how](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=105.56) [this helps us navigate through our app. Let's look and see how this was configured in our application now.](https://app.pluralsight.com/course-player?clipId=994d4aba-bd7a-4964-9c32-c2f468307737&startTime=108.41)

### [Demo: Greeting Controller](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac)

[As I mentioned earlier,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=1.04) [we had our four basic categories inside of our application.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=2.07) [We've done a bunch with our POM file already to begin with,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=5.81) [and we really don't need to add any more dependencies in there right now,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=8.9) [so we've got one of the four out of the way.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=11.71) [The next one we'll go to is the view,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=14.01) [and our views are usually served up from underneath our src main](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=16.43) [webapp directory in a traditional JSP application.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=20.27) [So I'm going to right‑click on our webapp directory and say,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=23.5) [New, Directory, WEB‑INF, hit Enter.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=27.16) [And underneath that, I want to create another directory and call this jsp,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=35.14) [Enter, and I want to create a new file underneath here and call it greeting.jsp.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=41.31) [And there are some wizards and stuff you can use to create this.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=49.54) [This is a simple page.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=53.93) [I'm actually going to open up our index.html page,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=54.97) [grab the body of this all out of here, and paste this into my greeting.jsp page.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=58.93) [I'm going to change the index to greeting,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=66.53) [and we're going to do something a little different now.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=69.69) [I'll close that index.html just to make sure that we don't make a mistake there.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=71.82) [I'm going to go to the h1 tag that we have up there](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=76.24) [and change that to ${message}, and save that.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=80.53) [We're going to pull this out of a request that we're](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=86.87) [going to make to a controller.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=90.36) [So now we have our view taken care of.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=91.87) [We've created a JSP page that's going to go pull these attributes back out.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=94.77) [Let's go ahead and change the configuration of our application.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=100.54) [It's now a Spring Boot application.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=105.66) [Let's make it so it launches our DispatcherServlet how we're](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=108.02) [normally used to in a Spring MVC application.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=110.59) [If I go to my ConferenceApplication class,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=114.21) [notice on line 8, it is our configuration class.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=118) [We're going to continue to take advantage of that, but we're going to](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=120.78) [make this extends SpringBootServletInitializer. And what this will do](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=123.95) [is launch our application with the desired configurations we're used](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=134.61) [to using inside of a web app.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=138.69) [So it's going to set up an internal view resource resolver. We're](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=140.41) [going to talk about all of that stuff later.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=143.54) [It's going to resolve JSP pages, set up JSTL for us,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=146.06) [basically launch stuff the way we want to.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=150.19) [We'll break all of these pieces down.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=151.99) [We've just got to get something out there for you to](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=153.78) [use so that we can talk about it.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=155.75) [So let's save this.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=158.2) [There's nothing else to do here, and then open up our](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=159.66) [application.properties file, and that's underneath src main resources. If](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=163.86) [you're using the ultimate version of IntelliJ or Spring STS,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=168.67) [you actually get some context‑sensitive help inside of here. So](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=173.66) [I'm going to type spring.mvc.view.prefix.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=176.76) [And we want to put in that directory we just created,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=182.23) [WEB‑INF/jsp/, and don't forget that trailing slash. And then we](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=184.77) [want to do spring.mvc.view.suffix, and we want to have .jsp, and](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=192.41) [also don't forget the .jsp on that.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=201.4) [So save this. Now this is the other part of our configuration](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=204.88) [that tells it where to one, look for JSP pages, and two, what](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=210.14) [the extension for those are.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=214.66) [If we were using other templated tools or when we](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=216.96) [get into the Thymeleaf section, this will be a different configuration.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=219.47) [So now that this is all set up,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=223.83) [we can move to the Java portion of our application or where we](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=225.42) [start doing things inside of our Java code.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=228.51) [Let's go up to our src main java directory and click on](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=231.84) [our com.pluralsight.conference package,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=235.47) [right‑click and say New, Java Class. And the way IntelliJ works, we want to type](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=239.24) [in controller., so it's going to add a new package for us.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=246.98) [I'm going to call this the GreetingController, and hit](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=253.25) [Enter. It will pull this class up for us.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=258.71) [Now we're going to go through all of these pieces and explain what all of this](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=262.12) [does, but for now, we want to type @Controller and have it select that and](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=265.62) [import that class for us, and we can put a method signature down here that does](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=273.57) [what we want to do inside of our applications.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=278.81) [We're going to start off by saying @GetMapping.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=280.65) [And when we request the URL of greeting,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=284.44) [we want it to go through and call this method.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=289.24) [So we'll say public String greeting.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=293.23) [This method name could be anything.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=298.29) [I just chose greeting to keep it consistent, but it could be foo, it could](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=300.52) [be bar, it could be greeting, it could be say hello.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=304.89) [It doesn't matter what the method name is. The GetMapping on](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=307.83) [line 9 matters. The method name does not.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=311.51) [So, now we could pass in some parameters here, and we want to pass in a](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=314.64) [map, and that map we want to be a String Object pair,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=319.16) [and we're going to give it the parameter name of model. Now inside](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=330.5) [of here, this is how we can pass attributes back through our model.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=335.38) [So we'll say model.put. And for our key, because it's just a simple](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=339.71) [map, we'll say message.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=347.62) [Remember,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=350.13) [that was the variable name we had in our JSP page. And for the object, we're](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=350.46) [going to put a string, and I'm going to put in Hello Bryan.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=357.21) [Feel free to replace that with your own name.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=360.64) [And from here, we're going to return the string greeting.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=365.05) [Now, what this does is when we ask for the URL/greeting.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=373.04) [It's going to call this method, put this message into the model,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=379.55) [and then that return line on line 14's going to go out](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=385.77) [and look for a JSP page named greeting.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=389.35) [Those are the two variables we put in our application.properties.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=391.91) [If this finds everything and executes correctly, it will then return](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=395.48) [that JSP page with these values rendered for us, so those four files](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=399.43) [we just worked with. Let's save this. I'll make this full screen so](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=404.49) [you can see everything.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=409.28) [It actually fit in that one window.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=410.12) [But this is everything that we needed to create our](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=411.97) [controller and return that value for us.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=414.78) [Now that we have this in place, let's go ahead and start up our server.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=418.44) [When this launches, it will take us to our index page that we have created.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=425.74) [And then we can type in our greeting URL.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=430.14) [So now we can go here and type in greeting and hit Enter. It'll say Hello Bryan.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=434.32) [So we got all those pieces in place. To reiterate our packaging](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=443.54) [and the way we talked about our four areas,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=449.3) [we had our Java code, which contained our controllers, our greeting controller,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=451.67) [some configuration in our properties, our actual webapp configuration,](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=456.8) [which we're going to expand on all of this as we build out](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=461.4) [the course, and our JSP pages that contained our view. Pretty](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=464.01) [easy when we broke it all down.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=468.61) [Now that we've gone through all of that configuration work, it](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=470.19) [literally just allows us to put in little pieces of our application and build it out as we go.](https://app.pluralsight.com/course-player?clipId=b1626aa9-bb7c-4986-8415-7791e60f53ac&startTime=473.14)

### [Summary](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02)

[This was a bigger module.](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=0.97) [We went through all of the prerequisites that we](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=2.88) [needed to build your application.](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=5.36) [We got Spring and configured it in our application.](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=7.74) [We went through all of those configuration pieces in both Spring Boot, and](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=11.94) [talked about WARs versus contained JARs with Spring Boot, and showed you how](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=17.61) [to do the Spring MVC configuration as a standalone,](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=23.56) [as well as configuring Tomcat and showing how to set up the build and run](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=26.83) [configurations in your environment. So a lot of stuff covered. All of these](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=32.11) [concepts, if you don't really understand them yet,](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=36.78) [that's not a problem.](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=40.06) [We're going to go through and build upon all of those as we go](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=41.16) [throughout this course. In fact, the next section we're going to](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=44.66) [dive deeper into JSPs and adding more functionality into your application to help solidify these points.](https://app.pluralsight.com/course-player?clipId=329ba3f5-4406-44db-9d40-ca266b137f02&startTime=47.77)

## [Understanding the Structure of Spring MVC Applications](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17)

### [Introduction](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17)

[Understanding the architecture of Spring MVC will actually help you write](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=1.04) [applications faster and troubleshoot problems more effectively.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=5.27) [We're not going to deep dive into an architecture discussion,](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=8.95) [but let's cover a basic understanding so you know how](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=12.04) [to use Spring MVC more effectively.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=14.91) [This is a short module that leads us through the](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=17.49) [structure of the rest of the modules.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=20.07) [Software architecture has been around long before since Spring and Java.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=23.38) [Architecture and design patterns are important,](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=29.34) [though,](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=31.33) [because it gives us a common vocabulary that we can talk](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=31.48) [about the features of a framework.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=34.34) [And if you have some background and software development,](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=36.24) [you can know what a framework or an application is doing without knowing](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=39.68) [exactly how it's doing it just by the terminology that we use.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=43.11) [We can discuss parts of an application based around the](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=48.04) [architecture or design patterns that it's using,](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=50.74) [and everybody can be on the same page without even having developed on that application before.](https://app.pluralsight.com/course-player?clipId=001cf5e6-81e5-4b06-8d2a-68c79c62fa17&startTime=53.42)

### [Model-View-Controller](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a)

[Here is a standard MVC or model view controller design pattern](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=1.04) [that you may or may not have seen before.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=5.96) [It's a pretty common pattern.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=8.03) [In fact,](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=9.6) [I would say that most developers have at least seen it or at least heard of it.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=10.14) [A request comes through the view based off of some user](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=14.53) [event and then is interpreted by the controller. The](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=18.37) [controller can change the model or not.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=21.27) [And then it will select the view based off of our action.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=23.74) [From here,](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=27.11) [the model can update the view with the database off of the user's actions.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=27.65) [This graphic is sometimes confusing though because it's stemmed](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=32.14) [from rich client applications that were more event based or using](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=36.2) [a design pattern called observer observable or a subscriber](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=40.49) [listener type design pattern.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=44.79) [Not really applicable to a lot of the software development we do with the web.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=46.72) [This pattern in concept is still very sound, but we](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=51.84) [usually don't have our model updating our view because](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=55.72) [it's gone to a page at that point, and it's disconnected from our back end.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=58.87) [This graphic though is a more accurate description of the kind of life](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=63.98) [cycle that we may be faced with in web development.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=68.4) [The graphic is realistically more like the life cycle](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=71.94) [that we see in our web application.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=74.85) [Our view can access our model, but it's usually done so through a controller.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=77.04) [We'll look more at lightweight approaches in the Ajax module later](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=82.74) [in this course. The summary is we usually make a request, even if](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=86.33) [it's a lightweight request, through our controller to access our](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=90.56) [model. We don't have our view typically going directly against our database or model.](https://app.pluralsight.com/course-player?clipId=d1beb003-2e85-48c3-a2db-d60f7fc3bf6a&startTime=94.26)

### [Application Layers](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b)

[You'll often hear people talk about applications in](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=0.84) [terms of a tiered architecture, or an n‑tier architecture,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=3.76) [or layers.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=7.61) [We try to build our applications in tiers more now in enterprise languages,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=9.04) [and there are great reasons to do so.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=13.37) [A few of these are separation of concerns.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=15.74) [This just means that each layer is only concerned](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=18.68) [with the task that it's assigned to.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=21.24) [So our presentation layer is only going to have presentation type things in it,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=23.93) [and our business logic is going to be contained in a layer,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=28.84) [and data access is going to also be contained in its own separate layer.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=32.37) [Now there's another term called reusable layers,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=36.93) [and that sounds very similar to separation of concerns,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=39.47) [and in some ways it is, but its focus is different.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=42.7) [If I have business logic in my presentation tier,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=47.09) [I can't easily change my presentation tier or expose a web service,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=50.84) [for example, without recreating some of that logic.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=55.42) [If I have extracted it into its appropriate tier,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=59.48) [then I'm not duplicating that logic.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=62.64) [So if you ever notice yourself copying and pasting code in your application,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=65.45) [it's probably not in the correct tier or it's not](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=70.57) [architected in the correct tier or way.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=74.22) [Now, that's a little bit of a difference between the](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=77.73) [separation of concerns and the reusable layer.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=79.95) [Separation of concerns is not about reuse.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=83.01) [It's just about having things in the right layer,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=86.75) [so I can re‑architect them later.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=89.37) [Where reusable layers means that I have a purpose and](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=91.64) [a point that I'm trying to drive.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=94.92) [I can expose the same data in multiple ways without having to worry about it,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=97.41) [or I can replace my presentation tier without having](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=102.52) [to re‑architect my application.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=105.47) [Another term is maintenance, or refactoring,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=108.34) [that might be a better way to put it.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=111.56) [The ability to change things without having those](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=114.41) [things ripple through all of our code.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=117.33) [So if I have Hibernate in my application,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=120.04) [and I have to change something in my UI based off the](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=122.3) [change I made in Hibernate, no, I'm not talking about a business need,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=125.1) [but more of a I want to change how a table is structured or something like](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=129.65) [that, I'm not separating those into the right tiers correctly.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=133.31) [If this is done correctly,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=138.1) [we can change our code and not have to retest everything,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=139.35) [but rather just the pieces that we changed.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=142.94) [This leads into a much larger discussion about unit testing,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=145.93) [but that's outside the focus of this course.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=149.4) [Talking about those layers of our Spring MVC application, and this is](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=152.1) [important because of how we annotate our components,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=156.29) [which we're going to talk about here in just a second, we first have a data](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=158.74) [model that we would be accessing using something like Hibernate,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=162.99) [or JPA, Spring JDBC.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=166.8) [This layer represents the data or model of our application.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=169.43) [Next we have a controller that interprets the user's requests and](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=173.74) [selects the appropriate view based off of what we've requested or what](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=177.15) [information we got back from our data model.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=181.67) [And then we have our view.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=184.74) [For our class, we're going to be using the JSPs,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=186.52) [and we'll also look at Thymeleaf, as well as exposing](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=191.09) [some things through web services.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=195.5) [Now, one thing that's often misunderstood by people is that Spring](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=197.45) [MVC has nothing to do with regards to our database,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=201.7) [but it has a model associated with it.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=205.24) [So is the model talking about our database or the model talking about what](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=208.12) [our framework is going to represent to just our JSP page?](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=212.18) [It's actually the latter.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=216.34) [It's referring to what we're going to represent in our JSP page,](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=217.65) [or our Thymeleaf page, or our web service.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=221.34) [We always have to get that information from somewhere.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=224.25) [So that's where our various components come in and what we're going to talk about next.](https://app.pluralsight.com/course-player?clipId=d637113b-1b89-44cb-ad14-8adf92a15e8b&startTime=226.96)

### [Spring Components](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e)

[We've spoken about tiers, and we've spoken about layers,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=0.84) [and we've started to allude to components inside of our application.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=3.96) [So how do we represent these tiers with Spring and Spring MVC?](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=7.64) [That's with these three components.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=12.82) [We have our controller, our service, and our repository.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=14.91) [We've discussed controllers already a little bit.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=20.74) [They just route where we're going to and interpret the user's request.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=23.56) [The service is where our business logic goes.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=28.2) [It should also be noted that it's where our transactions will most](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=31.25) [likely start as well, if we're accessing more than one database](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=34.06) [table. And then there is repositories.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=37.54) [The repository tier is also sometimes referred to as the DAO,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=40.53) [or data access object, and they usually have a one‑to‑one](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=45.43) [mapping with our database table.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=48.73) [So looking at controllers, as we've mentioned,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=51.14) [they handle our incoming requests in building the response. I can't emphasize](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=54.19) [strong enough that business logic should not be handled here.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=59.62) [This is also where our request and our response object should stop as](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=64.23) [well. We shouldn't hand those off to separate tiers.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=68.38) [It should grab information from the request and the response and hand that](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=73.44) [over to the business logic. This works with our service and repository tier](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=77.07) [for the business logic and data gathering,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=82.3) [and it's annotated using the @Controller annotation.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=84.84) [There are some convenience classes that you extend,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=89.48) [but you either have to wire them up or annotate them with the controller still.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=92.53) [It also should be noted that this is where we handle](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=97.28) [exceptions and route views accordingly,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=100.22) [based off of whether or not you had an exception or if](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=102.73) [we've got the correct information.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=106.62) [The service tier is annotated with the @Service annotation,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=109.04) [and it describes the verbs, or actions, of our system.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=112.9) [It's where our business logic should reside.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=116.64) [In fact, it should all be contained here.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=120.26) [It shouldn't bleed over into our repository tier. Another](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=122.33) [role of the service tier is to ensure that the business](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=126.19) [object is in a valid state.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=128.98) [This is where all of our state management should be handled,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=131.04) [confirming that we've got a valid object passed in from a](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=133.77) [request. It meets the standards of our business objects or](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=136.7) [our business requirements.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=140.97) [Also, this is where our transactions should begin.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=143.14) [If you're doing two‑phase commits or there's a chance we might have to](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=146.04) [roll back or access web services, those types of things, this is where](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=149.12) [we want those transactions to begin.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=153.31) [It often has the same methods as a repository, but a different focus.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=156.32) [We may have a method in here that says, find user by last name,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=162.6) [and we may have that same method in our repository, but what we do if we don't](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=167.68) [find the user or how many people will return or what state we might return](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=171.83) [those objects in is controlled by the service tier,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=176.54) [where the repository tier is just going to go get that data.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=179.74) [And lastly,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=184.08) [the repository tier. The repository tier is annotated with @Repository, and it](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=184.79) [also describes the nouns of our systems. Where the service here described the](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=191.05) [verbs, the repository tier is focused on the nouns.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=196.6) [You can see where the focus is different from the service versus the repository.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=200.24) [The service tier describes those actions that we want to do,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=204.94) [and the repository describes the data that we're going to interact with.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=208.58) [It's focused on persisting and interacting with the](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=213.51) [database or basic CRUD functions.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=216.64) [It's also typically a one‑to‑one mapping with an object.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=219.14) [You may have an address and have an address repository.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=223.41) [You would have a customer object and a customer repository.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=226.8) [It's also often a one‑to‑one mapping with the database table,](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=230.45) [but that's not always the case based off your design.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=233.98) [You make break things into multiple tables like a person and](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=237.09) [an employee table, but you may only have an employee object](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=240.7) [inside of your application. That's really more up to the ORM tool that you're using.](https://app.pluralsight.com/course-player?clipId=f77c2e5c-ab76-4eef-af78-b8275c58cd8e&startTime=244.17)

### [Summary](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76)

[Just to quickly recap what we covered in this module, we talked about software](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=0.94) [architecture and how it's a much needed thing in our industry to convey](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=5.38) [information and vocabulary about what we're trying to do.](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=8.77) [We talked about the model‑view‑controller design pattern and how the](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=12.4) [traditional model‑view‑controller design pattern isn't necessarily very](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=16.14) [reflective of what we're doing inside of a web application.](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=19.93) [We also talked about N‑tier applications and layers and](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=23.44) [applications and why it's beneficial for us, and that leads us into](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=26.74) [a deeper discussion about the various components of our app and how](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=30.71) [we interact with those components,](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=34.24) [specifically using our controller, service, and repository objects.](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=35.5) [Those three pieces are what really builds up our access to our back](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=41.01) [end and where our business logic should reside.](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=45.65) [And even though there are more Spring proper than Spring MVC,](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=49.04) [we should always use those within Spring MVC to help our model‑view‑controller design pattern, which Spring MVC participates in.](https://app.pluralsight.com/course-player?clipId=d64773d7-aa99-4043-872e-206302e05b76&startTime=53.82)

## [Creating Controllers in Spring MVC](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296)

### [Introduction](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296)

[We've already created one basic controller,](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=1.03) [but let's dive into some more of the complex functionality of controllers.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=3.68) [Controllers are really the heart and soul of Spring MVC.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=8.21) [They're the gateway or proxy into everything else that](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=11.48) [happens in our Spring MVC application.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=15.07) [It's really crucial to have a great understanding](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=17.76) [of exactly what controllers are,](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=20.12) [what they're not, and how we can use them in order to](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=22.11) [build a successful Spring MVC application.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=25.2) [So what is a controller?](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=29.2) [Spring MVC is very similar to other MVC frameworks in the](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=31.34) [sense that there is a separation of duties.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=35.36) [This is different from older approaches where we may have just](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=38.15) [had logic and JSP pages and passed information from one page to](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=41.19) [another page or a framework of just servlets and building the UI](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=45.42) [out of string buffers,](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=49.22) [writing content at the output stream. In Spring MVC, the controller](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=50.31) [is the central concept or part of the framework.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=54.82) [This may not make much sense to you with how you've written applications](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=58.41) [historically because we used to not think of controllers in the sense of verbs](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=62) [or actions. With the rise of RESTful applications,](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=66.42) [though, and RESTful services,](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=70.24) [it makes more sense to begin to think of controllers in the sense](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=72.14) [of verbs or what I can do within an application.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=75.45) [You really need to think of controllers as choosing what to do based off](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=79.14) [of a user's actions or requests, and then the view or the actual web](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=82.86) [page is just a result of doing some action. Let's look a little more at the architecture of what makes up a controller.](https://app.pluralsight.com/course-player?clipId=10435043-2d16-4536-b1f7-68f7edd29296&startTime=87.92)

### [What Is a Controller?](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c)

[We've already seen some of this before, and, in fact, this image](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=1) [was the same image we used in our architecture discussion in the](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=4.91) [previous module, but I grayed out the other tiers to just focus](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=8.58) [on what is a controller.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=12.25) [And we've even created a controller when we wrote our greeting](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=14.44) [controller in our first step of our application.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=17.99) [But here's what's happening as we're going through a](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=21.43) [request from the user. The request comes in,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=23.88) [and that's going to go to a particular controller based off of what](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=27.14) [the user's request was, and it's going to interact with some business](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=30.73) [logic. Now that business logic is going to produce some data, and it](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=34.41) [can theoretically be a web service or it could be our database or it](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=38.64) [could just be our business logic tier. That's going to produce some](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=42.47) [output.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=45.93) [We can think of that as our model or our UI, and we'll eventually](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=46.78) [return that model back to our UI on our response.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=51.63) [As we come out of our web service or request,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=56.04) [we're going to hand that back to our controller, and then our controller is](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=59.49) [going to go in and decide which view is appropriate based off of what](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=63.5) [information was returned or what happened out of our request,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=66.95) [and we're going to hand that back to the user.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=70.68) [The controller can almost be thought of as a traffic cop,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=74.3) [hence the logo defining a traffic light.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=77.67) [The responsibilities of a controller are to interpret user](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=80.77) [input and transport that input into a model.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=84.1) [To take that information that's going to come back from our business](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=87.98) [logic from our service tier and build that into a model to hand back to](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=91.05) [our UI. It is the gateway to our business logic, and will determine the](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=95.93) [correct views based off of that logic.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=100.62) [One other key point that never really seems to come up to play as far](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=103.64) [as the duties of a controller is, is that it also interprets exceptions](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=107.47) [for the business logic and service tier, and how to handle and navigate](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=111.61) [those correctly from there.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=115.78) [Now,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=117.5) [it could be a business logic exception in the sense that you](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=117.74) [haven't given me a valid date, or it could be, hey,](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=120.38) [the database is down.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=123.72) [I'm going to send you this error page rather than requesting that you add](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=124.8) [this information or correct this information on the screen.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=128.35) [So its duties are to also interpret those errors, and handle and navigate from our middle tier.](https://app.pluralsight.com/course-player?clipId=c2d47b68-489f-436c-bde3-99ba3a8a940c&startTime=132.34)

### [@Controller](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30)

[Controllers in Spring MVC are very lightweight.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=1.04) [They don't even actually require you to implement an interface.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=4.57) [So if you remember, our controller definition from our](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=8.44) [Hello World action that we did earlier,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=10.87) [our greeting controller was very basic, no interface,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=13.34) [no class that we had to extend, we really only needed two parts.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=16.83) [We needed a Controller annotation that told Spring MVC that this is a](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=20.87) [controller and it should be included in the available controllers for it to](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=25.28) [route information to, and that we needed to have a request mapping](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=29.6) [associated with it. And the request mapping,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=33.9) [which in our case,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=36.93) [is a GetMapping, tells Spring which method is going to](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=37.9) [handle which request. Now before we move on,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=41.72) [though, I want to mention a few things.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=45.16) [Spring does have some older concrete classes that you can extend,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=47.21) [and your URL will map the class based off the controller name.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=51.71) [It's a little bit of an older approach, in fact,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=55.47) [it's kind of a more odd approach now, but it works just fine,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=57.83) [and you may run into it out there.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=61.49) [More and more people, though,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=63.84) [are choosing the controller request‑based mapping approach as they've worked](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=64.88) [with more and more RESTful services. It doesn't make a lot of sense to have](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=69.15) [two different ways inside your application. Since I'm going to show you some](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=73.56) [of the things with RESTful services later,](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=78.21) [I chose to just show you this approach in this example. There are other ways of doing it, though, like I mentioned.](https://app.pluralsight.com/course-player?clipId=ffd62eb0-004f-4322-9dae-454958cb3c30&startTime=80.38)

### [Demo: Registration Controller](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3)

[Let's start adding some of our conference registration](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=1.04) [functionality to our application.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=3.98) [We've gone through and looked at controllers, looked at all the pieces.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=5.96) [Let's just start adding some functionality to our app.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=9.31) [I have closed all the open files that I had and shut down my server.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=12.81) [I would advise you to do the same thing so that we're in the same space](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=16.64) [and same state if you don't have any problems with that.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=20.12) [I'm going to start by first opening up our webapp folder,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=23.01) [and we created this index.html file underneath webapp.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=26.18) [We don't need that anymore because we have our application configured correctly](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=30.31) [and hosting up Spring MVC files so it will utilize that src,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=34.89) [main, resources one that we kept a copy of.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=40.17) [I'm going to go ahead and delete this and click OK.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=43.35) [And then what I want to do is I'm going to open up our jsp folder,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=48.24) [and I'm going to right‑click and create a new JSP file.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=51.97) [And I'm going to call this registration.jsp.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=56.64) [And it will create the standard template that we've already been using.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=61.19) [I'm going to change the title to say Registration.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=67.83) [And for now,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=72.05) [I'm going to do the same thing we did before and add in an h1 just to](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=72.96) [make it so we don't have a blank page when we land here.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=78.06) [And I'll just say Registration here as well.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=80.64) [Now I want to go to that static HTML page we have for our index underneath src,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=84.18) [main, resources, index.html.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=92.04) [I'm going to open that page up.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=95.28) [I told you when I set up our environment that I like it to go](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=96.59) [ahead and keep pulling that index page up.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=101.56) [And there's a little trick as you're getting started with Spring](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=104.87) [development and IntelliJ and all these tools that I like to do.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=108.53) [I like to leave this basic index.html page or a development page in here.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=111.85) [You can keep one of these in your application,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=116.44) [and it doesn't need to be named index.html.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=118.09) [You can point your run configuration to a different page.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=120.27) [But I want to go in here, and I'm going to add href.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=123.56) [And I want to point this to greeting, and I want to close that off,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=129.04) [and I'm just going to say Greeting here.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=137.44) [Make sure you don't take the default of the /greeting because that](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=140.64) [will take you to the root of the application,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=143.71) [and it won't function correctly.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=145.63) [So I'm going to save that.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=147.51) [I'm going to add another one here and do the same thing.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=148.79) [I'm going to say a href.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=151.12) [I'm going to do registration,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=153.25) [and I want to close that element off and save that as well.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=158.63) [Now I've got these two anchor tags in here,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=166.93) [and what happens is that it launches our application.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=169.44) [I'm just going to be able to click on these links really easily to](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=171.44) [navigate to different pieces of our application.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=174.04) [Let's launch our app now and see what it does.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=177.69) [I'm going to go down to our Run console and click the](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=181.36) [start for the run configuration,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=184.93) [or you can do it from up above in our Tomcat configuration.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=186.24) [And when this gets done building,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=189.48) [it's going to pull up our web page and navigate us to our index page.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=190.43) [Now you'll see we have a Greeting and a Registration link here.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=199.24) [When I click on the Greeting link, it'll navigate me to the greeting page.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=202.86) [It's exactly what we expected it to do.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=207.03) [If I back up and go to the Registration, it's going to get an error.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=208.98) [We don't have that mapping set up.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=212.74) [It's because we haven't created a controller to point to that.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=215.68) [Let's do that now.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=219.34) [Switching back over to our IDE, let's go ahead and open up our src,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=221.18) [main, java controller package.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=227.15) [And I want to right‑click on that and say New, Java Class.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=231.85) [I'm going to call this RegistrationController and hit Enter on that.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=235.73) [And we're going to go through the exact same operations we did before.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=244.02) [We're going to annotate this as a Controller.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=247.59) [We want to add an annotation for @GetMapping.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=250.25) [We want to tie this mapping to registration.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=254.74) [And then we want to add a method in here of public String getRegistration.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=260.17) [And I specifically named it that because we're doing](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=268.69) [a Get on the registration URL.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=271.6) [Honestly, it's just my naming convention.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=274.1) [There's nothing significant to it, nothing Spring related.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=276.94) [It's just my own personal preference.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=279.84) [And we're going to pass in the Map<String,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=282.59) [Object for our model to pass attributes back and forth.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=285.31) [And inside of here, we can now just return the string registration,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=291.02) [and that is going to do an internal lookup to our registration.jsp page.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=299.21) [Let's go ahead and restart our server, let that pull up again,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=305.83) [and check to make sure that all of those pieces are](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=308.92) [wired up how we think they should be.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=311.72) [Our app will now display the registration page when we've linked](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=313.94) [to it by clicking on that registration page,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=319.23) [and that's what we expect to see.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=323.18) [It's now serving up our page through our controller.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=324.74) [But hold on.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=329.45) [How is it doing all of this?](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=330.32) [That's great that we've added a controller in here and we've added some](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=333.37) [JSP pages and they've somehow wired themselves together.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=337.56) [What's really going on inside of here?](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=341.36) [If we open up our GreetingController that we created](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=344.14) [and our RegistrationController, they look the same.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=349.58) [There's nothing telling it where to route here or what we're doing,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=352.63) [any of that type of stuff.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=356.56) [And there's nothing inside of this JSP page that's](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=358.12) [telling us anything significant.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=361.01) [Well,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=363.14) [it all starts with our ConferenceApplication that is](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=363.9) [annotated as a @SpringBootApplication,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=368.21) [and it extends SpringBootServletInitializer.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=372.46) [This tells the application server to go ahead and create a](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=376.47) [dispatcher servlet and start serving up things.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=383.1) [And as part of that annotation of @SpringBootApplication,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=386.91) [it goes and starts looking for our controller and things with our](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=391.51) [annotation such as @Controller and @GetMapping,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=394.9) [and our GreetingController that has the same thing,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=398.77) [@Controller and @GetMapping.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=402.28) [It starts navigating through all of that stuff.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=403.94) [So this underneath the scenes here is creating a dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=407.07) [If you've gone through this course before or you're](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=411.91) [looking at older JSPs that have been written or maintained](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=414.07) [through a Spring MVC application,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=419.36) [it's always centered around a dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=421.55) [If we look at our run configuration and you go scroll through this,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=424.89) [you'll see inside of here it is calling our dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=429.54) [It tells us that it's initializing that dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=434.91) [Well, we didn't create that.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=437.75) [Spring did for us by extending that SpringBootServletInitializer.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=439.76) [It got rid of a lot of the boilerplate code that we have done](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=444.24) [in the past by just configuring that for us.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=448.24) [Now if we open up our project, how do we interact with that though?](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=451.89) [It's our application.properties.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=456.64) [This is where we did our InternalResourceViewResolver.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=458.03) [We told it to go look under this directory and look for .jsp pages.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=461.55) [So when we return that string from any of our controllers,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=466.88) [our RegistrationController, for example,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=470.56) [it is handling every web request through our dispatcher servlet.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=473.34) [That's why the GetMapping for registration ties to it the way that it does.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=476.95) [And when we tell it to return that registration page,](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=481.08) [it goes and looks for that registration.jsp page. Let's dissect this a little bit further in the next few examples.](https://app.pluralsight.com/course-player?clipId=96814d94-c420-4396-a67f-496758271ce3&startTime=483.95)

### [@ModelAttribute](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b)

[To be able to pass data from our request, whether that's a RESTful](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=1.04) [service or from a JSP page to our controller,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=4.63) [we're going to use some libraries provided to us by Spring MVC.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=7.61) [We could actually just use the standard HTML input tags,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=12.31) [but Spring provides us a library making it easier to](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=15.23) [interact with our controllers.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=18.42) [Historically,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=20.19) [we've always just passed HTTP parameters that have gone on an HTTP](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=20.94) [request, and those parameters can then be accessed much similar to](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=25.62) [like a hash map where I just grab a parameter based off of its name so](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=29.2) [every HTML element would be named.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=34.17) [Well,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=37.21) [there's tags that Spring provides us to take these values](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=37.58) [from our input page and make them available to our](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=40.72) [controller through the model hash map, bind them to a specified object,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=43.2) [which is actually the approach we're going to do, or just be able to grab](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=48.42) [them off the request. So we could always pass in the servlet request into](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=51.91) [our method name and access it that way.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=58.2) [I'll actually walk through the example showing you all of those.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=61.67) [The model can actually be a bit confusing, as you'll notice in our](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=65.91) [controller box that our model for accessing parameters and returning](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=69.11) [data is actually the same model and view object.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=75.92) [We'll walk through that, though, so it's not quite as confusing.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=80.14) [The binding object attribute approach that I just spoke about is used whenever](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=83.25) [we want to send data to our controller or retrieve data from our controller](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=88.48) [that's bound to an object or represented by an object.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=92.78) [The nice thing about Spring MVC is that it's all done with basic POJOs and](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=96.27) [not using a class that's only specific to our UI like in some of the other](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=100.79) [frameworks such as Struts or WebWork or Stripes.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=105.14) [So we'll use the @ModelAttribute when we want to do](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=109.48) [an HTTP Get to get back data.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=111.69) [So say I'm going to get a drop‑down like a list of states or,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=115.22) [you know, a drop‑down type list of data,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=118.9) [gender, or those types of things.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=122.41) [We want to grab that stuff that might be driven by our database.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=125.54) [Well, we also use that same thing for Post. So it's the same object.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=129.94) [It's bound the same way, and it's described the same way.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=134.5) [We have a form that we're filling out,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=138.24) [and that's actually the example we're going to do here in our demo in a](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=139.99) [couple of minutes is the object that we send down through our Get is](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=142.82) [the same object we'll bind to on our Post.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=147.22) [I mentioned it works with POJO, so it's very simple.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=150.46) [And I don't have something that's specifically bound to just my UI tier.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=154.77) [I can use it anywhere in my code.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=159.18) [These objects can also be validated with a binding result.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=161.65) [We're going to cover that in its own separate module later,](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=165.33) [but just to point it out so you're aware of it, you can have this data validated as part of your lifecycle.](https://app.pluralsight.com/course-player?clipId=51140a70-ba80-4061-b332-da0df2ba758b&startTime=168.29)

### [Demo: Passing Parameters](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f)

[This is where we left off our registration page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=0.98) [After just performing a GET to display the page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=3.99) [Let's now turn this into a form where we can use it to](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=7.7) [turn a POST back to our controller.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=9.94) [Going back to our IDE, I'm going open up that registration.jsp page,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=13.64) [and the first thing we need to do is add that spring](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=18.94) [tag library up at the top of it.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=21.2) [And the syntax for that's a little bit odd. So we've got to do a %@,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=22.96) [and it's going to ask us if we want to enter a tag library,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=27.03) [which we do.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=30.49) [And we need to give it a prefix.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=32.64) [The prefix want to give this is form.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=34.14) [And you can name this whatever you want.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=37.25) [We can do a URI and choose springframework.org/tags/form.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=38.76) [So now we've got our tag in here,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=46.51) [and that's going to help us auto complete stuff inside of our body.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=48.73) [I'm going to go below that h1 that we created and create a form](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=52.41) [using the form tag library that we just imported.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=56.56) [And inside of here, I'm going to do a couple of things,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=62.64) [and I'm not going to bore you with all the typing details.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=64.74) [I'm going to throw in a table, yes, just a basic HTML table,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=67.78) [and we'll do something fancy here with CSS and other stuff later.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=71.16) [But inside of here, we're going to do a tr,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=75.58) [and we're going to give this a td,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=79.44) [and this is where it starts to get a little bit fun.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=84.53) [I'm going to give this a name, and in the next td,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=87.26) [I want to give this a form input of name.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=92.24) [And what I mean by this is I'm going to input this form tag here,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=98.65) [and the path of this is name.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=103.93) [Now, you might be wondering why it's called a path,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=106.24) [and it's because it refers to the binding object for this page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=109.52) [It's actually tied to a backing object that we're going](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=113.97) [to sync up with the model attribute.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=118.33) [Don't worry, we'll show you here in a second what that means exactly.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=120.14) [I'm going to create another tr.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=123.54) [I going to do another td here.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=126.94) [I'm going to give that a call span of 2.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=130.24) [And then inside of that, I'm going to just do a regular HTML input,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=134.38) [and this input we're going to do a type ="submit" and](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=142.09) [give that a value of Add Registration.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=150.31) [Now, we can save this.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=159.26) [And I'll be honest with you, the first time we run this, it's going to break.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=160.41) [And I'm going to make this break on purpose because I want](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=163.96) [to show you the error that it displays.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=166.07) [So when you run into this, because you will at some point,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=168.37) [you'll know how to fix this.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=171.07) [So I'm going to restart my server,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=172.85) [have it pull up that page for us again and deploy everything,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=175.94) [and then we'll have references to this new JSP page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=179.56) [Now, we can go to our Registration link,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=183.94) [and when I click on it, it'll break, and it gives us this error.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=186.21) [Now, one thing that Spring Boot does that I don't really necessarily care for,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=190.64) [is it hides some of that stack trace.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=195.17) [It's not an actual problem because I can see where the error is at.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=197.21) [It tells us Name: 14, td: 15 and 16.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=200.85) [It doesn't know what this form:input path="name" is on line 16,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=205.67) [and it's telling you it doesn't know what to do with Name.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=211.2) [It's because it doesn't have the field in a backing object to tie that to.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=214.09) [Let's fix that now.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=218.84) [Fixing that binding error is actually pretty easy.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=220.64) [We only need to do a couple of things inside of our application.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=223.27) [So I'm going to go ahead and click on](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=227.06) [com.pluralisight.conference right below src,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=229.98) [main, java, not controller.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=233.25) [I'm going to right‑click and say New, Java Class,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=235.98) [and inside of here, I want to type model.registration.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=240.54) [And what this will do is create a new package and class at the same time,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=246.54) [and you'll see that our controllers and our model on the left are separate.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=250.49) [Inside of here, I'm going to just do a private String name,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=256.08) [and then below that, I want to right‑click and generate our getters and setters,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=263.78) [and click OK.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=270.43) [And now we've created that registration object.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=272.99) [I want to go to our RegistrationController now.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=276.24) [Inside of here,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=279.46) [we're going to get rid of that map that we have for that basic model object.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=280.63) [I'm going to replace that with @ModelAttribute,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=284.96) [and we name this ModelAttribute so we can reference it in our page,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=289.4) [and I'm going to call this registration,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=292.49) [and then we tie it to an actual object.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=296.94) [So inside of here, I'll say Registration,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=300.74) [and I'll call the instance of that registration as well,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=304.84) [and now we have our object bound by our model to this ModelAttribute.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=309.91) [One last thing we need to do now is go back over to our registration.jsp page,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=318.43) [go up to our form,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=324.64) [and we want to add the ModelAttribute here of registration and save that.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=327.74) [Now,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=333.43) [if you've looked at old code or you have old code that you're](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=333.69) [upgrading to a Spring 5 MVC implementation,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=337.49) [this used to be called commandName.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=342.73) [That will no longer work.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=345.67) [It's been deprecated and removed.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=347.43) [It will break, and you'll be left scratching your head,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=349.35) [wondering why. It's now called ModelAttribute,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=351.75) [which I like because the name is now consistent.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=354.98) [It used to be inconsistent.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=357.52) [So on line 9 here, this ModelAttribute that we just added to our](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=359.63) [form tag ties to our RegistrationController on line 14 where I](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=363.13) [say ModelAttribute registration.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=368.33) [Those objects are bound together now when we display](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=370.8) [our page. I'm going to save that, pull up our server, and redeploy our server.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=373.59) [And now when I click on our Registration link,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=380.72) [it should pull our page up, and it does.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=382.89) [I will tell you, we're not done yet though, and that's probably not](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=386.73) [what you wanted to hear. If I enter in a a name here, so I just put](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=389.51) [Bryan inside of here and click Add Registration, it's going to break](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=393.24) [because we haven't supported POSTs yet.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=398.05) [We did a GET mapping, but we haven't done a POST mapping.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=400.64) [Really easily, let's switch back over to our IDE. On line 13](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=404.18) [in our RegistrationController,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=408.67) [you can see that we're only supporting GET mappings with this](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=410.54) [method. There is a way to make it to where it will do both a](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=414.07) [GET and a POST in one method.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=418.04) [It's honestly not a good to use case though.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=420.13) [I'm going to go ahead and copy that, and paste it down to a](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=423.26) [new line, and do POST, and then I want to change the method](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=427.73) [name to addRegistration, save that, make sure you've imported everything.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=437.24) [And now, we should be ready to bring that back up to our page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=448.69) [I'm going to go ahead and add a System.out.println here, just so we](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=453.05) [could see the value that's in registration as it comes through. I'm](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=459.37) [going to say registration, and then add just a getter on that](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=462.43) [registration for the Name, and just dump that out to the console.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=472.13) [So I'll save that.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=478.53) [Let's restart our server,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=480.34) [have it pull that up, and now when we click on that Registration link,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=484.13) [it'll display that page.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=487.58) [We can enter our value in here, I'm going to put in Bryan,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=489.01) [click Add Registration,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=493.41) [and it will direct us back to the page because we don't](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=494.68) [have anywhere else for it to go right now.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=496.68) [But if I go back over to our IDE,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=498.67) [we can see in the logs at the bottom of here that it](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=500.68) [printed out Registration: Bryan Hansen.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=503.63) [So it went full cycle.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=505.47) [It went through our GET mapping, displayed the page, went through our POST,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=506.72) [printed out what values we had there, we could do this in a debug mode and](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=511.2) [toggle for a breakpoint there to stop us and see what that value is, but](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=515.99) [this was quick and dirty and got the application up and running to where you](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=520.34) [could see those values and the full lifecycle of our GET and our POST inside](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=523.2) [of that object.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=529.02) [We also just created a simple registration that we bound to,](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=530.64) [and then we created those forms inside of our JSP pages](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=535.74) [that went out and bound it to that object.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=539.12) [We also have validation in there.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=542.21) [We haven't done anything with that yet.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=543.93) [That's in a separate module.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=545.73) [But everything is set up.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=547.21) [It's full featured.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=548.44) [We've got our dispatcher servlet, our GETs, our POSTs, our](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=549.35) [controllers, our model objects that are backing our forms. We have all the pieces of our application set up for us now.](https://app.pluralsight.com/course-player?clipId=dcf40601-577c-4eb2-bc2c-07131107d09f&startTime=552.19)

### [Summary](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159)

[We went through a lot of stuff in this module.](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=1.04) [We talked about the duties of controllers and the](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=3.17) [various annotations associated with them,](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=6.03) [specifically the @Controller annotation,](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=8.55) [the @GetMapping, @ModelAttribute, and the @PostMapping so that we](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=11.96) [could do the full lifecycle of our controller.](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=17.14) [One thing we haven't covered yet, though,](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=19.94) [is what's really going on with how we find those JSP](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=22.01) [pages inside of our application.](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=26.62) [We went ahead and made some modifications to our application.properties,](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=28.64) [but it really didn't help you in understanding how we resolve those views.](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=32.61) [We're going to dive into that in the next module and hopefully](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=37.54) [clear up some of that mystery that goes on with how we find those pages inside of our application.](https://app.pluralsight.com/course-player?clipId=a24a376c-31d9-48dd-be7e-72c914a39159&startTime=39.78)

## [Creating Views in Spring MVC Applications](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934)

### [Introduction](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934)

[We've already started creating some views in our application,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=1.04) [but how we resolve them and how they're intricately integrated into our](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=4.39) [application is a little bit more of a mystery still.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=9.27) [We're going to break that down a little further in this module,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=11.91) [and also discuss how RESTful service types are a type of view,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=15.44) [but not necessarily one that has a UI component.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=19.06) [Views are what we see from Spring MVC.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=23.49) [They are the V in the MVC.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=25.92) [In our application, we're going to look at a few view technologies.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=29.04) [JSP pages are becoming dated, but they still work great.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=32.14) [We're also going to look at templating tools such as Thymeleaf.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=35.83) [We could use JSF for a view technology,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=39.44) [as Spring MVC has an API to replace the model portion of JSF, but a](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=42.01) [lot of people don't use JSF anymore in this manner,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=46.68) [and it actually makes it so that it integrates with Spring well,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=49.16) [but it's just not very useful.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=51.92) [Not many people are developing apps using JSF that way.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=54.44) [Most new apps have moved to a single‑page application,](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=58.39) [and Spring MVC is a great way to expose rough services to be consumed with your SPA as well.](https://app.pluralsight.com/course-player?clipId=c7a400ee-0576-445f-a671-d6c1d0794934&startTime=62.07)

### [Demo: View Configuration](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71)

[Although not required,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=1.04) [there's a convention of placing view pages under the WEB‑INF directory so](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=3.1) [that they cannot be deep‑linked or bookmarked to. This way all requests](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=7.98) [must be directed through our application,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=12.65) [and we can guarantee the user experience.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=14.66) [We already have this set up in our application.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=17.32) [Let's look at what that configuration did for us,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=20.21) [though,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=22.91) [and how it was tied to our application as far as deployments were concerned.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=23.27) [When we converted our application from a self‑contained](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=28.44) [executable JAR file to a WAR file that we deployed on Tomcat,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=32.04) [we created a src main webapp directory,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=35.81) [and you can see that in our project structure over here on the left.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=39.46) [Underneath that, we created a WEB‑INF directory,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=42.53) [a JSP directory,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=46.25) [and that JSP directory contains the JSP files that we have created so far.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=47.58) [Now, why would we do this?](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=52.54) [As I mentioned,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=54.06) [it's to make it so that people can't deep link to our application.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=55) [And if I switch over to my browser,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=59.64) [we have our page that we've set up links to, but if you](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=62.14) [remember when we added these links, they were a reference to the service call.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=65.73) [So we were doing a call to the controller to route us](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=72.01) [back to the page that we wanted.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=75.75) [What happens if we come over here and we type in registration.jsp.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=78.26) [It won't serve that up, and we don't want it to serve that up.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=86.45) [That's by design.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=90.09) [So putting those pages underneath our WEB‑INF folder and a JSP](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=91.55) [folder makes it so that they have to be served up internally](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=95.99) [and turned back to our end user,](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=99.45) [thus making it to where we control the state of how they flow through](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=102.84) [the application, and they can't bookmark into things that we don't want](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=106.73) [them to. It's a lot better designed for us. All we had to do was just move that under that WEB‑INF folder.](https://app.pluralsight.com/course-player?clipId=27de543d-5db1-488c-bc36-5f19dc7a1c71&startTime=110.88)

### [Demo: View Resolver](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9)

[In our first demo, we configured an InternalResourceViewResolver,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=1.04) [and didn't even realize it.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=4.97) [We've used that in all of our controllers since then.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=6.54) [We simply return a string,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=9.65) [and that is what's used by the ViewResolver to find the JSP page named](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=11.44) [and in the location specified with our resolver.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=16.33) [We can also return a view object that wraps a string](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=19.54) [that is the view name as well.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=22.87) [Our controller can build a model if necessary and return that to our](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=25.08) [ViewResolver with data that is needed in the view.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=28.63) [We can also have multiple ViewResolvers,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=32.55) [as well as multiple view types in our application.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=34.44) [Let's look closer at that ViewResolver we've been using and](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=37.75) [not really realizing that we had created it.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=40.91) [As we saw earlier in our controllers,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=44.29) [I'm going to open up our RegistrationController, we're just returning a](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=46.9) [string of a name. On line 22 here we have return registration,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=52) [and that's referring to our registration JSP.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=58.56) [You may or may not recall that we configured two lines inside of our](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=62.4) [application.properties, the spring.mvc.view.prefix and the](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=66.12) [spring.mvc.view.suffix, and this tells it where those files are](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=70.9) [located and what extension to look for.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=75.64) [So really it's taking that name that we have in our](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=78.69) [RegistrationController and pre‑appending the prefix and](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=81.92) [appending the suffix to that file to serve it back to our UI,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=88.12) [so that's how it knows where to find this.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=94.1) [Now how did it know how to do that?](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=96.71) [Well, in our ConferenceApplication configuration,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=98.47) [we have this @SpringBootApplication, and we extend](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=102.08) [that SpringBootServletInitializer, and this configures it for us.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=106.48) [But let's show you how to override that.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=111.64) [Let's create a new class, and to do so we're going to put it](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=114.74) [alongside the ConferenceApplication. We're going to](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=117.5) [right‑click and say New Java Class.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=120.48) [We're going to call this ConferenceConfig.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=123.24) [You can honestly name it anything you want,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=127.34) [it doesn't matter. And we're going to define a couple of things inside of here.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=129.32) [First of all, we're going to designate this as a Configuration class,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=133.49) [so we're going to annotate that with the @Configuration annotation. Then](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=138.01) [inside of here we want to create a Bean. We're going to create @Bean, and](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=142.71) [this Bean we're going to make a public ViewResolver, and this will just](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=150.46) [return an instance of viewResolver. It can be named anything we want. Inside](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=162.9) [of here, we're going to create an InternalResourceViewResolver, and this](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=168.02) [bean is nothing more than what's already being defined for us in that](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=175.65) [application.properties.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=183.54) [So I'm going to show you the same code side by side](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=186.03) [here before we comment it out.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=188.57) [I want to say bean.setPrefix, and we want to add in here](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=190.44) [WEB‑INF/jsp/, and then we want bean.setSuffix. We want to add](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=197.83) [quotes inside of there and say .jsp as well.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=214.39) [Then we want to set the order, and this just tells it if we have](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=219.04) [multiple ViewResolvers, which one we want to fire in which order, and](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=222.08) [whichever one is first successful is what it will return. And then we](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=227.79) [want to return the bean at the end.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=231.75) [Save this.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=237.24) [This is all of the configuration that's done for us](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=238.83) [behind the scenes with that ConferenceApplication](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=241.98) [annotation being SpringBootApplication.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=246.05) [So this main class that would launch our application if we had it](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=248.86) [self‑contained, it still gets read off the class path,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=252.28) [and the SpringBootApplication has a component scanner in there that](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=256.21) [tells it to go look for any other class labeled as a configuration, and](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=259.98) [inside those configurations load up the beans.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=263.8) [Now, these two lines, line 14 and 15, are the exact same](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=266.58) [lines inside of our application.properties.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=270.61) [So I can now comment out line 1 and line 2, and save that, and you'll](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=273.42) [see that line 14 and 15 will take place of that.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=280.27) [I'm going to restart my server, and now we can test that our](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=283.87) [ViewResolver is doing what it should be.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=287.75) [I'm going to click on that registration link, and it](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=289.26) [did, it served those pages up for us.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=291.91) [So looking back at our editor again,](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=294.29) [line 14 and 15, and really this whole method of 12 through 17, sets up](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=296.91) [the ViewResolver that's already preconfigured for us.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=303.22) [And now we can override things and do various changes to this](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=305.87) [that aren't really exposed through those properties like we](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=310.23) [have in the application.properties.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=314.12) [We started using that to begin with, we can convert it over to this.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=316.34) [We are going to add other ViewResolvers inside that config as we do](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=319.52) [more things to our code. So we'll leave this here, and it's a good base for what we want to move forward with.](https://app.pluralsight.com/course-player?clipId=a374b68c-c06c-4e77-b514-e483460e0bb9&startTime=324.95)

### [Resolving a View](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17)

[Views are resolved in Spring MVC by the controller building a](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=1.04) [model that it passes to a view resolver,](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=6.77) [which then will determine the correct view that we want to display and](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=11) [choose the appropriate view based off of that request. And there are](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=15.61) [various view resolvers that are provided by Spring.](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=20.83) [You can create your own custom view resolver,](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=23.71) [since they just extend the ViewResolver interface.](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=25.99) [Some of these resolvers are used for templating](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=29.34) [tools like Thymeleaf or FreeMarker.](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=31.82) [It just configures where it should be looking for those templates and then](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=34.55) [executes the bindings and writes the output. The ResourceBundleViewResolver](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=37.75) [is used for internationalization purposes,](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=43.09) [and it's used for things like templated layouts. In](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=45.44) [a later example in this course,](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=50.53) [we're going to look at XML content negotiating and how to](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=52.26) [respond with JSON responses versus HTML or JSP responses, and we'll walk through one of those examples.](https://app.pluralsight.com/course-player?clipId=8f230d72-2ec6-4289-9ad6-39f05848ac17&startTime=56.09)

### [Resolve Static Files](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5)

[There are actually a lot of reasons why we would want to host up static](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=1.04) [files from with inside of our Spring MVC application.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=5.51) [We may want to implement security on them,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=9.47) [we want to make sure they're logged in, we could possibly do some caching stuff.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=11.89) [Regardless, it's really easy for us to do.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=16.35) [It's very similar to what we just did with the view resolver,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=18.92) [except we're going to add a resource handler.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=21.66) [We do have to implement one interface, and we'll walk through that,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=23.82) [but then we just add it to the registry of the Resource Handler Registry,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=27.41) [and we say that, hey, any request to files,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=31.37) [I want you to go ahead and look in this directory,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=34.64) [and we've created a WEB‑INF/pdf/ directory,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=36.83) [and we can host up static files from there that are PDFs.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=40.91) [Let's walk through this configuration in our code now.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=44.13) [To host up static PDFs,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=48.37) [I'm going to start by creating a PDF directory alongside of our JSP directory.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=49.87) [I'm going to right‑click on WEB‑INF and say New Directory, pdf, hit Enter.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=54.97) [Then I have a sample PDF I just grabbed off of my file system,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=60.87) [and I encourage you to do the same, and just drag that PDF into your application.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=66.1) [It's going to ask you if you want to copy that in, and we'll say yes.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=72.54) [Then we want to implement an interface.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=79.99) [Now we have this configuration class set up,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=82.4) [but we're going to implement this interface and use](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=84.14) [it to override some functionality.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=87.12) [So I'm going to say implements WebMvcConfigure,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=88.77) [and then I want to add in here a resource handler.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=94.53) [So I'm going to add in the addResourceHandler's method that overrides the](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=102.39) [implementing basic functionality that's currently there,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=106.61) [and say registry.addResourceHandler.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=110.1) [I'm going to put in a path of /files/\*\*.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=111.64) [So it's going to look for anything in that path,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=118) [and then I'm going to specify the location of where we](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=120.13) [just created that directory structure, /WEB‑INF/pdf/.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=123.58) [So that resource location needs to match exactly what you](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=127.27) [named your folder underneath WEB‑INF.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=132.54) [If you added an s on the end or something like that,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=135.09) [it's a common mistake I've seen people make.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=137.82) [It needs to be identical.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=140.3) [Let's save that, restart our application server, and see](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=142.62) [if that will host up our PDF for us.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=146.77) [Now that we are at our browser,](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=149.68) [we can go up to our address bar and type in files/ps.pdf, because you'll](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=151.68) [remember in that resource handler, that was the path that we wanted it to](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=159.62) [resolve to, and hit Enter, and it will serve up our PDF.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=163.68) [And it works just like we thought it did.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=168.05) [Let's look at that configuration in that configure again one more](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=169.94) [time. You can see on line 15 where we told it to go to /file/\*\*, and](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=174.08) [on line 16 where we told it to locate those files under](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=181.13) [/WEB‑INF/pdf/. That's all it took for us to resolve static files hosted from inside of our application.](https://app.pluralsight.com/course-player?clipId=89e51738-c1cf-4b95-a506-44fc7d883bb5&startTime=184.34)

### [Summary](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03)

[In this module, we looked at some of the deeper configuration](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=1.04) [of Spring MVC and how it resolved views and did various](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=5) [things inside of our application.](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=9.18) [We looked specifically at the views and view resolvers, and how](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=11.07) [if you followed that convention of just adding those two lines](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=15.07) [in the application.properties, it could find files for you.](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=18.56) [We then rode our own custom view resolver to show you how it was](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=22.64) [implementing that functionality, and then we showed you how to create](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=26.34) [your own handler to serve up static resources. Specifically, we did an](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=30.97) [example with PDFs inside of our application,](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=36.43) [which wasn't super complex, but did show you the power of having your own](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=39.04) [custom path that went to a different place on your file system.](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=43.12) [This way you wouldn't have to expose files off of your file system,](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=47.29) [but rather could host them up through your app and even wrap security around](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=51.36) [them if you wanted to. Let's now dive into some of the deeper configuration things that we can do with JSP pages in the next module.](https://app.pluralsight.com/course-player?clipId=cf822436-5ca8-4d8f-9031-ef5808236c03&startTime=55.21)

## [Using Java Server Pages with Spring MVC View](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479)

### [Introduction](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479)

[We have already been creating JSPs throughout our application,](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=0.84) [but there are a few features and techniques that we haven't done yet that](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=4.92) [are very useful while developing applications using JSP pages. We're going](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=8.63) [to cover interceptors and internationalizing our application, talk about the](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=13.81) [other interceptors that are out there that are common, and then we will](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=18.06) [discuss a common architectural problem and how to solve that using the Post/Redirect/Get pattern.](https://app.pluralsight.com/course-player?clipId=e79129b6-b826-4a53-90e1-91a4b11d5479&startTime=21.31)

### [I18N and Interceptors](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201)

[If you weren't aware, I18N stands for internationalization.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=1) [It literally means there's 18 characters before the beginning I](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=6.14) [and the trailing N of the word internationalization. To this](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=10.44) [point in our course, we haven't been internationalizing our pages](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=15.29) [to accept other languages.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=18.96) [Everything has just been hardcoded. This same code](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=21.03) [internationalized that we have here,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=24.86) [where we've got firstName and lastName and the Save Changes text](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=27.03) [just hardcoded in English would look like this.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=31.62) [Notice that we have removed any of those references to just plain English](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=37.13) [language in here and are now grabbing them from a resource bundle.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=41.16) [FirstName, lastName, and the Save Changes text are all pulled from that bundle.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=45.65) [Even notice that the case with the Submit button is changing the value of that](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=52.28) [actual button and not just the label on the page. To do this,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=57.92) [though, we need to introduce a new concept,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=62.14) [and that is interceptors.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=64.28) [Interceptors are used to allow us to intercept calls to our](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=66.24) [server and perform special tasks on a call.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=69.62) [Common uses for interceptors are logging.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=73.74) [We can change the log level on an application without having to redeploy it. Not](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=76.35) [useful to end users but very useful for debugging a specific problem in an](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=82.58) [environment without having to restart the application.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=87.29) [Another common use is security.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=91.74) [When we want to intercept each call or direct them to a page,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=94.54) [make them log in and then redirect them back to that page that they were](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=98.1) [trying to access, it's a very common use of an interceptor.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=101.5) [Security is outside the scope of this course,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=105.61) [but there is a separate course that is focusing on the use of Spring Security](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=108.21) [in your applications here on Pluralsight. As we mentioned earlier, I18N](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=111.64) [internationalization of sites and catching their request to change locales is](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=116.77) [a very common use of interceptors. And, lastly,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=120.96) [performance monitoring. Similar to logging, this is not](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=124.24) [something we're going to display to the end users,](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=128.68) [but we may want to intercept each call to perform](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=130.91) [some metric gathering on a request. Let's add internationalization support to our application now.](https://app.pluralsight.com/course-player?clipId=8aa58d92-afc0-4e25-9cd6-811b90122201&startTime=133.62)

### [Demo: Adding Internationalization](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12)

[To begin adding internationalization to our application,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=1.04) [we want to start by opening up our ConferenceConfig,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=4.25) [and we're actually going to add three beans inside of here.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=7.5) [I'll make this full screen so it's a little easier for you to see.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=11.81) [The first thing we're going to add is a SessionLocaleResolver,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=15.7) [and this will just use the LocaleResolver interface,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=22.65) [but the SessionLocaleResolver's what ties our current session to a locale.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=26.33) [And this bean is just going to take and create an instance of the](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=33.21) [LocaleResolver and put it out in our Spring registry for us.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=40.15) [I've gone ahead and pasted this in.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=44.54) [You can see we start off with a default locale of Locale.US.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=47.24) [You can change that to your specified region if you want,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=52.04) [but this is what I'm going to start with.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=55.28) [The next bean that we're going to add in here is the LocaleChangeInterceptor,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=57.57) [and the LocaleChangeInterceptor just looks for a parameter,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=63.62) [either through a hidden element or on our URL string as a query parameter,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=71.01) [however we want to pass that in,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=78.29) [but it looks for that to see if it should intercept that change.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=80.38) [And you can see on line 35 here that we are looking for the param name of Lang,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=84.84) [L‑a‑n‑g.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=90.98) [Now the next thing we need to add actually isn't a bean.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=94.74) [It's going to be a feature that we override from the WebMvcConfigure,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=97.59) [and it's the interceptor we're going to add.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=103.58) [So we just created this LocaleChangeInterceptor.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=106.82) [Now we're going to register it,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=110.33) [and I like to keep all the things that we've overridden at the top](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=112.54) [where we're going to be making those changes to that](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=116.37) [WebMvcConfigure and the beans defined down below.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=118.69) [Really, it's just personal preference.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=122.42) [It doesn't matter.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=123.74) [Anywhere you put this in this file will be fine.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=124.44) [Those are the three things we had to add to the ConferenceConfig.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=127.06) [Now we want to go ahead and create two properties files,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=131.53) [and I'm going to do that by right‑clicking on our src,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=135.64) [main, resources directory and say New, File.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=138.88) [And for the name, I'm going to type in messages.properties,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=143.94) [and the name matters here.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=147.45) [So notice its messages, plural.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=150.41) [I'm going to hit Enter.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=151.98) [And the first thing I'm going to put inside of here is a comment.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=154) [I'm going to do labels, and this is just for personal preference.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=157.29) [And then give it to the name‑value pair of Name.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=163.24) [And then I'm going to throw another comment in here for buttons,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=167.94) [and the name‑value pair of save.changes=Save Changes,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=171.26) [and save it.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=181.21) [Now we want to add another properties file out here.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=183.79) [I'm going to right‑click on our src, main,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=186.8) [resources directory again and say New, File,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=188.86) [and the name of this one's going to be messages\_es.properties.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=192.83) [And this is specifically for the Spanish translations.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=201.44) [So in here, I'm going to do the same thing, except I'm going to cheat.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=205.64) [I'm going to just grab this text that we just typed out,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=208.78) [copy it, and paste it inside of here.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=212.04) [I'm going to change it to the Spanish translation of Nombre.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=215.83) [And we'll change Save Changes, cambios.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=223.04) [There we go.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=232.34) [And we have our two properties files,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=234.03) [and the locale that we pass in with that change interceptor is](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=237.69) [going to go look for the appropriate properties file and pull](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=241.26) [that translation out of that file.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=244.88) [Now let's open up our registration.jsp page,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=247.94) [and this is pretty simple, but we have to add two pieces inside of here.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=251.87) [First, we want to start by adding another tag library at the top of our page.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=256.53) [We'll say %@ for the tag library,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=260.51) [and we're going to give this a prefix of spring.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=269.24) [And for the URI,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=272.79) [we want to choose the http://www.springframework.org/tags and save that.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=274.68) [And now we can come down to this text for Name,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=284.41) [and we'll change that to be the spring:message tag.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=288.25) [And the code="name".](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=296.33) [And then make sure you close that tag off.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=301.04) [So we can save that,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=303.56) [and you can go through and change all of the fields as we go.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=305.6) [I'm going to start my server up just to show you that this is](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=309.03) [working the way that we expect it to work.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=313.55) [And now it's launched our browser for us.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=316) [I can click on the registration link, and to begin with,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=318.71) [it shows up with Name in English.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=321.69) [But if I had a query parameter on the end of here and say](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=326.21) [language=es for Spanish and hit Enter,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=330.88) [notice that it will translate Name to Nombre,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=334.96) [and it will also ask us if it wants us to translate](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=339.89) [this page for us automatically.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=343.27) [So you can see that we are now using that internationalization.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=345.2) [And you can go through and change the title of the page,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=348.07) [the buttons to say Submit changes or Save changes or to add registration,](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=350.97) [whatever translations you want to go through and add.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=355.94) [You can see we have all the pieces now set up to do internationalization inside of our app.](https://app.pluralsight.com/course-player?clipId=fc318a5d-3bb9-4398-8a64-d9e88ae66c12&startTime=358.39)

### [Post-Redirect-Get](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff)

[The Post/Redirect/Get pattern, or PRG,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=1.08) [is a technique used to help eliminate form resubmission.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=4.41) [The user's POST to the controller does whatever intended action was requested,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=9.1) [but before returning the view back to the user,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=13.55) [it does an internal redirect and issues a GET back to](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=16.69) [itself to display the page to the user.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=20.37) [This makes sure that all the variables of state have been cleared,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=23.6) [so a back button then resubmitted is disabled or stopped.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=27.28) [Let's implement this in our app now.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=31.94) [We've already done all of the work that we need to for us to](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=34.74) [implement the Post/Redirect/Get pattern because we've set up our](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=38.73) [GetMapping and our PostMapping separate.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=43.09) [A lot of examples out there show these being combined.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=45.47) [All we actually needed to do is go to line 22 now and](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=48.32) [put in redirect: and save that,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=52.51) [and this will tell the ViewResolver to go ahead and do a](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=56.77) [complete redirect and a GET back to registration, and it will](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=60.68) [clear that form out for us. Now, yes, you can still back up,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=65.19) [but it will be a new,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=69.74) [completely separate POST. It won't be reposting the same information,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=71.02) [if that makes sense. So let's save this, start or restart our server](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=75.65) [depending on what state you left yours in.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=81.07) [And now we can go to our registration link, and inside of here,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=84.29) [if I put in my information and click Add Registration,](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=89.01) [notice that it has submitted it and returned us back here and cleared it out.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=92.81) [So we've done the whole GET, and then a Post/Redirect/Get back to](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=98.94) [ourselves, and it's cleared this form out. And that just helps us](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=105.18) [have that information in a safer state to not resubmit or overwrite the existing page that's there.](https://app.pluralsight.com/course-player?clipId=5a893cdf-1616-4cd7-9c9a-8b4bfc1437ff&startTime=108.52)

### [Summary](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586)

[Although this is a shorter module, we went over a couple of advanced techniques.](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=0.94) [We went over interceptors, and we implemented internationalization](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=5.62) [inside of our application using some resource bundles,](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=10.08) [specifically a Message.Properties properties file and the](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=14.21) [according file for the Spanish translation.](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=18.51) [And then we went ahead and implemented a post‑redirect‑get](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=21.94) [pattern, a PRG, inside our controller using the redirect](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=26.94) [preappend to the page we want of view.](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=32.66) [Both of these are great solutions to complex problems that you'll often face](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=35.33) [inside of your application, and they don't just work for JSPs.](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=40.41) [You could actually implement these same things if you're using Thymeleaf or any other view technology integrated with Spring MVC.](https://app.pluralsight.com/course-player?clipId=c3c0e711-996a-475f-b300-9e1380a0e586&startTime=43.74)

## [Using Thymeleaf in Spring MVC Views](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121)

### [Introduction](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121)

[Not everybody wants to use JSP pages and would rather have](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=1.04) [a lightweight view framework instead.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=4.6) [If you aren't a serious JavaScript developer,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=7.34) [but still want to use a lightweight HTML5 for an end,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=10.06) [you can use a templating framework.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=13.84) [Thymeleaf has some of the best integration with Spring of any](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=16.14) [of the templating frameworks out there.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=19.08) [Thymeleaf was somewhat adopted as the lightweight HTML5](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=22.24) [framework by a Spring development community and just sort](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=26.04) [of fit a gap that existed there.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=29.23) [It is quite easy to use and only requires minor setup inside of our application.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=31.74) [Although there are other templating tools that work with Spring,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=36.42) [Thymeleaf remains to be one of the easier](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=39.79) [full‑featured ones out there to implement.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=42.91) [And if you are using Spring Boot and self‑contained jars standalone,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=45.28) [it's actually the version that they recommend in the](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=51.6) [templating tool that they encourage you to have inside of](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=54.1) [your application over anything else.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=57.4) [I will say before we go any further, though,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=60.44) [I would make a backup of your source directory because we are](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=62.84) [going to break the JSP functionality in this demo.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=66.76) [I'm going to reverse it at the end, but if you want to save yourself a headache,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=69.75) [just copy your source directory and your POM file,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=73.33) [and when we're done with this, write back over the top of it,](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=76.22) [and you'll be good to go.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=79.49) [You could also download the exercise files and look at these examples from there as well if you don't want to change your current project.](https://app.pluralsight.com/course-player?clipId=8ac53073-81eb-44f0-b3eb-11ead479c121&startTime=80.56)

### [Demo: Thymeleaf Configuration](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9)

[To add Thymeleaf to our project, it's actually quite easy.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=1.04) [We just need to add another Maven dependency.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=4.12) [So we're going to build a dependency element.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=7.31) [We're going to add in a groupId of org.thymeleaf,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=9.96) [an artifactId of thymeleaf‑spring5 because we are using spring5,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=14.08) [and then the version of 3.0.11.RELEASE,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=19.47) [as that is the current release at the time of recording this course.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=22.76) [Let's go ahead and add that into our POM now and verify](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=27.94) [that it's downloaded it to our project.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=31.86) [Adding that to our POM is as simple as opening up the pom.xml file,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=34.11) [and I'll make mine full‑screen so you can see it a little bit better.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=39.52) [I'm going to go underneath our spring‑boot‑starter‑tomcat,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=43.33) [but above the spring‑boot‑starter‑test.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=46.83) [And yes, order does matter in your dependencies.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=49.48) [It will load those onto your class path in the order in](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=53.06) [which you have them in this file.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=57.07) [So, I want to go ahead and add that in there, I've just got](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=59.33) [org.thymeleaf, thymeleaf‑spring5, and version 3.0.11.RELEASE.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=64.91) [I'm going to save that, and when I save it,](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=72.48) [it'll automatically download that from the Maven repo. And I can verify](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=74.1) [that it's in my project by scrolling down to the external dependencies](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=79.08) [of my project structure, looking at the very bottom, and you can see](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=83.53) [that I've got org.thymeleaf:thymeleaf:3.0.11 and](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=87.16) [org.thymeleaf:thymeleaf‑spring5:3.0.11.RELEASE, so I've got everything](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=93.43) [in there for the Spring versions that I'm using and the Thymeleaf](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=99.2) [dependencies that I need.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=102.62) [I'm going to close this back over and get it ready for us to](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=104) [add the rest of the code in our project. Let's look at what it takes to add the resolvers in here now.](https://app.pluralsight.com/course-player?clipId=a7ccd28c-e8ea-457d-a727-3713c224acb9&startTime=106.54)

### [Template Resolver](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef)

[A template resolver is not the same as a view resolver. When first looking](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=1.04) [at the template resolver, it actually feels just like a view resolver that](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=6.99) [we've seen quite a few times in this course now.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=10.69) [But this configuration in here is actually where to locate the](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=13.22) [template files and how they should be resolved.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=16.78) [The view resolver, which we will configure later,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=20.17) [just sets the order and references this template resolver we'll use.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=22.41) [Let's configure the template resolver in our project now and then we'll](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=27.03) [configure the view resolver in a minute. We need to configure a couple of](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=30.82) [beans for our application to resolve those template files.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=35.25) [I'm going to do that inside of our ConferenceConfig.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=39.88) [So as I open that up, I'm going to just scroll to the bottom and go below our](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=43.1) [ViewResolver, but before our closing curly brace, and I'm going to add in this](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=47.56) [templateResolver. To do so, I want to go ahead and import all of these](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=52.44) [resources that I have. And you can see we created an instance of a Spring](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=59.84) [templateResolver just named the method templateResolver. And inside of there,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=65.19) [we have a SpringResourceTemplateResolver. We set the applicationContext. Notice](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=69.88) [that's still red.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=75.26) [We're going to fix that.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=76) [And then we set the prefix of WEB‑INF/views and](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=77.38) [templateResolver suffix of .html. Now to fix that](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=82.37) [applicationContext, I'm going to scroll up to the top.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=88.82) [Now we haven't done this yet in our application,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=93.45) [but it's really common to use an applicationContext inside of our file.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=96.2) [So I'm going to import an annotation for @Autowired,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=102.42) [and I'm going to create an instance of the application context](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=106.2) [for it to be autowired into our application,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=111.64) [and that's all I have to do.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=116.74) [I am going to make that private just so that nothing else in the](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=117.78) [package utilizes it because we'll want autowire and inject that](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=120.47) [wherever we're going to use it.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=124.33) [Now if we scroll back down, that is purple instead of red,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=126.15) [and the colors may not show up super good for you,](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=130.28) [but we've resolved that dependency.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=133.4) [So we have our templateResolver in here now. Now we can go configure a template engine that will utilize this resolver.](https://app.pluralsight.com/course-player?clipId=7138d5fd-df54-4be7-b9f2-e63f06c7c2ef&startTime=135.45)

### [Template Engine](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a)

[We didn't have to create an engine of any sort when we were using JSP Pages,](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=1.04) [so this is a little bit unique to Thymeleaf.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=5.76) [We have to create a Spring templateEngine that will process](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=8.39) [the pages and substitute in the model values from Spring](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=13.36) [into our pages to be displayed.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=17.11) [Notice that this code makes a call to that templateResolver method](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=19.44) [that we just created in the previous example.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=23.26) [Let's go ahead and add this into our ConferenceConfig file.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=26.01) [Now the templateEngine is just another bean and can actually go right](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=29.39) [below the templateResolver that we just created.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=34.22) [I'm going to paste this code in here and import it as well,](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=37.4) [and it stands alone on its own.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=43.94) [It doesn't have a bunch of other references other than](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=45.65) [that call to the templateResolver.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=48.38) [So on line 72 you can see where it's calling the](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=50.58) [templateResolver that we just created on line 61.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=54.21) [We have this templateEngine that is configured just for Spring,](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=57.34) [and it also has enabled the Spring Expression Language compiler,](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=62.97) [the EL compiler,](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=67.32) [and that just makes it so we can use the shorthand syntax of](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=68.29) [accessing Spring variables and passing them in.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=71.77) [That's it.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=74.57) [That's all we have to add for the templateResolver.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=75.01) [Now we can add the actual ViewResolver for those templates that the controller can navigate things to.](https://app.pluralsight.com/course-player?clipId=8ffae23e-98e5-4137-b6e8-fa98639c073a&startTime=77.31)

### [View Resolver](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e)

[And finally, we have a ViewResolver.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=1.04) [The ViewResolver is a little bit different because the](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=3.61) [TemplateResolver looked up the actual template.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=7.15) [The ViewResolver just takes whichever template was loaded](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=10.78) [and returns that based off the name, so they kind of work in conjunction.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=14.65) [I will tell you now, though,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=19.79) [that the viewResolver.setOrder that you can see in](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=21.75) [the middle of our method here,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=25.01) [that has to be before the JSP page in this example for it to work.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=26.88) [So we're going to change the order of our JSP viewResolver to 1, and this to 0.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=33.03) [If not, it'll look for JSP's name this way.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=39.06) [It is possible to configure them to work together,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=41.88) [but it's kind of outside the scope of this course,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=44.72) [and specifically this example.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=47.05) [Let's add our ViewResolver, and our template page,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=49.43) [and any other configuration we need to to run the rest of this demo now.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=53.9) [To add the viewResolver for the Thymeleaf pages,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=57.57) [I'm going to go ahead and give myself a little bit of whitespace](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=61.93) [below the ViewResolver we have for JSP pages,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=64.31) [and I'm going to paste that code in there.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=68.04) [I've already got it written.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=69.66) [The thymeleafResolver, as we mentioned earlier,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=71.44) [is real simple because it calls the TemplateEngine.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=73.57) [One thing I am going to change, though,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=76.37) [is you'll notice how line 57 and line 65 in my code](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=78.36) [are both set to an order of 0, I want to change that setOrder on line 57 to 1.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=82.95) [This will make it to where the thymeleafResolver pulls our page up first.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=92.14) [And as I mentioned earlier, and I'm going to mention again,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=97.18) [we are currently breaking the JSP functionality of our](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=99.74) [application to show you the thymeleafResolver.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=103.08) [It's outside the scope of this course to have both Thymeleaf and](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=106.54) [JSPs working together in the same application,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=110.38) [and it's really not a common occurrence.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=113.2) [Most people don't do it that way.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=115.48) [They usually choose one or the other.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=116.88) [Now that we have that set up,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=120.1) [I want to go out to our WEB‑INF folder and create the views](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=121.82) [directory that's being called by our templateResolver.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=126.52) [So I'm going to right‑click on WEB‑INF and say New, Directory, and](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=131) [I'm going to type this as views. Inside of here, I want to create a](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=137.42) [new HTML page. So I'm going to say New, HTML 5, and I'm going to name](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=143.59) [this thyme.html, and hit Enter.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=149.49) [It comes up with a very basic HTML page for us. To make this a Thymeleaf](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=153.84) [page, I'm actually going to just replace the contents inside of here and](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=160.73) [talk through the two pieces that we have.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=164.3) [We have a HTML namespace on line 2 that's really an xml namespace that](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=167.14) [HTML is utilizing of thymeleaf.org, and we can now use those elements](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=174.03) [that that namespace defines as we have on line 8 where we're calling the](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=179.76) [th:text with the message in there. So this will pull out a message that](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=183.86) [we haven't yet defined.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=188.9) [You'll notice that it's currently read on line 8 because it](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=190.53) [doesn't know where that's coming from,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=193.1) [and that's because we have nothing to route to this page yet.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=194.58) [Let's go up to our controllers, and specifically our](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=197.64) [greeting controller, and open it up.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=200.62) [And let's add in a request to actually load this page and display that](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=204.02) [element that it's stopping on telling us that there's nothing to find](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=209.94) [calling it. I'm going to actually copy that greeting that we already have](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=212.99) [and paste that down below here, and change this to work for the thyme](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=218.18) [page that we just created.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=222.52) [Call it thyme,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=224.82) [and we're going to return to that thyme.html page that we just made,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=225.91) [and let's just change this to Hello Thymeleaf.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=230.42) [Save that. Now we have all of the pieces together](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=236.3) [in our application to run this.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=239.27) [Let's exit full screen, start up our server, and go](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=241.7) [see what this now looks like.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=245.28) [Here's our browser page,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=247.54) [just like we would expect it to show up. The difference is now we can come](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=248.81) [up here and type in thyme, and it will go through and pull that page out](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=252.56) [for us and show us the Hello Thymeleaf that we just added into that](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=258.12) [message property. It works pretty well.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=263.36) [I will tell you, though, that if we back up right now and hit our greeting link,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=266.11) [it's going to break.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=269.96) [We're going to get that 500 error.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=270.86) [So I'm going to back out the changes that we made for Thymeleaf.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=272.56) [I wanted to show you how to integrate it, and you can see it,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=277.9) [you can use everything that we have already taught you with](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=280.26) [JSPs works with Thymeleaf pages,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=283.91) [but the two just aren't configured to run alongside of one another.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=287.02) [But you can see how Thymeleaf works,](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=290.78) [how it's really lightweight, it's really centered around HTML 5, and it doesn't have some of the nuances that JSP pages have in there.](https://app.pluralsight.com/course-player?clipId=4c1ae656-1f64-4310-990d-ec44b079d66e&startTime=292.53)

### [Summary](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50)

[In this module, we talked about using Thymeleaf and how it is a templating tool,](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=1.04) [and we integrated the dependencies for it inside of our application.](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=5.88) [Then we configured the template resolver and the](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=9.58) [template engine and the view resolver,](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=12.36) [and how that's a little bit different using templating versus just straight](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=14.6) [JSP pages, that the view resolver doesn't do much; the template resolver is](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=20.18) [what's doing a lot of the heavy lifting for us.](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=24.22) [As a reminder,](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=26.3) [I am going to back out these changes for Thymeleaf, because we did break](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=27.61) [our JSP pages. So set that bean over to a priority of 0. That should get](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=32.06) [you enough to get it running and not have to remove everything, but if you](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=38.14) [want to remove all the Thymeleaf stuff, you're more than welcome to,](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=42.12) [and it'll just clean up your project for you, like I'm going to do.](https://app.pluralsight.com/course-player?clipId=9204097c-e46d-4f75-a0aa-2bb258c0ac50&startTime=44.95)

## [Validating Objects in Spring MVC Applications](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3)

### [Introduction](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3)

[Validation is always an interesting subject in applications and](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=1.04) [doesn't ever seem to be really handled cleanly.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=5.06) [When I first recorded this course, the spec for this was JSR 303.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=8.04) [Since then, they've made subsequent JSR releases to work with newer JVMs.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=12.82) [JSR 303 was the original specification for Bean Validation and,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=17.5) [although it worked this past release, its target was really for JSE 5.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=22.75) [It works quite well and it has since its initial release,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=28.74) [but took a little time to gain adoption.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=32.53) [In keeping up with the Java specification releases, JSR 349 targeted Java 7.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=35.44) [It cleaned up ambiguities with Beans spec 1.0,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=42.37) [and 349 is version 1.1 of the specification.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=45.55) [JSR 380 was released as of Java 8 and focuses on the modularity](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=50.44) [changes that were introduced in Java 9 and later.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=55.21) [It is version 2.0 of the Bean Validation spec,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=58.94) [and there are a few major changes with 380.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=62.2) [That is what we're going to focus on in this module,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=65.68) [and you can now utilize type Lists and other things such](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=68.21) [as Java Optionals in the 2.0 spec.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=71.69) [If that doesn't quite make sense,](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=74.7) [don't worry, we're going to walk through some examples and it should by the end of this module.](https://app.pluralsight.com/course-player?clipId=df3064bc-92a4-488e-87b3-39b94bbc7fc3&startTime=76.2)

### [Validator Interface](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c)

[There is another approach that we're not going to show,](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=1.07) [but I want to spend a minute talking to you about it,](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=5.04) [and that is the Validator interface.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=7.31) [It was the approach that we used before the JSR 303](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=10.34) [and subsequent releases came out.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=14.79) [It works fine, just as it did 10 years ago when it was released,](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=17.46) [but it's very programmatic.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=21.34) [You have to manually type out every line of code](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=23.74) [that you want to have it execute.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=26.88) [It is not deprecated,](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=29.14) [and you can in fact still use it in modern Spring applications today.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=30.76) [I personally try to avoid it because business logic](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=36.04) [tends to creep into these validators.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=39.14) [The separation of concerns that we spoke about in an earlier](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=41.57) [module becomes a little hazy in these Validator classes that](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=45.18) [implement the Validator interface.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=49.36) [For this reason,](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=51.89) [I tend to avoid the Validator interface and](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=53.13) [implementing classes and just used the JSR.](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=56.37) [More advanced validation I move into my own custom class inside the](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=58.79) [service tier and handle it appropriately there. Let's move on to how we configure Bean validation](https://app.pluralsight.com/course-player?clipId=1e58870f-3fa9-4e2b-a512-e835d9f10b5c&startTime=64.64)

### [Demo: Validator Configuration](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed)

[The bean validator reference implementation is actually an instance of](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=1.01) [hibernate‑validator. To configure it for spring, we just need to add it to](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=5.73) [our class path and begin validating objects.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=10.55) [It doesn't matter if you are using Hibernate the ORM tool, the](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=14.09) [validator is actually just the reference implementation and](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=18.39) [has nothing to do with databases.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=21.61) [Let's add the hibernate‑validator dependency to our project. We want](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=23.98) [to open up our POM file, and I'm going to put that below our Tomcat](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=28.69) [starter, but above our starter test,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=35.99) [and I'm just going to add that code in there.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=40.11) [We want to have a group ID of org.hibernate.validator, an](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=44.54) [artifact ID of hibernate‑validator, and a version of 6.1.1.Final.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=49) [When you first add this in here and save it,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=56.33) [it is going to take it a minute to download.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=58.54) [So if you get a red error for a minute,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=61.38) [realize it just has to resolve that dependency and](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=63.55) [download it to your local repository.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=65.75) [Once you've saved that, though, just as we've done with other dependencies,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=68.2) [you should be able to look in your external libraries and look for](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=72.09) [org‑hibernator, and specifically the hibernate‑validator,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=77.14) [and you can see that it's downloaded there.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=81.78) [We've got it in our window pane on the left,](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=84.34) [and it's specifically version 6.1.1.Final. Let's go back and see how we start using this now.](https://app.pluralsight.com/course-player?clipId=494db367-2de5-4721-99c7-9bb6cbb621ed&startTime=86.66)

### [Demo: Validation](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7)

[Validation in our project requires us using the](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=1.04) [@Valid annotation before our model,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=4.46) [essentially saying that we want this model object to](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=7.94) [be valid upon entering this method.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=10.83) [In the method signature, you can see where we have annotated this using @Valid.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=13.54) [The other thing to note though is the reference passed in of the BindingResult.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=19.85) [It contains any errors and a flag to notify you that there was a](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=24.43) [verification error so we can direct that to the correct view.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=29.35) [From here, we can direct back to the appropriate page,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=33.74) [in this case the form which it would have been submitted from.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=36.6) [Inside our form element,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=39.73) [we can add a form:errors tag that will only show when an error is present.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=41.18) [So we're going to change the controller signature in our controller,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=46.67) [and we can add an errors element inside of our JSP page,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=52.38) [all by adding specific attributes on our model object.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=57.65) [Let's implement this in our current project and see how this works out for us.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=61.84) [To begin adding validation,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=67.54) [we first want to start off with which object we want validate.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=69.06) [I'm going to open up our model, Registration class,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=72.79) [and let's make it to where we don't enter in a name that's just empty.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=76.94) [So I want to go above that member variable and say @NotEmpty.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=81.84) [And this will guarantee that when we ask for validation on it,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=88.14) [it doesn't allow an empty or blank or spaces.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=91.64) [There's a lot of characteristics around it that you can look up,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=96.65) [and there's different options we could use,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=99.95) [but we'll just signify @NotEmpty for now.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=101.51) [The next thing we want to do is open up our RegistrationController,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=104.57) [and there's a couple of changes we need to make inside of here,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=109.54) [but they're still quite minor.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=112.08) [As we mentioned on the previous slide,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=114.1) [we want to add Valid to that method signature,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=116.41) [saying that this model attribute we want to be valid.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=122.46) [And since it is a registration object,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=125.6) [that NotEmpty that we put in there automatically signifies that we want](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=130.26) [it to be a valid registration object when validated.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=133.93) [The next thing we want to do is add a binding result to this. So we're](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=140.38) [going to say BindingResult and give that a name of result.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=146.4) [And you can see in here that it just goes through the method](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=155.14) [signature passed by reference to grab any errors that we have](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=159.85) [in here and display them for us.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=164.21) [Now if we have an error,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=166.27) [we can easily check for it and change our navigation based off of it by](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=168.71) [saying if result.hasErrors, go here instead. So we can return back to](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=172.35) [the registration form without doing the post redirect get that we had](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=181.05) [set up down below. And just to show you this is working the way that we](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=187.24) [think it should, let's add a system.out.println in here just to show](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=190.71) [you that there are some errors that we're going to return from this.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=196.79) [There were errors. And we'll save this. And this is](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=201.64) [actually all we have to do for our code.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=209.68) [Now to display those errors,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=211.97) [we want to add some functionality to our JSP page,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=213.79) [but this will validate our object, and we can handle it from there.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=217.44) [We've got all that functionality built into it now. Let's](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=222.3) [open up our JSP page and customize that page to show](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=226.75) [those errors back to the user.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=231.03) [I want to start off by adding in a little bit of CSS. And yes,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=235.14) [in your project, you'll probably have a CSS file that contains all this.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=239.55) [But just for the sake of this example,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=243.87) [we're going to add it at the top of this page.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=245.33) [I want to go below title,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=248.57) [but still within the head tag. I'm going to add this style element and](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=250.05) [inside of there two classes, an error and an errorblock. And then I want to](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=254.33) [go below the form tag that we created earlier,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=259.22) [and we're going to do another form tag,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=264.58) [but this time going to do form:errors, and the path on this and the](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=266.45) [CSS class is errorblock, and the element is div.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=274.08) [We can close that off and save it.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=284.28) [So we've added our error code, what it's going to look like, and](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=287.41) [then the block to actually display that to the page. Let's exit](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=290.89) [full screen now and start our server up,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=295.14) [and now we can go to our registration link.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=297.68) [When I click on it, it'll pull the page up.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=301.18) [If I enter a name in here, it would go through cleanly. But without it,](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=304.08) [let's just see what we get.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=309.9) [We get our error message back saying it must not be empty.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=311.11) [Notice that this is the default message.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=314.11) [It's all lowercase.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=316.05) [It is my simple HTML just displaying this red error block.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=317.78) [But we can customize this message.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=322.24) [Let's make sure it still works if we enter in a name though. I'll add in](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=324.17) [Bryan in here and hit Add Registration, and it works.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=327.64) [We've got our post redirect get still working, and we have](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=333.24) [our error message still working, so great.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=337.51) [Let's customize that a little bit so that we've got a little bit more user friendly error message in there.](https://app.pluralsight.com/course-player?clipId=f0d330f3-d707-47d5-9a29-e9e6dc141ca7&startTime=339.8)

### [Custom Error Messages](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a)

[Those last error messages were a little bit generic and](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=0.99) [didn't really fit our application very good.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=4.46) [Let's customize that a little bit.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=7.1) [Let's start off by going into our JSP page and adding](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=9.09) [a field‑specific validation error.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=14.19) [So I'm going to add another td in here and a form:errors path="name",](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=17.99) [and that's referring to the element or the variable inside](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=23.84) [of our registration object called name, and a CSS class of error,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=28.71) [that's the CSS class we defined up above.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=33.62) [I need to change this table to be three columns now because we](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=36.34) [have now added that third column on there.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=40.54) [And let's save this.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=43.03) [Now all this is going to do is just going to display the](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=44.28) [error message that we're returning.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=46.29) [It's the same error message that we already have in our class Registration.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=47.58) [Registration, if you remember on line 7 here, is just saying not empty.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=52) [But how do we customize that error?](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=58.24) [Well, it's actually really cool.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=60.23) [So I'm going to create another comment in here and just say validations,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=62.36) [and from here I'm going to take the type of validation that we're doing,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=68.69) [which is a not empty on line 7.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=72.45) [I'm going to say NotEmpty., and it goes to the actual instance name.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=76.34) [So we are commonly referring to this as Registration.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=84.3) [If you look at our controller,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=88.3) [we're returning an instance of the registration object](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=90.07) [under the ModelAttribute registration.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=93.06) [So we want to go back to our message.properties and say](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=95.27) [registration.name. So NotEmpty on the registration object on the](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=99.68) [member variable name=Name can not be empty, please fix.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=108.38) [You can obviously name it whatever you want.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=120.44) [And if you're going to do this in Spanish,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=122.74) [you'll want to do the same thing in that message's properties as well.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=125.44) [It'll work if we just stay in English.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=129.5) [But just so you don't forget, I'm just going to change this to say in Spanish.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=131.5) [You can do the translation later.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=136.72) [That's all we had to do though. Our messages.properties,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=140.04) [you do the validation that you're trying to achieve, the name of that](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=142.76) [instance, and the variable instance that you're trying to tie that to, so](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=147.57) [it does it all off of a name value‑key pair, the actual string that we](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=152.76) [want to fix, and now we can run it.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=157.61) [So let's restart our server here. Now when we go into our registration,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=160.64) [we can click on it.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=166.17) [If it's not there, now we have Name can not be empty, please fix.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=167.94) [So it will show you the specific error, and we showed it at the](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=172.67) [whole page level and the individual field level.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=175.99) [You can play with that and add validations to all the fields you](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=178.71) [have in there and do it in a programmatic fashion. It works really](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=182.37) [well, and this is all internationalized.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=185.85) [So we've internationalized our application. We've](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=187.9) [internationalized our error messages.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=190.46) [Everything is working, and the validation is really easy to do.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=192.74) [So you can see how this is a really handy way for you to validate stuff.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=196.62) [By the way, this bean validation just doesn't work for UI.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=200.65) [You can use this anywhere in your application.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=203.65) [I see a lot of people do programmatic things where they go](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=207.27) [try and apply this validation on their own.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=210.11) [You can use the validation utils inside of that bean](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=212.72) [validator to run that across your object,](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=216.35) [so there's no reason for you to code it yourself.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=218.96) [You can pass an object in and ask if it's valid and have that return. That's all Spring's doing behind the scenes. Works really well.](https://app.pluralsight.com/course-player?clipId=7e92303b-508c-4202-8219-e6106850127a&startTime=221.08)

### [Summary](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93)

[This module covered Bean Validation,](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=1.11) [which I think is one of the coolest, yet underutilized](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=3.3) [features inside of any of the UI tools I've seen.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=7.28) [We looked at and learned the history of 303, 349, and 380, which](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=10.9) [it's just adapted and grown with the JVM releases.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=16.79) [We talked about the validation interface, and it's still a viable option.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=20.54) [I chose to not show it because I don't think you should be](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=25.65) [using it, but I want you to know that it's out there, and I](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=28.73) [want you to know why we addressed it.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=32.01) [I don't think you should use it.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=34) [It often gets too much business logic inside of those classes and](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=35.44) [those implementations that you do. We showed you how to add the](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=40.96) [dependency for the JSR, and we specifically used 380 and that it is](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=44.28) [an instance of Hibernate Validator,](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=49.04) [which often catches people off guard because they](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=51.28) [think they're dealing with the ORM,](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=53.43) [which they're not. It's just the Bean Validation implementation.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=54.93) [Then we showed the configuration and actually showed a more advanced](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=59.51) [version of it where we customize the error messages. Let's go ahead and dive into some RESTful services using Spring MVC now.](https://app.pluralsight.com/course-player?clipId=34944cc3-8955-45ef-9d2b-491a74f7fe93&startTime=62.8)

## [Using Client-side JavaScript in Spring MVC Applications](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a)

### [Introduction](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a)

[JavaScript frameworks like Angular, React,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=0.94) [Vue, etc are changing faster than ever.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=4.34) [Although a simple example with Angular would be nice,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=7.91) [it would be out of date faster than we could publish this course.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=11) [What has been very consistent though is jQuery.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=14.32) [Before we dive into JavaScript though,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=18.05) [let's look at the Spring configuration we need to](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=20.34) [serve up some RESTful services.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=22.56) [Specifically, let's look at RestControllers.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=24.64) [The RestController annotation is the heart of serving up RESTful](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=27.87) [services. Looking at it though, it looks very similar to other](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=32.07) [controllers that we've already created.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=35.98) [In fact,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=38.29) [we use the same annotation for the GetMapping that](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=39.09) [we'd do in a standard controller.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=42.5) [In this particular example,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=45.24) [we're going to call the User URL and get back either a default or](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=46.78) [pass in the name that we would like to retrieve.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=52.06) [Obviously in a larger example,](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=55.04) [we would pass in a name and retrieve the user from a database. Let's add this RestController to our project now to retrieve a user.](https://app.pluralsight.com/course-player?clipId=70a9dbeb-6a42-4295-a43e-d129d382309a&startTime=57.14)

### [Demo: @RestController](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b)

[To begin adding that RestController,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=1.04) [let's first start by giving us a model object to return off of our request.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=3) [I want to go ahead and open up our src, main,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=8.54) [java, com.pluralsight.conference package.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=11.68) [And go to the model, and right‑click on the model, and say New, Java Class.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=14.64) [And inside of here, I want to just do a User Class.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=20.94) [Let's hit Enter.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=25.44) [Now we give it a couple of member variables.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=28.29) [I'm going to do private String firstname,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=31.16) [private String lastname, and a private int age.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=37.14) [Now let's give ourselves some whitespace and right‑click and say Generate.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=49.51) [We want to do the Getters and Setters. Select all three and say OK.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=55.42) [Let's save this.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=61.24) [Now we've got a model object we can pass back and forth with our controller.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=63.1) [Let's right‑click on our controller and say New, Java Class.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=69.04) [We'll call this UserController.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=74.42) [I want to start off by saying @RestController.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=79.44) [And what this does is it makes sure that every call that goes in](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=84.34) [and out of here looks at the content type and the except headers](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=89.04) [to see how and what it should return.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=93.59) [And to save yourself the typing, you can go ahead and open up that](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=96.84) [RegistrationController and copy that if you want,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=101.45) [or we can code it in by hand.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=104.38) [I'm actually going to paste a Get in here and change a few things.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=107.44) [First, I'm going to start by importing the classes that we need,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=115.54) [and the User object specifically wants us to select that](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=120.74) [particular one, and our request parameters.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=127.08) [Now we have all the pieces we need inside of here, and let's](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=133.93) [walk through what this example's doing.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=136.55) [The return type of this method getUser is our user object type.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=139.91) [Now, in the previous examples we were doing with our registration controller,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=144.99) [you can see here on line 16, we were returning a string.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=149.16) [Let me expand that code so you can see it.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=155.59) [On line 17, we were returning the actual string registration,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=157.91) [which referred to our GSP page with our InternalResourceViewResolver.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=162.96) [Well, we don't do that with a RestController. We](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=168.04) [return the actual body to our caller.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=170.3) [So we're going to have a request come in, and the response is](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=174.89) [going to be the actual body of the response.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=178.56) [Now there's a couple other things in here. You'll notice that](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=182.05) [we have a @RequestParam that will pull those parameters off](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=184.41) [the URL as we make requests to it.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=188.18) [And right now I just have one of them.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=191.24) [We can add the other ones in here and say @RequestParam,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=193.02) [lastname, and we can grab the age if we want as well.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=200.84) [Now we can set those values in our actual objects.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=208.34) [We'll say user.setLastname and user.setAge and save this.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=211.94) [We have all the pieces we need for this to now return that body back](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=227.15) [containing the user object that we've created.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=232.27) [Now obviously,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=234.93) [we usually wouldn't be just taking parameters that come in and](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=235.68) [storing them in an object and returning them.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=240.8) [This is where we would have a service auto‑injected into our](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=243.34) [business logic tier or our model that would go ahead and](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=247.3) [retrieve this out of a database.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=251.21) [So lines 15, 17, 18, 19,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=252.77) [all of this would be a database call to our model tier](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=256.82) [returning something from a repository.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=259.64) [But for this example,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=261.84) [it shows you how we're grabbing those request parameters and storing](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=262.83) [them in an object and returning them back out to you.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=266.88) [Let's save this.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=269.78) [Going to start my server up. And now, we don't have a page set up for this.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=272.74) [We're just going to request that actual instance back.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=280.95) [So we can say user and hit Enter,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=284.78) [and you'll see we get JSON text back, and there are](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=289.5) [defaults that are already in there for us.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=293.68) [But we can override that with query parameters,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=296.76) [so we can say firstname is equal to Dan.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=299.18) [And when we run that, it will return that as Dan.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=309.52) [You can do others out there. We'll say lastname equals to Frandson.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=313.31) [And we can override the age while we're at it.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=329.21) [Just standard query parameters.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=331.74) [We'll say age equals 33.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=334.81) [Notice that it handled the strings appropriately,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=340.71) [the integer appropriately. We are reading in those query params,](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=344.68) [storing it in the object, and returned it without us](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=349.02) [having to use any view resolvers.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=351.59) [So it goes ahead and just by default accepts that JSON response back and returns it to you as a client.](https://app.pluralsight.com/course-player?clipId=49d45c63-4ef7-4a69-92e0-58f4f830ab2b&startTime=353.23)

### [Postman](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048)

[Obviously, our browser worked fine to do a simple test to grab that URL and](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=1.04) [see that the values were changing, but I wanted to show you Postman. I've](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=7.41) [just downloaded their basic version for free.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=11.53) [I don't have the paid version of it,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=14.9) [but it's a great tool for testing web services,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=17.41) [and you can see that it'll actually store history of it.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=19.81) [You can create a test suite out of here if you'd like.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=22.54) [But to run a simple test in here,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=25.39) [we can go ahead and enter our URL,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=27.12) [localhost:8080/conference/user, and this is of type GET.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=28.47) [I can Send on this, and you'll see that it retrieves](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=35.47) [the firstname Bryan, lastname Hansen, age 43 in here. Works great.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=38.96) [We can also do posts in here.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=45.14) [So if we come in here and set a POST and create the Body,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=47.69) [we can add in these key valued pairs inside of here saying that I want to](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=51.54) [pass in a key of firstname and a value of Bryan, a key of lastname and a](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=55.87) [value of Hansen, and a key of age and a value of 43, and it will handle all](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=60.8) [of the quotes, and strings, and manipulation, and converting it to integer](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=66.18) [objects for us automatically.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=70.98) [If I call this right now, it's going to fail,](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=72.89) [though, and give us an error back because we haven't created this method yet.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=74.95) [So let me hit Send on this, and you'll see we get a 405 error saying that](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=78.31) [the request method, POST, is not currently supported. Let's add that into our code now.](https://app.pluralsight.com/course-player?clipId=c776e1e0-f40b-413c-ab6b-f1ed31aa2048&startTime=82.49)

### [Demo: @PostMapping](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d)

[Adding support for the POST was almost easier than doing the Git.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=1.04) [We just need to come into our controller and below our Git mapping,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=4.31) [but before our closing curly brace,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=8.46) [you want to add a PostMapping, and inside of here we want to have it handled](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=11.42) [the same way with the /user request, and then we want to just start putting our](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=17.69) [signature in here. So we're going to say public, and it's going to take an](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=26.32) [object type of User, and we'll name it user.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=33.68) [Instead of our method,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=39.01) [we can return our user instance. We can manipulate things on](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=41.14) [there if we want, but for just some debugging, let's add a](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=46.1) [System.out.println here on User firstname,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=50.24) [getFirstname and save this.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=66.64) [Now, we have everything in here to actually handle a POST.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=69.31) [Now, from the previous module,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=72.84) [you could go ahead and add validation in here and other stuff to handle that.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=74.9) [We've already seen those pieces in action.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=80.24) [We don't need to make this example more convoluted,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=82.24) [but those same binding results and valid attributes will still work](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=84.96) [inside of RESTful services. Let's restart our server, and I'm going](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=89.66) [to go over the Postman. Now in Postman,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=97.78) [with this POST set up where I've just chose the type of POST and clicked on](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=100.48) [the Body tab, added in my elements, my key of first name, value of last](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=106.74) [name, key of last name, value of Hansen, age, all of the name value](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=111.58) [key‑pairs inside of here, if I click Send,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=117.09) [you'll notice that it returned our object back to us,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=121.34) [and that's because it successfully went through that. Let me switch back over](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=124.72) [to the IDE, and you'll be able to see that System.out.println in our console.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=128.03) [You can see our user first name Bryan at the bottom of our console output](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=131.36) [because we went clear through that life cycle.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=136.39) [That's really all we had to do to add a GET and a POST to our code.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=138.85) [You can easily implement the other methods as well.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=146.44) [A PUT and a DELETE, they have the same URL mappings, you](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=149.3) [can go ahead and put them in here,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=153.06) [and it will accept the except headers that you send in.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=154.37) [So if it's a PUT, POST, GET, or DELETE,](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=158.75) [it will handle it accordingly to that request. Makes it really easy.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=161.37) [Let's see how we'd do this and now intercept this data with jQuery on the client‑side.](https://app.pluralsight.com/course-player?clipId=b5bb6e72-47bd-4708-a398-bfd644756f0d&startTime=166.2)

### [Demo: jQuery Integration](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1)

[As we mentioned before,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=1.04) [JQuery has stayed pretty tried and true for accessing data,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=3) [especially for some RESTful services.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=6.59) [You can see in this example here we're going against a URL.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=8.99) [It's the URL we actually just created for localhost:8080/conference/user.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=12.67) [And then we can grab the body, the data,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=17.7) [and grab the first name out of that and append that into our document last](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=20.34) [name and age and manipulate the data in our DOM with that.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=26.62) [Let's go ahead and add some JQuery into our project now.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=31.45) [It's pretty simple.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=34.3) [We're going to add a little JQuery snippet and then add a user.html page that](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=35.29) [just uses JavaScript to interact with our RESTful service.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=41.91) [To start let's add that user.js file inside of our static directory.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=46.27) [So I'm going to right‑click on src, main,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=52.64) [resources, static here and say New, File,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=55.01) [and I'll just do user.js and hit Enter.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=60.19) [Then I'm going to right‑click on static again and create another file,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=66.1) [user.html.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=71.72) [And these two files are just going to have some simple](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=76.04) [HTML and some simple JavaScript.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=78.61) [In fact, it was the exact JavaScript we just showed on the previous slide,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=80.64) [to access our URL.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=84.31) [I'm going to paste in this JavaScript.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=87.97) [I'll make it full screen so that you can see it.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=91.69) [It's a little bit of coding.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=94.34) [If you want,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=95.83) [you can grab these out of the examples and just paste it in yourself.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=96.41) [It's underneath the course, main directory,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=99.85) [and there's an exercise files link in there that you can](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=104.39) [grab that information and just paste it in.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=107.06) [And I'm going to do the same thing for the HTML.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=110.03) [And there are a couple things to note in here.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=114.94) [The script is using a CDN, or a Content Delivery Network,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=118.56) [to pull in our JavaScript on line 5.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=121.76) [And then we're referencing that script that we just created on line 6.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=124.45) [And we have a couple of elements down here,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=128.55) [firstname, lastname, and age,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=132.75) [that are being referenced in our JavaScript file over here.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=135.01) [So when we grab that data,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=139.93) [we go ahead and manipulate those elements with that data from firstname,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=141.28) [lastname, age on this request.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=145.96) [So when the page loads, it calls this AJAX function when the page is ready,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=149.59) [and then it takes the results of that and appends them](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=153.54) [into those elements in our HTML page.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=156.51) [Let's start our server up.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=160.89) [And we haven't created our helpful little link in here.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=162.79) [We should,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=166.04) [but all we have to do is go up to our URL and type in user.html and hit Enter.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=166.6) [And you'll notice it pulled back Bryan, Hansen, and age 43.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=174.27) [So it went out, did our request from a REST controller,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=179.54) [and pulled that information back in.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=183.76) [Really easy to do.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=186.06) [You can see how valuable these RESTful services are,](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=187.47) [and we're not using anything like JSP pages in this example or Thymeleaf.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=190.44) [We're just going out and pulling these RESTful services](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=195.97) [into our app using simple JavaScript, just JQuery.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=199.63) [I don't even have to have anything as advanced as Angular or React or Vue.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=203.37) [It's a simple AJAX call.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=207.06) [Very powerful and a great way to access data and have this inside of your just basic HTML.](https://app.pluralsight.com/course-player?clipId=a97cec6b-32d3-44d1-8185-0241e50371f1&startTime=208.63)

### [Summary](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744)

[This module was all about Ajax, Ajax calls,](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=1.04) [pulling back, RESTful services from our server.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=4.9) [We did this implementing a RESTController.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=9.54) [We showed you how to do the GET and the POST,](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=12.14) [and honestly, the PUT and the DELETE are identical.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=14.5) [It's really no different,](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=17.38) [so there's not a lot of sense in going through those exercises.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=18.44) [We then showed you a quick example using Postman and how](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=21.94) [powerful it can be to use that to not only GET but have canned](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=25.11) [examples of POSTs back to the server.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=30.05) [It's a great way for you to test your web services and](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=32.03) [run through that pretty quickly.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=35.23) [And then we did a final example using JQuery and showed you exactly how](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=37.34) [easy it was to use an Ajax call in your HTML to pull back that JSON data](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=42.51) [from your URL. And this is the end of this course.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=48.35) [I want to thank you for staying with us this long and completing everything.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=53.02) [I would recommend looking at some of the continuation courses after this. I](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=57.13) [have a Spring Data JPA with Hibernate course, Spring Security, I have other](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=62.36) [courses on RESTful services, and a great series on design patterns that,](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=67.99) [regardless of using Spring, if you're doing any type of Java development,](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=72.19) [I would recommend you look into those. Thank you, and I appreciate you sticking with us.](https://app.pluralsight.com/course-player?clipId=afc3c447-6af2-4ede-ad74-b3ba46029744&startTime=76.06)