## [Course Overview](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd)

### [Course Overview](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd)

[Hi everyone.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=0.5) [My name's Dustin Schultz, and welcome to my course Spring Cloud Fundamentals.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=2.1363636363636367) [I've been developing software day in and day out for almost 12 years,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=10.700000000000001) [and right now is without a doubt one of the best times](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=15.500000000000004) [there is to be a software engineer.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=19.699999999999996) [The cloud, or cloud computing, is truly changing the way we,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=22.5) [as developers, think about design and develop software.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=26.5) [And that's where Spring Cloud comes in.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=30.5) [Spring Cloud helps you take full advantage of these new paradigms by](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=32.833333333333336) [bringing together the best of Spring Boot with proven cloud strategies to](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=36.83333333333335) [help you design and develop cloud-native applications.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=41.68181818181817) [Some of the major topics we'll cover include service](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=44.83333333333333) [discovery using Spring Cloud and Netflix Eureka,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=49) [distributed configuration using Spring Cloud Config Server,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=52.5) [client-side load balancing using Spring Cloud and Netflix Ribbon,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=56.5) [intelligent routing via a gateway service using Spring Cloud and Netflix Zuul,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=60.5) [and fault tolerance using Spring Cloud and Netflix Hystrix.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=65.5909090909091) [By the end of this course,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=70.5) [you'll know how to build applications that take full advantage of the cloud.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=71.88461538461536) [Before beginning the course, you should be familiar with Java,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=75.90000000000003) [Spring Boot,](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=79.34615384615384) [and have at least an introductory level understanding of microservices.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=79.96153846153845) [I hope you'll join me on this journey to learn Spring Cloud with the Spring Cloud Fundamentals course at Pluralsight.](https://app.pluralsight.com/course-player?clipId=14b5170a-a6b3-4d44-a7e4-aa3f6af4b8dd&startTime=84.5)

## [Getting Familiar with Spring Cloud](https://app.pluralsight.com/course-player?clipId=99e57b7a-751d-477a-9df0-ba131c12404c)

### [Version Check](https://app.pluralsight.com/course-player?clipId=99e57b7a-751d-477a-9df0-ba131c12404c)

### [The Infamous Cloud](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7)

[Hi, and welcome to the course Spring Cloud Fundamentals.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=0) [My name's Dustin Schultz, and before we begin,](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=5) [let's get a little bit more familiar with what Spring Cloud is.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=7.46153846153846) [I'm sure you've heard of this infamous thing called the](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=13) [cloud as it's often hyped as this game changer or the sort](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=16.076923076923084) [of magical solution to everything.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=21.5) [It'll solve all your problems.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=24) [And with so many things to learn these days,](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=25.15384615384615) [it's hard not to ignore a lot of that and just kind of](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=27.25) [brush it off as clever marketing.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=30.5) [But now companies and enterprises are finally](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=32.599999999999994) [starting to truly embrace the cloud,](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=35.38461538461539) [and some of that hype is actually becoming a reality.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=37.69230769230771) [And it's more often the norm to see enterprises and companies](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=41.66666666666666) [using the cloud than it is the exception.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=46.36363636363636) [As software engineers, I think we have some really exciting times ahead of us.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=50) [Cloud computing, or the cloud, is really changing the way that we build software.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=54.24999999999999) [We're moving from using these centralized monoliths to](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=60.272727272727266) [applications which are distributed and use microservices.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=64.33333333333333) [And not only is the software changing, but the hardware is changing as well.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=69) [We're moving from this managed and finite resource to this infinite and on demand and self-service resource.](https://app.pluralsight.com/course-player?clipId=0e03f518-a3a4-4c65-9006-9378137b8de7&startTime=74)

### [New Challenges with the Cloud](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c)

[With the cloud, there comes these new challenges.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=2.1) [We have to think differently.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=5.1) [Things are not quite as static as we're used to,](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=6.638461538461537) [and we can't just design and architect and use the same](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=9.86923076923077) [principles or techniques that we're used to.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=14.1) [The cloud is this elastic and ephemeral thing.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=17.1) [Things can grow and shrink and appear and disappear at any given time.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=21.1) [So we have to consider that the cloud is this](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=26.1) [ever-changing and constantly evolving thing,](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=30.26666666666668) [whereas we may be used to something that is a bit more static.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=32.1) [We also can't just move our existing applications to the cloud and](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=37.1) [expect them to be automatically cloud enabled.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=41.1) [This is often referred to as the lift and shift migration.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=44.1) [And sure we're going to get some benefits by moving to the cloud,](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=49.1) [but we're not fully utilizing the cloud.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=52.1) [In order to fully utilize the cloud, it requires change.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=55.1) [And that's where Spring Cloud helps.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=60.1) [Spring Cloud helps you build cloud-native applications.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=61.73636363636364) [Now, you're probably asking what is a cloud-native application?](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=64.21111111111111) [Well,](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=70.1) [a cloud-native application means that your application was](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=71.1) [specifically built and engineered for the cloud.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=75.1) [It means your application fully utilizes all of the cloud computing paradigms.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=78.1) [Spring Cloud itself is not actually a framework.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=85.1) [Loosely speaking,](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=89.1) [Spring Cloud is used to describe a number of projects](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=89.82727272727271) [that all fall under the same umbrella.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=93.6) [In this course, we'll focus on the fundamentals, which is Spring Cloud Config and Spring Cloud Netflix.](https://app.pluralsight.com/course-player?clipId=d526d3ee-ee96-4924-a9d3-ab3bc6698f8c&startTime=97.1)

### [Your Focus for the Course](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b)

[We're going to specifically target a number of key areas.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=1.661) [First, we're going to look at service discovery.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=5.661) [How do you dynamically find your application services in the cloud at runtime?](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=7.661) [Then, we'll move on to distributed configuration,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=14.661) [or how to manage common or service-specific](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=17.206454545454545) [configuration in a distributed system.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=20.536) [Then, we'll look at intelligent routing,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=23.661) [or how to make a distributed system look as if it were a single](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=26.16100000000001) [cohesive system using Intelligent Routing.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=32.96869230769232) [Then, we'll look at client-side load balancing,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=35.661) [or how you distribute load among several instances of the same service.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=38.20645454545457) [And last,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=44.661) [we'll look at how you can use the circuit breaker pattern to](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=45.23242857142857) [build fault-tolerant applications in the cloud.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=48.661) [Before we go any further,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=52.661) [it'll be helpful to open up a new browser window or](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=54.089571428571425) [tab and visit my website at dustin.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=58.29736363636364) [schultz.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=64.02463636363638) [io/ps-scf.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=64.84281818181819) [That's Pluralsight Spring Cloud Fundamentals.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=65.661) [And here you're going to find all of the frequently asked questions,](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=68.661) [easily clickable links for any additional resources, and any course updates.](https://app.pluralsight.com/course-player?clipId=45f4f4e2-f66f-4679-874f-28e74951849b&startTime=71.661)

### [Prerequisites](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323)

[Let's talk prerequisites.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=1.894) [I assume that you have a good understanding of Java and particularly Java 8,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=3.894) [as well as a good understanding of Spring Boot as Spring](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=9.608285714285715) [Cloud is largely built on top of Spring Boot.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=13.53685714285715) [If you need a refresher on Spring Boot,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=16.894) [there are a couple of excellent courses already on Pluralsight.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=18.740153846153838) [The first, Creating Your First Spring Boot Application by Dan Bunker,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=22.036857142857134) [and the second, my other course, Spring Boot: Efficient Development,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=25.894) [Configuration, and Deployment.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=29.894) [Last,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=31.894) [I expect that you have at least a knowledge or an understanding of](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=32.278615384615385) [microservices or service-oriented architectures.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=37.693999999999996) [Next,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=40.894) [let's talk about what software you're going to need](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=41.144) [to be successful in this course.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=43.394) [Of course you're going to need Java, Java 8,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=44.98490909090909) [and you'll need Maven, at least Maven 3,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=47.56066666666667) [in order to build the Spring Boot applications.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=50.227333333333355) [And we're going to be doing all of our development using Spring Tool Suite,](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=52.644) [or Eclipse STS, as it's called.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=57.166727272727265) [Make sure you have at least version 3. 8.](https://app.pluralsight.com/course-player?clipId=4f5cc128-f0e6-4966-96bb-611be6fa0323&startTime=59.894)

## [Finding Services Using Service Discovery](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd)

### [What Is Service Discovery?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd)

[Hi, I'm Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=0) [and in this module we'll look at how service discovery helps you](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=1.8461538461538463) [locate your application services in the cloud.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=7.799999999999999) [Let's quickly start off by talking about what this module contains,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=12) [and first we're going to look at service discovery.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=16) [Obviously this module's about service discovery,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=19) [so we'll talk about what it is and why it's important.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=20.800000000000004) [Then, we're going to look at how Spring Cloud implements service discovery.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=23.999999999999993) [It uses a project from Netflix that was open sourced,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=28) [it's called Eureka,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=33) [and we're going to talk about the Eureka Client and the Eureka Server.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=33.75) [Then, we'll move on to configuration, configuring the Eureka Client,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=37.599999999999994) [the Eureka Server,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=41.599999999999994) [and the Eureka Instance and how each of those are different and what you](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=42.79999999999999) [need to do to tweak them or configure them for your needs.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=47.14285714285713) [Then, we'll move into health and high availability.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=51) [How does the Eureka Server know when your application](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=54) [is down or when it's unhealthy?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=57.59999999999999) [And how do you ensure that the Eureka Server is highly available?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=60) [And then we're going to look at the Eureka Dashboard,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=65) [which is a nice web UI that shows you all of your registered services,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=67.14285714285708) [how many instances there are, and whether they're up or down.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=72) [And last, we're going to finish out with how Eureka has specific support for AWS.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=76) [Let's get started with the most important question,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=82) [what is service discovery and why do we need it?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=84.18181818181813) [Remember that the cloud is changing the way that we build software.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=88) [We're moving from building these single large applications and instead](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=92) [breaking them up into smaller and smaller pieces called services.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=96) [And each of those individual services can then be](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=101) [deployed and scaled on their own, and together,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=103.99999999999996) [as a whole, they form the overall application.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=107.30769230769234) [And herein lies the problem.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=111) [How does one service know where another service is at,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=112.66666666666664) [its host and its port, so that it can call it and use it?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=115.88235294117648) [For starters,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=120) [we could simply configure all of our services to know the location](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=120.83333333333334) [and the port of other services that it calls.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=125.72727272727272) [And, depending on our needs, this actually might get us pretty far.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=129) [But after a while, we'll learn that there are some problems to this approach.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=133) [What if, for example, you had two instances of a particular service?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=138) [So, in our example here,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=142) [we have Application Service A calling Application Service B.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=143.81818181818187) [And if we used configuration,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=147.3636363636364) [every time we added or removed a new instance of Application Service B,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=149.63636363636374) [we'd have to update that configuration.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=154.84615384615387) [And, well, in our example, we only have two instances.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=157.38461538461536) [Imagine if you had hundreds of instances.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=162) [The configuration management alone would be unsustainable.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=165) [Our simple configuration starts to break down even](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=169) [further as we move to a cloud environment.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=171.66666666666674) [In a cloud environment,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=174.66666666666663) [you have instances of services that can come and go in response to demand,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=176.33333333333326) [for instance.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=182.16666666666657) [So, for example, Application Service B starts with two instances,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=183) [and consider that maybe you have this huge influx of traffic,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=188) [maybe it's a flash sale on your eCommerce website,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=192) [and an automated process kicks off and starts two more](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=195.00000000000009) [instances to handle all of that demand.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=198.99999999999991) [Well, if you're using simple configuration,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=202) [all of the callers of Application Service B,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=204.7272727272728) [such as Application Service A,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=208.09090909090912) [would not even know about the two new instances that](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=209.909090909091) [were added in response to that demand.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=212.99999999999994) [As far as they're concerned,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=215) [their configuration says that there are only two instances that they know about.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=216.3636363636364) [Another thing to consider is that application services will eventually fail.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=221) [And regardless of the situation,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=227) [whether it's a memory problem or a hardware problem,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=228.6666666666667) [if you're using simple configuration,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=232.14285714285717) [your services are going to continue to try to send](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=235) [traffic to those failed instances.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=239.00000000000006) [For example here,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=241) [we have Application Service B being called by Application Service A,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=242.09090909090912) [and it has two instances.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=246.5) [And if one of those instances fails,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=249) [Application Service A is not going to know the better,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=251.3333333333334) [and it's going to continue to send traffic to that failed instance.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=254.15384615384613) [We need something that is more dynamic.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=258) [The simple approach is just far too static.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=260.9166666666668) [It's too frozen in time for our needs in the cloud.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=264.0714285714285) [That's where service discovery comes into play.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=268) [Service discovery typically provides the following types of functionality.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=271) [A way for a service to register itself.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=275) [And what that means is that when a service comes online it can call out to the](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=277.85714285714266) [Service Discovery Server and let it know the location and port of its service](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=284.23076923076894) [so that other application services can call it.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=289.285714285714) [For the exact opposite reasons,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=292.39999999999986) [service discovery provides a way for a service to deregister itself.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=294.5) [So if a service were to shut down or go away temporarily for upgrades,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=300) [it would want to let the Service Discovery Server know that](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=305) [it's no longer available for clients to use.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=308.38461538461553) [And, most importantly,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=311.66666666666674) [service discovery provides a way for clients to find other services.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=313) [And what do I mean by clients?](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=318) [Well I mean other application services.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=320.6923076923075) [So if you're an application service that needs to use another service,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=323) [you need to be able to find the location and port of that service,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=328) [and you can ask the Service Discovery Server for that information.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=332) [Lastly,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=336) [service discovery provides a way to check the health of a](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=336.3333333333333) [service and remove any unhealthy instances.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=340) [So each application service would implement a health check,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=344) [typically via a REST endpoint,](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=347) [and then the Service Discovery Server would call that endpoint.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=349.2727272727272) [And if the health check were to fail, it would remove that instance from its registry.](https://app.pluralsight.com/course-player?clipId=7fb39b91-ee04-4527-bdb1-714ff15367cd&startTime=353.33333333333326)

### [Introducing Spring Cloud Netflix](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce)

[Now that we have a good understanding of what service](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=1.4) [discovery is and why it's important,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=4.476923076923075) [let's learn how Spring Cloud helps us implement it.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=6.3999999999999995) [There are actually several different ways that you can](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=9.4) [discover services using Spring Cloud.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=12.100000000000007) [There's the Spring Cloud Consul project,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=14.4) [there's the Spring Cloud Zookeeper project,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=17.4) [and there's the Spring Cloud Netflix project.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=19.79999999999999) [We're going to specifically focus on the last one,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=22.49090909090909) [the Spring Cloud Netflix project.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=26.066666666666666) [The folks over at Netflix have some serious experience](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=29.4) [building scalable applications in the cloud.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=32.1) [And, in fact,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=34.21818181818183) [you could probably even argue they have some of the largest](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=35.30909090909093) [scalability problems you can imagine.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=38.86153846153845) [And they built some projects internally to handle these problems and](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=40.4) [eventually released them as open source projects.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=45.4) [The Spring Cloud project took the Netflix open source projects and](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=48.4) [added some Spring and some Spring Boot features.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=52.4) [They sort of Spring-a-fide it, if you will.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=56.4) [And what was born out of that was the Spring Cloud Netflix project.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=58.4) [Similar to the Spring Cloud project,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=63.4) [the Spring Cloud Netflix project is not actually a project in and of itself.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=65.58181818181816) [Rather, it's a collection of projects.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=71.4) [And for service discovery,](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=73.80000000000004) [we're interested in two of those projects: the Spring Cloud Netflix Eureka Server and the Spring Cloud Netflix Eureka Client.](https://app.pluralsight.com/course-player?clipId=b0a3b2b7-f86b-46a9-a815-7740a95b67ce&startTime=75.4)

### [Key Components Involved in Service Discovery](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad)

[Before we dive in to the Spring Cloud Eureka Server and Client,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=2.277) [it's helpful to understand the key components that are involved in](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=6.277) [service discovery and how they interact with each other.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=9.277) [At a minimum, there are three components involved in service discovery.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=13.277) [There's the Discovery Server, the application service,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=17.277) [and the application client.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=21.731545454545458) [It's helpful to get a full understanding of how all](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=24.277) [the components work together,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=26.777) [so we'll start by looking at a diagram that shows each component](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=27.892384615384614) [and its interaction with each other component.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=31.777) [And from there we'll go deeper into each component and see how Spring](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=35.277) [Cloud helps us implement that particular component.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=39.277) [The first thing that happens is the application service starts up.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=42.277) [And when it starts up, it calls out to the Discovery Server,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=46.277) [and it registers itself.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=49.277) [And it tells the Discovery Server its location,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=50.73154545454547) [its port, and a service identifier that others can use to find it.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=53.70557142857143) [Then at some point later, a client needs to call that application service,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=59.277) [but it doesn't know the location and the port of the service,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=62.66161538461539) [so it needs to ask the Discovery Server.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=67.277) [It sends out a request to the Discovery Server and](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=69.56271428571434) [sends along the service identifier.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=73.49922222222223) [And the Discovery Server knows that based on that service](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=76.277) [identifier which service you're asking for,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=79.9133636363636) [and it responds back with the location and the port of that service.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=82.0951818181818) [From there, things proceed as normal,](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=86.6103333333333) [and the client can request the service and its location, and the service can respond back with data.](https://app.pluralsight.com/course-player?clipId=2c48cce5-0b8f-471f-9904-360bcc2a51ad&startTime=88.73154545454545)

### [The Discovery Server](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3)

[We're going deeper with each of the key components in service discovery,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=2) [and we're going to start with the Discovery Server.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=5.644) [At its core,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=9.244) [the Discovery Server is an actively managed registry of service locations.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=10.529714285714286) [It is responsible for allowing others to find services and for](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=15.244) [services to register and deregister themselves.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=19.244) [It's the source of truth, if you will.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=23.244) [And you would typically run more than one instance of the Discovery Server as](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=25.705538461538453) [it's the key component to locate all the other services.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=30.24399999999999) [And if you can't locate the other services,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=34.244) [then you can't call the other services.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=36.377333333333326) [So this is an important piece of the overall architecture.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=38.244) [And you can find the Discovery Server implementation within](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=42.244) [the Spring Cloud Eureka Server project.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=44.69854545454546) [Throughout the course, we're going to be doing fairly simple demos,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=48.244) [things that are easy to set up and solidify the concepts.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=52.244) [So in this example,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=56.244) [we're going to learn how to create a Discovery Server using Spring Cloud.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=57.167076923076934) [And I'll detail out each of the steps,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=60.91066666666666) [and then we'll follow up with a real example.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=64.244) [Creating a Discovery Server with the Spring Cloud](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=68.244) [Eureka Server project is very easy.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=71.44400000000005) [In fact, it's almost embarrassingly easy.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=74.244) [In your pom.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=77.244) [xml of your Maven project, in the dependencyManagement section,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=78.33490909090908) [define a new dependency called spring-cloud-dependencies,](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=82.10114285714286) [and make sure it's of type pom and it has a scope of import.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=87.244) [Still within your pom.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=92.244) [xml, define a new dependency, spring-cloud-starter-eureka-server.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=94.46622222222223) [And be sure to place this within the dependency section](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=97.869) [and not within the dependencyManagement.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=104.119) [Within your application.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=107.244) [properties or your application.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=109.119) [yml, define a new property, spring.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=111.619) [application.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=115.81542857142854) [name.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=116.52971428571425) [And you can give this whatever value you want.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=117.244) [In our case here, we're going to use discovery-server.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=120.244) [Then, in your main Application class, you literally define one annotation.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=123.244) [It's @EnableEurekaServer.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=128.244) [And that's all there is to it.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=129.35511111111109) [Once you start this application up, you will having a running instance of a Discovery Server.](https://app.pluralsight.com/course-player?clipId=33cb2a65-95b0-44e1-8120-c5c599f69ba3&startTime=133.244)

### [Demo: Setting up a Service Discovery Server](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae)

[In this demo,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=1.944) [we're going to be creating and starting up our own Service Discovery](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=2.6363076923076925) [Server using the Spring Cloud Eureka Server project.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=5.944) [To start things off, let's head over to start.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=9.944) [spring.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=14.034909090909096) [io,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=14.489454545454551) [and we're going to use this Spring Initializr to](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=14.944) [create the stub for our project.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=18.543999999999993) [It's a nice little skeleton creator that saves us a lot of time.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=20.944) [In the Group section here, I'm going to put io.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=24.944) [schultz.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=29.944) [dustin, and for the Artifact I'm going to call it the discovery-server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=30.444) [In the dependencies, I'm going to add the Eureka Server,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=35.944) [this is the Discovery Server,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=39.79015384615387) [and I'm also going to add DevTools and the Spring Boot Actuator project.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=41.944) [Once you've added all those dependencies, click the Generate Project button.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=48.943999999999996) [After you click that Generate Project button,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=54.943999999999996) [it's going to automatically download a zip file for you,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=57.48945454545455) [and this contains the stub of our project.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=60.49955555555556) [Go ahead and unzip the downloaded stub project.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=64.944) [Then we're going to go ahead and open up our IDE and import it.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=66.944) [I've switched over to my IDE, which is Spring Tool Suite.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=71.944) [And on the Package Explorer tab in the blank area, right-click and go to Import.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=74.944) [And you're going to want to filter out the available](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=82.944) [options by typing in Existing Maven Projects.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=85.25169230769227) [Go ahead and click that, click Next,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=88.48945454545456) [browse to the location of the unzipped stub project,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=92.944) [and click Open.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=97.444) [Underneath the Projects you should see your pom.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=98.944) [xml.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=101.61066666666663) [Go ahead and click Finish, and give that a second,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=101.944) [and it'll import into the IDE.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=105.02092307692307) [Once the project is finished importing,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=107.19400000000002) [go ahead and expand it and open up the main application class.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=109.69400000000005) [It should be called DiscoveryServerApplication,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=113.944) [and this is where we're going to add the annotation](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=115.61066666666665) [to enable our Discovery Server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=119.67127272727272) [So right above this @SpringBootApplication annotation,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=121.944) [we can add a new one, @EnableEurekaServer.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=124.34400000000004) [Go ahead and save that.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=128.569) [We're now ready to start our Service Discovery Server,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=132.944) [so go ahead and right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=135.71323076923088) [and go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=139.12581818181823) [Once the application has finished loading,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=144.44399999999993) [go ahead and expand the Console widow.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=148.319) [And you'll notice that there are several exceptions in here.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=150.944) [Go ahead and stop the application server; otherwise,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=154.944) [it will continue to throw those exceptions.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=157.12581818181823) [Let's scroll up to one of these exceptions and see what the problem is.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=159.27733333333336) [Cannot execute request on any known server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=164.7132307692307) [And if you look, it's coming from this DiscoveryClient.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=167.944) [register method.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=171.21672727272735) [And what's happening is the Service Discovery Server is starting up,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=171.944) [and it's trying to register itself with a peer Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=176.944) [And this is mainly for high availability purposes.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=182.944) [However, when we're running in standalone or development mode,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=185.944) [it can kind of be a pain to have to set up multiple instances every time.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=189.944) [So instead,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=193.944) [we're going to configure the Eureka Server not to try](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=194.55938461538463) [to register itself with its peers.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=197.63630769230784) [And you definitely only want to do this is development mode since](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=199.6106666666667) [you want that high availability in production.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=204.02733333333327) [Let's go ahead and close the Console.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=206.944) [Then, in the Package Explorer,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=209.2773333333334) [navigate to src/main/resources and open up the application.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=210.944) [properties.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=216.27733333333325) [The first property we're going to add is actually one that we forgot previously,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=216.944) [it's the spring.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=220.64399999999998) [application.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=222.74399999999994) [name property, and we're going to set that to discovery-server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=223.44399999999993) [The second property we're going to add is a Eureka Client property,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=229.21672727272733) [so go ahead and type eureka.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=234.12581818181823) [client.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=236.944) [register-with-eureka.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=237.944) [And since we're the Discovery Server our self,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=238.944) [and we're running in standalone mode,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=244.94400000000002) [we don't need to register with any other peers](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=246.94400000000007) [because there aren't any other peers.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=249.94400000000005) [So make sure you set that value to false.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=251.944) [The next property is also a Eureka Client property, so go ahead and type eureka.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=254.94400000000007) [client.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=262.67127272727265) [fetch-registry.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=263.3076363636363) [And this property controls whether or not the Eureka Client](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=263.944) [would fetch the registry from the Eureka Server,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=266.67127272727254) [and since we are the only Eureka Server,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=269.6363076923075) [there's nothing else to fetch from anybody else,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=272.54400000000004) [so we'll set this to false.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=274.944) [And the last property we're going to add is the server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=277.086857142857) [port, and we're going to set that to a value of 8761,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=281.14399999999995) [which is the default port for Eureka Discovery Server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=285.944) [Once you get those properties in place, head over to the main application class,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=289.944) [right-click on it, and go to Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=293.48246153846156) [When your app finishes starting up, expand the console,](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=301.944) [and you'll see that it started the Eureka Server](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=304.194) [and it changed its status to UP. So you now have a running Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=50ef8a1d-1b58-4e65-b2ac-96439ae12eae&startTime=307.71323076923073)

### [The Application Service](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d)

[Remember that we're diving into each of the components of service discovery,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=2.044) [and the next on our list is the application service.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=5.498545454545455) [This is whatever is providing the functionality.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=10.044) [It's the thing that's receiving the requests from](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=13.044) [clients and returning responses.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=17.044) [And it's a dependency of other services.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=19.044) [So other services depend on its functionality to perform their functionality.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=21.377333333333326) [You would typically run one or more instances of the application service.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=27.044) [The application service is a user of the discovery client.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=32.044) [It's going to use that client to call out to the Discovery](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=35.044) [Server and register and deregister itself.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=38.47257142857141) [Just like we did for the Service Discovery Server,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=42.044) [we're going to detail out the steps needed to add a](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=45.04400000000002) [Eureka Client to an application service,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=48.50553846153845) [and then we'll actually create one ourselves.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=50.544) [In the pom.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=54.044) [xml of your Maven project, add a new dependencyManagement section,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=55.29399999999999) [and within there add a new dependency of spring-cloud-dependencies.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=59.744) [Again, make sure it's of type pom and of scope import.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=66.044) [Still within the pom.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=70.044) [xml, add a new dependency within the dependencies elements,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=71.71066666666668) [and this one is called spring-cloud-starter-eureka.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=75.90114285714286) [Then in your application.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=81.044) [properties or your application.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=82.82177777777777) [yml, add two new properties.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=84.59955555555554) [The first property is the spring.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=86.37733333333331) [application.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=88.49854545454545) [name property, and again you can set this to whatever value you want.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=88.9530909090909) [In our case, we'll use service.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=94.64400000000002) [The second property tells the application service where](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=97.044) [the Service Discovery Server is located,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=100.24400000000004) [and it's the eureka.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=103.58945454545456) [client.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=106.13490909090912) [defaultZone property.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=106.77127272727276) [And you can see we set that to localhost,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=108.044) [but in a production configuration you'd obviously set that to](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=110.81323076923076) [wherever your Service Discovery Server was located.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=114.04399999999997) [If you're wondering what the defaultZone piece is of the property,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=116.82177777777777) [don't worry about it for now.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=121.54400000000003) [We'll explain more about that in the AWS support section.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=124.044) [And then in your main Application class of your application service,](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=129.044) [you add one annotation.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=133.044) [Again, it's just one annotation.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=135.26622222222218) [The Spring Cloud guys have made it so easy for us.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=138.044) [And that is the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=141.044) [And what this does is it makes our application service](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=146.044) [register itself with the Discovery Server, and then other services can find it.](https://app.pluralsight.com/course-player?clipId=17607612-ad26-402f-aabc-b4116463a70d&startTime=150.21066666666658)

### [Demo: Making an Application Service Discoverable](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5)

[We'll use the Spring Initializr again to create our application service,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=1.611) [so go ahead and head over to start.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=6.065545454545455) [spring.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=9.701909090909094) [io.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=10.15645454545455) [And in the Group here you're going to put io.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=10.611) [schultz.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=15.611) [dustin, and we'll give the Artifact name service.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=16.111) [And you'll have pretty much the same dependencies,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=18.944333333333326) [but this time you'll want to do the Eureka Discovery](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=21.610999999999997) [dependency instead of the Eureka Server dependency.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=25.111) [And you can go ahead and add DevTools and the Actuator.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=28.611) [Go ahead and click Generate Project.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=33.611) [It'll automatically create and download a zip file for you.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=36.01099999999999) [Go ahead and unzip that zip file, and we'll import that into our IDE.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=39.91869230769232) [And we're back in Spring Tool Suite.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=45.611) [In the Package Explorer tab, right-click and go to Import.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=47.94433333333335) [And again, we want to do Existing Maven Projects.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=51.75385714285715) [Click Next, browse to the location of our unzipped file, and click Open.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=55.611) [You should see the pom.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=61.611) [xml underneath the Projects heading, and click Finish to finish the import.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=63.61099999999999) [That'll take a second, and once that's finished,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=67.52009090909087) [expand the service and go to src/main/java and open](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=70.79281818181819) [up the main application class.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=75.33827272727272) [Within the main application class, called ServiceApplication,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=77.15645454545452) [we'll add @EnableDiscoveryClient.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=82.11100000000002) [And this is what's going to turn our service application](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=85.611) [into a client of the Discovery Server,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=89.45715384615387) [and it's going to cause it to register with the](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=91.84176923076923) [Discovery Server when it starts up.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=95.03957142857143) [Underneath the SpringBootApplication annotation,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=97.611) [add a new annotation, @RestController.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=100.72211111111109) [And remember that we're doing quick and easy demos to solidify the concepts,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=104.611) [and some of the things that we're using here are definitely not best practices,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=107.94433333333333) [and you shouldn't use them in your regular applications.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=112.86100000000002) [So, for instance,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=116.611) [you wouldn't typically put an @RestController on your main application class,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=117.81100000000002) [but since we're using this to quickly demo something,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=122.06554545454544) [it's okay.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=125.411) [Let's add a new method here, public String message.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=126.21100000000001) [And we're going to return a message.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=130.71099999999996) [And we're going to want to annotate this with @RequestMapping,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=135.611) [and we'll just make this the root.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=139.611) [And the plan is to be able to start multiple](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=141.47766666666675) [instances of this service application.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=144.75385714285716) [So we're going to add a property here called private String instance.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=147.611) [And we're going to annotate this with @Value,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=151.611) [and we're going to pass in a placeholder of service.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=154.07253846153856) [instance.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=161.32528571428568) [name.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=162.46814285714282) [Go ahead and save that,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=163.611) [and then in your message return "Hello from " + instance;.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=166.736) [Under src/main/resources, open up the application.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=173.611) [properties and give this a spring.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=176.27766666666673) [application.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=180.311) [name.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=181.211) [And we'll call this service.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=182.11100000000002) [And we're going to add one more property,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=186.611) [and that's the location of the Discovery Server.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=188.4571538461538) [So you can type eureka.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=191.71099999999996) [client.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=195.2109999999999) [service-url.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=195.9109999999999) [And after the service-url, you typically put a zone,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=196.611) [and there's a default zone which we'll use.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=199.61100000000008) [It's called defaultZone.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=203.736) [And then we're going to set that to the location of](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=205.611) [our Service Discovery Server, so http://localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=207.30330769230775) [Since we're going to be running more than one](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=217.611) [instance of our service application,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=219.68792307692303) [we have to set up some run configuration so that each instance runs on](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=220.94433333333333) [a different port and has a different instance name.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=225.86099999999996) [Right-click on your main service application class,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=229.611) [go to Run As, and go to Run Configurations.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=232.1564545454546) [Highlight the Spring Boot App section and click New.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=235.42918181818186) [And under Project we're going to do service,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=238.9746363636364) [and under Main type we're going to do io.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=242.611) [schultz.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=250.8609999999999) [dustin.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=251.77766666666656) [ServiceApplication.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=252.69433333333322) [And under the Override properties section, we're going to add server.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=253.611) [port, and were going to give this a value of 8081.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=256.361) [And then we're also going to name our instance, so service.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=264.611) [instance.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=268.84176923076893) [name.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=269.2263846153843) [That's the property that we came up with.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=269.611) [And we'll call this instance 1.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=273.03957142857155) [And don't forget to name your instance, so we'll call this instance 1.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=275.611) [And then we're going to copy this run configuration](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=280.611) [to create our second instance.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=283.1824285714285) [So if you come over here to the Duplicate button,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=284.611) [click that, give it a new name of instance 2.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=287.94433333333313) [We're going to change the port to 8082 and the instance to 2.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=291.2776666666665) [Click Apply, and close that.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=298.52009090909087) [Before we start the instances of our service application,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=302.611) [we need to start the Discovery Server so they can register themselves.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=304.861) [So go ahead and expand the discovery-server,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=309.611) [right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=311.52009090909075) [and go to Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=314.01099999999997) [Once the Service Discovery Server is started up,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=319.611) [we can start up our application instances.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=322.2776666666665) [So come down to the main ServiceApplication class,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=324.611) [right-click, Run As, and go to the Run Configurations.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=327.2776666666665) [Highlight instance 1 and click Run.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=333.32528571428577) [And you can do the same thing for instance 2.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=337.611) [So right-click on the ServiceApplication,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=339.611) [Run As, Run Configurations, highlight instance 2,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=342.9443333333334) [and click Run.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=347.22638461538463) [You can look at each of the instances by clicking this drop-down over here.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=348.8417692307693) [And you can see that we have the discovery-server started,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=355.611) [the instance 1 started, and instance 2 started.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=358.611) [And we're currently looking at instance 2.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=360.611) [So if we expand out the Console, scroll over,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=363.611) [and we can see that our application successfully](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=366.6109999999998) [registered itself with the Discovery Server.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=369.361) [It says registering service, and it has a registration status of 204.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=371.611) [And we can go look at the other instance,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=376.611) [instance 1, scroll over, and we can see the same thing,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=380.76484615384607) [registering service and a registration status of 204.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=384.361) [And then if you go look at the discovery-server,](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=387.111) [and you'll see several requests in there for our service application to register itself with the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=e6e5826f-aaeb-41a0-a14c-89f2a2b2adc5&startTime=391.611)

### [The Application Client](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05)

[Let's continue with our deep dive of the components](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=1.611) [involved in service discovery.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=5.072538461538462) [Up next is the application client.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=6.611) [The application client is the piece that would call out to](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=9.338272727272729) [another application service to implement some piece of](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=13.79281818181818) [functionality in its service.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=16.896714285714282) [It's the issuer of requests, and it depends on other services.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=18.611) [And similar to the application service,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=22.611) [the application client is also a user of the discovery client,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=24.79281818181818) [but it uses the discovery client in a different way.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=28.486) [It doesn't use it to register or deregister anything.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=31.611) [It uses it to find service locations.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=34.611) [Just to be clear,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=37.79281818181817) [it's perfectly reasonable for an application to be both a service and a client.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=39.611) [An application can be a service, which provides services to others,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=45.611) [and at the same time can be a client, which depends on other services.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=49.611) [What we're referring to here is if the application was](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=54.611) [just a client and it wasn't a service.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=57.68792307692306) [The steps involved to set up a client are quite similar to](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=60.611) [the steps involved to set up a service.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=64.03957142857142) [You add this dependencyManagement section with the spring-cloud-dependencies,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=66.41099999999999) [and you add a dependency for spring-cloud-starter-eureka.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=69.83322222222223) [The differences between an application client and an](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=74.27766666666666) [application service come in the configuration.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=79.611) [We have the same two properties that we used within the application service,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=82.611) [the spring.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=87.02766666666668) [application.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=87.86100000000002) [name, except this time we set it to client, and the eureka.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=88.27766666666669) [client.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=93.27766666666669) [defaultZone so that it can know the location of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=93.69433333333336) [And since we're a client,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=98.79281818181816) [we're not interested in registering with the Discovery Server](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=100.611) [because we don't need anybody to discover us.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=104.21100000000006) [We're just interested in discovering others.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=107.30330769230771) [So you set that value to false.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=109.611) [Just like we did with the application service,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=112.11100000000003) [we'll add the @EnableDiscoveryClient annotation to our main](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=115.05544444444445) [Application class in our application client.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=118.611) [And then to actually discover services, we have two different options.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=122.611) [We can inject the EurekaClient or we can inject the DiscoveryClient.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=126.611) [And just to be clear,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=130.611) [this is the Spring DiscoveryClient and not the Netflix DiscoveryClient.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=132.1494615384616) [The first option is using the EurekaClient,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=138.611) [and the EurekaClient has a method, getNextServerFromEureka.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=142.61100000000008) [And that'll pick the next instance in a round-robin](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=146.611) [fashion from the Discovery Server.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=150.46814285714274) [And its first argument is a virtual host name or a service ID to call.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=152.611) [And this is the same as the spring.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=157.611) [application.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=161.611) [name property that we've used in our service application.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=162.111) [And the second argument is whether or not this is a secure request.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=165.79281818181823) [Once we get a reference to the instance info, we can call instance.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=169.8967142857142) [getHomePageUrl,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=175.986) [and that'll give us the base URL that we can use with](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=176.611) [our RestTemplate to call the service.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=180.03957142857132) [The second option is to use the Spring DiscoveryClient,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=183.611) [and it has a method called getInstances,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=186.38023076923088) [which returns you all service instances for a given service ID.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=189.27766666666662) [So that first argument is the same first argument](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=194.1494615384616) [that we saw in the EurekaClient,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=196.861) [which is a virtual hostname or a service ID of the service you want to call.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=198.361) [And once you have a list of instances, you can get one of those instances,](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=203.611) [and you can get the URI, turn it into a string, and that's your base URL that you would use in your RestTemplate.](https://app.pluralsight.com/course-player?clipId=c1fd7ebc-4f0e-4f0c-90e2-1673e4155d05&startTime=206.94433333333333)

### [Demo: Finding and Calling Services as an Application Client](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06)

[In order to create our client, we're going to again start off at start.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=1.411) [spring.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=7.536) [io.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=7.9735) [And we're going to give it a group ID, the same one, so io.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=8.411) [shultz.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=12.610999999999999) [dustin, and we'll make the Artifact client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=13.210999999999999) [And it will have the exact same dependencies that we](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=17.411) [used in the application service.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=20.744333333333323) [So we want Eureka Discovery, want DevTools, and we want the Actuator.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=22.411) [Click Generate Project.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=29.411) [That'll automatically create and download a zip file.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=30.50190909090909) [Go ahead and unzip that file, and we'll import that into our IDE.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=33.411) [Within Spring Tool Suite in the Package Explorer area,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=38.411) [right-click in the empty area, go to Import,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=41.411) [choose Existing Maven Projects, browse to the location of your unzipped file,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=44.320090909090936) [ensure that the pom.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=50.411) [xml shows up under the Projects heading, and click Finish to import.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=51.86554545454547) [Expand the client project, and go to src/main/java,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=56.07766666666668) [and open up the main application class.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=59.036) [In the main application class, add a new annotation, @EnableDiscoveryClient.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=63.411) [We'll also add a @RestController annotation,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=70.411) [and we'll add a handler method, public String callService.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=73.13827272727272) [And we'll give this an @RequestMapping, and we'll map this to root.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=79.411) [Then we'll want to autowire in our DiscoveryClient or our EurekaClient.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=88.411) [We'll use the EurekaClient, so private EurekaClient.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=93.411) [We'll call it client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=98.411) [And we'll use @Autowired.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=100.411) [You can also use @Inject.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=102.411) [And we'll also need a RestTemplate so we can actually call the service,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=103.56484615384613) [so we'll say private RestTemplateBuilder,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=107.63322222222222) [and we'll call this a restTemplateBuilder.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=110.12528571428571) [We will autowire that as well.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=114.411) [And within our callService method,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=118.22918181818184) [we'll create a new RestTemplate using the RestTemplateBuilder,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=121.411) [so RestTemplate restTemplate = restTemplateBuilder.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=124.411) [build.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=130.24433333333334) [And then we're going to use the client to fetch our service URLs, so client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=131.411) [getNextServerFromEureka.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=139.8485) [And the virtualHostname, remember we called our spring.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=140.411) [application.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=143.86554545454547) [name of our service.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=144.32009090909094) [We just called it service.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=146.1382727272728) [And it's going to be a non-secure request, so put false.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=148.411) [And this returns an InstanceInfo, which we'll call instanceInfo.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=152.411) [And then we can get the base URL and call the RestTemplate,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=159.411) [so String baseUrl = instanceInfo.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=163.411) [getHomePageUrl.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=169.2443333333333) [And then we'll use the RestTemplate to call the service.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=170.411) [So the RestTemplate returns ResponseEntity of String.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=174.411) [We'll call that response, and we'll say restTemplate.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=179.411) [exchange.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=185.63322222222217) [And we'll pass at the baseUrl and HttpMethod of GET.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=186.411) [We don't have any request bodies, so we'll do the requestEntity as null,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=194.411) [the responseType as String, and we don't have any uriVariables either,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=197.95645454545453) [so we'll just get rid of that parameter.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=203.85544444444446) [And let's just go over this again before we finish up here.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=207.411) [So the EurekaClient is calling out to the Discovery Server,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=210.411) [and it's getting information about a service ID called service,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=214.411) [and it's returning it back to us as an instanceInfo.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=219.411) [And then from that instanceInfo, we're getting the HomePageUrl,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=223.411) [which is the base URL of our service,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=226.411) [and then we're using our restTemplate to call that service,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=228.87253846153857) [specifically a GET on that service, and it returns a string back to us.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=231.91100000000006) [And then we're just going to return that response, so response.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=236.411) [getBody.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=240.99433333333323) [Next, we need to configure our application client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=241.411) [So head over to the src/main/resources and open up the application.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=243.411) [properties, and we'll add the standard spring.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=247.211) [application.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=252.8110000000001) [name.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=253.6110000000001) [We'll call this client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=254.411) [And then we're going to paste in the service URL so we don't have to type it,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=255.3340769230769) [and then we're going to do eureka.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=259.1252857142858) [client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=261.111) [register-with-eureka.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=261.811) [We're going to set that to false.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=262.51099999999997) [Remember, we're a client,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=267.411) [and we don't need to register with Eureka because we](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=268.411) [don't need anybody to discover us.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=271.161) [Now, before we start our application client,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=273.411) [we need to start the Discovery Server and each of](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=275.7443333333332) [the application service instances, and in that particular order.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=280.1887777777777) [So, if you've been following along, those should be in your run history.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=283.77463636363626) [So you can come up here to this drop-down and choose](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=286.8109999999999) [each of those to start those up.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=289.61099999999993) [I fast-forwarded to the point where we have all of those started up.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=292.411) [And just to confirm, we'll check the drop-down here,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=295.411) [and we can see that we have the discovery-server running,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=297.48792307692304) [and instance 1 of the service application,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=300.59281818181825) [and instance 2.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=303.411) [So now we're ready to start our client application.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=304.911) [We can right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=309.411) [go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=312.0776666666665) [Fire up a web browser and visit localhost:8080.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=317.411) [Hit Enter, and you should see a response from the client.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=321.411) [And it'll say Hello from instance 1.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=324.411) [And if you refresh it, it'll say Hello from instance 2.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=327.3276666666668) [And we can continue to do that over and over,](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=331.12528571428567) [and each time we can see that it's getting a different instance from the Eureka registry.](https://app.pluralsight.com/course-player?clipId=2f95b962-e2f5-4059-8b3a-1bc724e13d06&startTime=333.87253846153845)

### [Spring Cloud Eureka Dashboard](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8)

[One of the really useful things that the Spring Cloud](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=2.311) [Eureka Server provides is a dashboard.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=4.811) [It's enabled by default, and it's a web-based dashboard.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=7.311) [And it displays a bunch of useful information,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=11.311) [like whether or not a service is up or down and how](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=13.772538461538467) [many instances of it are registered.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=18.541769230769223) [If you still have the demo running from our last demo,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=21.311) [fire up a browser and visit localhost:8761.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=23.66814285714287) [You'll be presented with this Spring Eureka Dashboard,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=26.97766666666667) [and let's go through each of these sections here.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=31.561000000000003) [So first we have the System Status,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=35.311) [and it tells you things like the current time,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=37.31099999999999) [the uptime, and how many renewals have happened in the last minute.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=40.16814285714286) [The DS Replicas, or the Discovery Server Replica section,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=45.311) [shows you all of the peer instances of Eureka Servers.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=50.311) [So if we had more than one instance running,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=54.311) [we would see each of those instances listed here.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=56.88242857142856) [But since we've only got one instance, we just see localhost.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=59.76554545454547) [The next section is probably the most useful section as it shows you](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=63.97766666666666) [what instances are currently registered with Eureka.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=68.97766666666665) [And we have here the service ID under the Application heading, which is SERVICE.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=71.311) [AMI is for Amazon Machine Image.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=76.97766666666668) [We're not running in Amazon, so that's n/a.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=80.311) [And Availability Zones, there are two, and both of those instances are UP.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=83.311) [You can see the 2 next to the UP,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=89.311) [which indicates that there are two instances of this particular service,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=91.11100000000003) [and both of them are UP.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=94.58372727272727) [And right next to that you can see both of those instances,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=97.311) [one of them running on 8082 and one of them running on 8081.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=100.311) [The next section, the General Info section,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=105.311) [just gives you information about the particular machine that you're running on.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=107.22009090909087) [So it tells you things like the number of CPUs and the available memory.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=111.311) [And the last part, the Instance Info,](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=116.311) [gives you information about this particular running instance, so things like its IP address or whether or not it's up or down.](https://app.pluralsight.com/course-player?clipId=a89d5d61-3533-48b8-97db-89198fea3fc8&startTime=118.64433333333331)

### [Configuration](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90)

[There are several different areas where you can configure Spring Cloud Eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=1) [We'll take a look at the three main areas.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=5.911) [The first is the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=8.911) [server prefix, the second is the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=11.218692307692308) [client prefix, and the third is the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=14.44946153846154) [instance prefix.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=18.02211111111111) [Let's go into more detail into each of these areas of configuration.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=18.911) [The first one is the Eureka Server Configuration,](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=23.911) [and that's all configuration under the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=26.820090909090908) [server prefix.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=30.577666666666673) [And this is going to control everything that's related](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=31.911) [to configuring the Discovery Server.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=35.1837272727273) [The second one is the Eureka Client Configuration,](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=36.81099999999999) [and that's all configuration under the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=39.511) [client prefix.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=43.71100000000001) [And this is responsible for controlling how the discovery](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=44.911) [client interacts with the Discovery Server.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=48.51099999999999) [So for instance, you have things like the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=50.729181818181836) [client.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=56.51100000000001) [eureka-server-connect-timeout-seconds.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=57.71100000000001) [This would control how long the client waits to connect to](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=58.911) [the Eureka Server before it times out.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=62.295615384615374) [The third area of configuration is the Eureka Instance,](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=64.99433333333334) [and that's all configuration under the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=69.0019090909091) [instance prefix.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=72.82009090909092) [And a Eureka Instance is anything that registers itself with the](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=73.911) [Eureka Server so that it can be discovered by others.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=78.911) [The properties under the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=81.911) [instance prefix control how the instance registers](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=83.91100000000003) [itself with the Eureka Server.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=87.05385714285714) [So for instance, you have things like the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=89.911) [hostname or the eureka.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=92.91099999999996) [health-check-url, and the instance could be configured with custom values there, and that's how it would register with the Eureka Server.](https://app.pluralsight.com/course-player?clipId=00e76d39-2881-46e9-b38a-cc5e79476f90&startTime=94.35544444444444)

### [Health and High Availability](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9)

[The Spring Cloud Eureka Server also has some additional](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=2.111) [features around health and high availability.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=4.810999999999999) [It's constantly ensuring that the application services that it's returning](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=7.333222222222223) [or handing back to clients are healthy and available.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=11.511000000000003) [And it also ensures that in the event that the Discovery Server goes down,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=14.77766666666667) [all clients can still continue to operate.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=20.292818181818173) [Like I mentioned,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=23.111) [the Eureka Server is constantly concerned with the health of the](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=24.20190909090909) [application services that it's handing out to clients.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=28.47463636363636) [And it assesses that health, at least by default,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=32.111) [by sending the clients a heartbeat every 30 seconds.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=35.11100000000002) [And if it doesn't hear back from that heartbeat after 90 seconds,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=38.61099999999998) [it removes it from the registry.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=43.61099999999998) [Sending a heartbeat is the default configuration,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=46.111) [but you can also configure the Eureka Server to hit an endpoint,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=48.02009090909091) [such as the /health endpoint that comes with Spring Boot Actuator.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=53.111) [Eureka was built with high availability in mind,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=58.111) [and one of the ways that it achieves that is when a client requests](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=59.957153846153865) [a service location from the Discovery Server,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=64.86099999999999) [the Discovery Server actually sends back a copy of the registry.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=67.56554545454544) [And what ends up happening is the registry gets](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=71.34176923076923) [distributed across all of the clients.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=74.111) [And if the Service Discovery Server goes down,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=76.83827272727272) [those clients can continue to operate.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=80.44433333333333) [You're probably thinking well wait though.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=83.111) [What if the Discovery Server has new information or](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=85.111) [one of the services goes down?](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=88.86100000000005) [Well, the client has to renew its lease or fetch a new registry every so often,](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=91.4956153846154) [and it does so by fetching deltas to update its registry.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=98.25385714285717) [So it's pretty smart about not fetching the full registry again and only getting the changes.](https://app.pluralsight.com/course-player?clipId=3fbb377a-cef6-4d17-9497-94fc368e82d9&startTime=102.36100000000002)

### [AWS Support](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15)

[It's well known that Netflix is a heavy user of AWS.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=1.678) [And given that Eureka was born at Netflix,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=5.678) [it's only fitting that it includes AWS support.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=8.13953846153846) [Let's take a look at the various support,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=10.76890909090909) [as well as a typical deployment architecture.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=13.678) [When an application that's using the Eureka Client starts up,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=17.678) [it checks to see if it's running on an AWS instance.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=20.678) [If it is,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=24.678) [it calls out to the local metadata service and retrieves](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=25.60107692307692) [some metadata about that instance.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=28.678) [And it gets things that are specific to AWS,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=30.041636363636368) [such as the Amazon Machine Image that's running or what](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=33.178) [region it's running in or what zone.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=37.985692307692304) [And then it sends that information up to the Discovery Server when it registers.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=40.13953846153845) [Given the fact that things can change so often in AWS,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=45.678) [it's important that the Discovery Server be located at a well-known location.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=49.678) [So Eureka adds support for Elastic IP binding.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=54.678) [When a Eureka Server starts up and it notices that it's running in AWS,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=58.678) [it'll try to bind to the next available Elastic IP so](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=63.01133333333333) [that it has a static or well-known IP.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=66.67799999999997) [The Eureka Client is also zone aware with a preference for](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=69.98569230769233) [the zone that it's currently running in.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=74.57799999999999) [So it'll try to contact the Discovery Server in its current zone,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=76.678) [and if it can't reach one,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=82.678) [it'll try the next zone and try to find the next available Discovery Server.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=84.178) [And last,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=88.678) [you can configure the Eureka Client to fetch the](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=89.678) [registry of different remote regions.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=94.67799999999997) [In order to utilize the AWS support,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=97.678) [it requires a little bit of extra configuration.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=100.47800000000004) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=103.678) [you define a new method that returns a EurekaInstanceConfigBean,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=105.01133333333331) [and you annotate that with @Bean.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=108.3922857142857) [And within the method, you create a new EurekaInstanceConfigBean.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=112.678) [Then you create an AmazonInfo object using the AmazonInfo.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=117.678) [Builder,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=122.178) [and you set the DataCenterInfo on the EurekaInstanceConfigBean](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=122.678) [to that AmazonInfo and then return that bean.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=126.678) [If you were to go and look at the source of the AmazonInfo class,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=131.678) [you would see that it's utilizing the local metadata service](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=135.678) [to fill in all of the instance information.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=139.01133333333343) [In addition to the configuration in your @Configuration class,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=142.678) [there's also some additional configuration in your application.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=145.678) [properties, and that's around configuring the availability zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=149.23355555555554) [The property is the eureka.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=153.678) [client.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=156.178) [availability-zones property, and the pattern is eureka.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=156.678) [client.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=161.428) [availability-zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=162.178) [region, and then that's equal to a comma-separated list of availability zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=162.928) [So for example,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=168.678) [if you have the following where you have one Discovery Server in the us-east-1b](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=169.37030769230768) [zone and another Discovery Server in the us-east-1e zone,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=173.49618181818187) [you would set up your property as follows: eureka.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=177.878) [client.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=183.23355555555554) [availability-zones, and then the region is us-east-1,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=183.78911111111108) [and then you would set the comma-separated list of us-east-1b and us-east-1e.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=187.678) [Similar configuration is required in the application.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=193.678) [properties for your service URLs.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=196.7891111111112) [The property is the eureka.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=199.58709090909088) [client.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=202.768909090909) [service-url.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=203.40527272727263) [zone property,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=204.04163636363626) [and you set that to the HTTP address of the Eureka](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=205.21646153846154) [Instance that's bound to an Elastic IP.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=211.13953846153856) [And you want to make sure, at least as of version 1.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=213.27800000000008) [4,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=216.67800000000003) [to use the Elastic IP DNS name as the code is specifically aware of](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=217.01133333333337) [the pattern that Elastic IPs use for DNS names,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=222.178) [and it's looking for that specific pattern to](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=226.678) [recognize if it's using an Elastic IP.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=229.34466666666674) [If, for instance, we had the following Elastic IPs allocated to us,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=231.67800000000003) [we could configure our application.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=235.87800000000001) [properties as follows: with the first one being the us-east-1b zone](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=237.87800000000004) [and then second one being the us-east-1e zone.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=243.178) [And if you'll notice,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=246.60107692307693) [each of those is set to the Elastic IP DNS name for the HTTP address.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=248.13953846153848) [Following along with the previous screenshots of the AWS](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=256.678) [console and how we configured everything,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=259.95072727272736) [if you were to load up your Eureka Dashboard after setting all of that up,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=262.01133333333325) [it would look like this.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=266.428) [You would have two instances under your DS Replicas,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=267.678) [and then you would have two instances of Discovery Servers,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=270.6779999999998) [each in their respective availability zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=274.47799999999984) [Likewise,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=277.678) [you'd be able to pull up the dashboard on each of](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=277.9087692307692) [those Discovery Server instances, and you'd find AWS-specific metadata filled in,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=280.4472307692307) [like the instance-type or the ami-id or the instance-id.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=286.7689090909091) [Now that we have an understanding of the AWS support that exists in Eureka,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=291.678) [let's take a look at a deployment architecture.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=296.12244444444445) [Typically you would have one or more Discovery](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=299.678) [Servers per each availability zone,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=302.587090909091) [and then you'd have multiple availability zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=304.5668888888889) [And within each of those zones,](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=307.678) [you would have one Elastic IP for each of the Discovery Servers.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=309.820857142857) [Then you would typically have an auto scaling group set up that evenly distributes those Discovery Servers across the availability zones.](https://app.pluralsight.com/course-player?clipId=789cde5e-351d-4519-8b73-23363e7a1f15&startTime=313.768909090909)

### [Summary](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5)

[We've reached the end of this module, so let's quickly go over what we learned.](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=1.667) [We started off by taking a look at what service](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=5.667) [discovery is and why it's important.](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=8.792) [Then we learned how to use the Spring Cloud Eureka Client to discover](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=10.667) [services and the Spring Cloud Eureka Server to store a registry of](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=14.667) [services so that others could discover them.](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=19.667) [Then we took a quick look at the Spring Cloud Eureka Dashboard and](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=22.667) [saw an insight into the Spring Cloud Eureka Server.](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=26.667) [From there, we talked about health checks,](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=29.667) [high availability, and configuring Spring Cloud Eureka. And we finished off by looking at the AWS specific support.](https://app.pluralsight.com/course-player?clipId=14a84066-711a-4a9e-bdcb-253c064ceee5&startTime=32.7781111111111)

## [Configuring Services Using Distributed Configuration](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810)

### [What Is a Configuration Server?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810)

[Hi everyone, my name's Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=0) [and in this module we'll talk about managing your application](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=2.5) [configuration in a distributed system like the cloud.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=6.777777777777779) [We'll jump right in with configuration in a distributed system and why its](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=11) [different and more challenging than a non-distributed system,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=15.444444444444445) [and more importantly, why we need this thing called a Configuration Server.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=19) [From there,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=24) [we'll dive into the details behind the way Spring Cloud implements a](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=24.5) [Configuration Server with the Spring Cloud Config Server.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=28.200000000000003) [And we'll see how you can set up a Config Client and a Config](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=33) [Server and get them talking to each other.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=36.73333333333332) [We'll also quickly go over the various back-end storing](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=38.615384615384635) [options for Spring Cloud Config Server,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=41.33333333333333) [such as a Git repository or an SVN repository.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=44) [Next, and one of the things that I think is the coolest,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=49) [we'll learn how to update our configuration on the fly](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=52) [without ever restarting our application server.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=54.5) [And we'll do that with a variety of methods including the Spring Cloud Actuator,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=56.45454545454547) [Spring Cloud Bus, and the Spring Cloud Monitor projects.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=62.5) [Then we'll also learn about the @RefreshScope annotation](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=66.18181818181816) [and why it's needed and where to use it.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=69.25000000000001) [We'll finish out the module on a section about retrieving](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=73) [and storing your sensitive configuration values using](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=77.16666666666671) [symmetric and asymmetric encryption.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=81.33333333333336) [So,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=84) [what exactly is so different about managing the configuration in a](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=84.41666666666667) [cloud-native application versus a non-cloud-native application?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=89) [The answer to that stems from the fact that a cloud-native](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=94) [application is a distributed system and non-cloud-native](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=96.75) [applications are not distributed.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=100.59999999999997) [And in a non-distributed application,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=103) [you typically only have a handful of configuration files.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=105.00000000000003) [It's often a one-to-one relationship between a system and its configuration.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=109.22222222222223) [And as you move to a distributed system, that configuration explodes.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=113.99999999999997) [You go from having one or more to many,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=120) [many configuration files because you have many,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=124.5) [many systems that make up one system as a whole.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=127.42857142857144) [For instance, if you're using microservices,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=131) [each one of your individual microservices that composed your overall](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=132.80000000000007) [application would have its own configuration file.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=137.75) [You might be thinking no problem Dustin.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=142) [We've got this.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=143.39999999999992) [That's why they make configuration tools like Puppet and](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=144) [Chef for managing configuration in many,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=148.0909090909092) [many systems, right?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=151.28571428571433) [Well, it'll work, but it's not ideal for the cloud.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=153) [Let's talk about some of the issues that you would face with](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=157) [using a typical configuration management system.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=159.57142857142867) [The first is that it's typically deployment oriented.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=161.77777777777783) [And that means that any time you want to make a configuration change,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=165.09090909090912) [you have to kick off a new deployment so that the configuration is modified.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=169.92307692307693) [And typically the application is then usually restarted.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=175.40000000000003) [What if, for instance,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=178) [you needed to make a temporary logging configuration change to debug an issue?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=179) [Kicking off a whole new deployment and restarting applications is a](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=185) [pretty heavy process just for a temporary change.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=189) [Another issue that you would encounter is the way in which](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=192) [configuration changes make it to the application servers.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=195) [And that's via a push.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=200) [Pushing application configuration to servers in a cloud](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=202.00000000000003) [environment is usually not dynamic enough.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=205.33333333333337) [And by that, I mean it needs to know where to push the configuration to.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=208) [And in the cloud that's usually not a straightforward answer as application](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=213) [instances can come and go at any given point in time.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=217.5) [When you push configuration,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=223) [you run the risk of missing a newly started instance that,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=224) [for instance,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=227.3636363636364) [came online as a result of auto scaling during a high-traffic period.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=228.27272727272734) [Okay, so no problem.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=234) [If push doesn't work, we can just use pull, right?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=235.42857142857144) [Well, that has problems too.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=239) [When you pull configuration,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=240.6666666666667) [you typically use a pulling mechanism where you check](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=242) [for changes every x number of minutes, and if there are changes,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=246.9090909090908) [then you pull those changes down.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=250.30769230769226) [And that introduces latency from the time that we change our](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=252.24999999999997) [configuration to the time that it actually takes effect.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=256.72727272727275) [Well, if configuration management tooling doesn't solve our problem,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=260) [then what exactly does?](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=264) [The answer to that is something called a Configuration Server.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=265.42857142857133) [Or, to be more specific, an Application Configuration Server.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=269) [An Application Configuration Server is a dedicated,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=274) [dynamic, and centralized key/value store for storing your configuration.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=277.5) [And it could be distributed or non-distributed.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=283) [And similar to configuration management,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=286) [it's the authoritative source for all configuration.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=288.2222222222223) [It provides things like auditing and versioning,](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=291.33333333333337) [and it also has cryptography support so that you can encrypt or decrypt those sensitive configuration values.](https://app.pluralsight.com/course-player?clipId=67274c6c-f8cb-4ef5-9f9e-8dda90684810&startTime=294.3636363636364)

### [Introducing Spring Cloud Config Server](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa)

[Managing your application configuration with help from](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=1.733) [Spring Cloud is really quite easy.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=4.533) [By default,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=7.733) [Spring Cloud provides you with several different ways to implement a](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=8.278454545454546) [Configuration Server with almost no work on your part.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=11.64209090909091) [The first two options, Spring Cloud Consul and Spring Cloud Zookeeper,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=15.733) [are integrations with third party applications,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=19.733) [Consul and Zookeeper, respectively.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=23.932999999999996) [You may or may not be familiar with Consul and Zookeeper,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=26.733) [and in case you're not,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=29.875857142857132) [it's important to note that neither of them is just a Configuration Server.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=31.399666666666665) [Both are commonly utilized for other purposes like service discovery.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=35.733) [The third option, Spring Cloud Config Server,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=40.733) [is an implementation that was built by the Spring Cloud team.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=43.53299999999999) [And it has one sole purpose, and that's to be a Configuration Server.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=47.59014285714283) [We'll focus specifically on this option,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=52.91481818181817) [but it should be pretty easy to utilize the others once you](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=55.34838461538461) [have a firm understanding of the concepts.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=59.108) [In addition to including the implementation of the Spring Cloud Config Server,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=61.733) [the Spring Cloud Config project also includes client-side support](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=67.17744444444445) [for connecting and interacting with the server.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=71.233) [The Config Client, which is usually imbedded in your application,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=74.733) [fits perfectly into Spring's Environment abstraction.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=77.733) [And that means that all the ways that you're already familiar with getting](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=82.733) [access to configuration can be used to get access to configuration that](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=86.09663636363636) [was retrieved from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=90.483) [The Config Server is usually a standalone application,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=92.733) [and it also fits perfectly into one of the Spring framework abstractions,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=96.36936363636363) [and that's the PropertySource abstraction.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=101.733) [So, if you're not familiar with the PropertySource abstraction,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=104.733) [you've probably actually already used it.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=107.733) [For instance,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=109.983) [if you've ever referred to a properties file in your](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=110.733) [application using the classpath prefix,](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=114.3693636363636) [then you've already used the PropertySource abstraction.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=116.91481818181819) [And all of the configuration that comes from the](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=120.733) [Configuration Server is just another property source. It's a property source that's remote.](https://app.pluralsight.com/course-player?clipId=6cfc01d4-1e7b-4661-8534-aa602e3b12aa&startTime=124.82390909090908)

### [Using the Spring Cloud Config Server](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8)

[As we've already discussed,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=2.133) [the Spring Cloud Config Server is an implementation of a Configuration Server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=3.587545454545455) [Let's take a deeper look at the functionality that it](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=7.951181818181817) [provides and how to get one set up.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=11.466333333333335) [At its core, the Config Server is just another web application,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=14.133) [and it provides a REST-based interface for accessing your configuration files.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=18.133) [So you set up your configuration files, you name them appropriately,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=24.133) [and then you tell the Configuration Server where they're located,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=27.133) [and it'll serve them up for you.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=30.133) [It's important to point out that the Config Server does not](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=32.132999999999996) [facilitate writing any configuration files,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=35.910777777777774) [and it's only mainly concerned with serving those configuration files.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=38.133) [It has support for various output formats,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=43.133) [and the default is JSON, but it also supports properties and YAML.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=46.04966666666665) [The Config Server doesn't need a database to store the configuration,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=50.67845454545457) [and instead it has support for retrieving and reading your](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=55.04966666666665) [configuration files from several different back-end](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=59.35522222222222) [storage configurations like Git, which is the default,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=62.02188888888889) [or SVN, or just the plain old filesystem.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=65.57744444444444) [Another nice feature that the Configuration Server supports is](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=69.133) [it has some notion of configuration scopes.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=73.22390909090907) [And what I mean by that is that you can define global](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=76.05607692307693) [configuration that applies to all applications,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=81.133) [as well as application-specific configuration or](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=84.133) [Spring Profile specific configuration.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=88.33300000000001) [Using the Spring Cloud Config Server, like Spring Cloud's other servers,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=91.133) [is very, very easy.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=95.59453846153846) [First, in your pom.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=97.44069230769233) [xml,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=99.2868461538462) [make sure that you have the spring-cloud-dependencies defined](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=99.74838461538467) [within your dependencyManagement section.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=105.02188888888885) [Then, still in your pom.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=108.133) [xml, in the dependency section,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=110.05607692307693) [define a new dependency on spring-cloud-config-server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=111.97915384615386) [Next,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=115.383) [create a folder to store all of your configuration that you](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=116.133) [want the Configuration Server to serve up.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=121.67845454545451) [And in that folder you can optionally create an application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=124.38300000000001) [properties file or an application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=128.758) [yml file.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=131.883) [And this file is for a global configuration that should apply to all](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=133.133) [applications and not any one specific application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=137.133) [An example of that would be something like your database](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=142.133) [configuration that is shared across all of your applications.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=144.86027272727281) [You would put it in this application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=149.133) [properties or application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=151.4663333333334) [yml file.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=152.46633333333344) [Next you add application and profile-specific](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=153.133) [configuration files in this folder,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=156.46633333333327) [and you can put them in either properties or YAML format.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=158.90223076923078) [And you use a special naming pattern for the file name,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=163.133) [and that's the application-profile.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=167.8472857142856) [extension where application is the name of your application and profile is the](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=169.91077777777778) [Spring Profile that should apply for that configuration.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=178.82530769230775) [If you're not using a Spring Profile,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=183.133) [you can omit the -profile section of the file name](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=185.4663333333334) [and just use the application name.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=189.44069230769227) [file extension.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=192.209923076923) [Next you would run git init within your folder that](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=193.133) [contains all of your configuration files.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=196.20992307692322) [And this example assumes that you're using the default back-end storage,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=198.03300000000004) [which is Git.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=201.84728571428568) [And from there you would git add your configuration files,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=203.133) [git commit them, and then the last step,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=206.133) [which is optional, but highly recommended,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=209.76936363636375) [is to set up a remote Git repository and git push the](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=212.51761538461537) [configuration up to the remote repository.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=218.383) [Now we need to configure the actual Configuration Server itself.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=222.133) [Now don't confuse this with the configuration files that](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=226.133) [the Configuration Server will be serving.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=228.8330000000001) [This is the application configuration for the actual Configuration Server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=231.3552222222223) [In the Config Server's application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=237.133) [properties file, you specify the server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=239.13300000000004) [port property and give that the value 8888.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=241.57744444444447) [This isn't required,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=245.133) [but that port is the conventional port that's used for the Configuration Server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=246.22390909090913) [Then you need to configure the location of the Git repository that contains](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=250.95118181818188) [all of the configuration files that the server will serve.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=255.67845454545463) [And you do that by specifying the property spring.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=258.9791538461539) [cloud.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=262.36376923076926) [config.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=262.9791538461539) [server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=263.59453846153855) [git.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=264.2099230769232) [uri, and then you set that to the location of the Git repository.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=264.82530769230783) [Now if you'd uploaded that to a remote repository,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=271.44069230769213) [this would be the clone URL of your repository.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=275.04209090909086) [If you prefer to use YAML files for your configuration,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=279.133) [I've included the equivalent application.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=282.133) [yml.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=284.633) [The next step is to add the @EnableConfigServer](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=285.133) [annotation to your main Application class.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=288.7693636363635) [And while you're in here,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=291.1329999999999) [if you wanted your Configuration Server to be](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=292.7996666666665) [discoverable via service discovery, you could add the Eureka Client dependencies,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=296.633) [configure the service discovery URL,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=301.9329999999998) [and add the @EnableDiscoveryClient annotation,](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=304.5615714285714) [and then clients would be able to discover the Configuration Server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=308.133) [The last step is to ensure that your Configuration](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=313.133) [Server is set up in a secure fashion.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=315.7044285714285) [And it's very easy to do that using the Spring Security library.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=318.3329999999999) [And any of the methods that are supported in Spring Security are also supported in securing your Configuration Server.](https://app.pluralsight.com/course-player?clipId=8ca95f85-9eec-4965-b441-69daf9df2dd8&startTime=323.133)

### [Config Server REST Support: Parameters](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286)

[Typically when you're interacting with the Config Server's REST endpoints,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=2.1) [you're doing so using the Config Client; however,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=5.6) [it's useful to understand the available endpoints,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=9.6) [at least for debugging purposes and also if you want](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=13.1) [to use it in another language.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=16.225) [Each of the available REST endpoints on the Config](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=18.1) [Server share a common set of parameters.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=21.850000000000012) [And the values of those parameters influence the configuration that's returned.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=24.699999999999996) [The first parameter is the application parameter.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=30.1) [And if you're utilizing the Spring Cloud Config Client,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=34.1) [it uses the value from the spring.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=37.10000000000002) [application.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=39.76666666666666) [name property to fill in the value for that application parameter.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=40.18333333333332) [The next parameter is the profile parameter.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=44.918181818181814) [And again, if you're using the Spring Cloud Config Client,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=48.1) [it's going to pull the value from the spring.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=52.1) [profiles.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=56.6) [active property to fill in the value for that profile parameter.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=57.1) [So this translates into the active Spring Profile.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=61.1) [The last parameter, the label parameter,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=65.1) [is a feature for grouping your configuration files](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=67.28181818181815) [into kind of arbitrary named sets.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=71.10000000000001) [And that could mean different things depending on the back-end you're using.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=75.1) [So for instance, if you're using Git as a back-end,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=79.1) [the label translates to the Git branch.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=83.1) [Now take a second to look at each of these endpoint parameters,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=86.10000000000001) [and consider them as a whole,](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=90.9181818181818) [and think about how you might combine one or two or all of them together to identify a particular configuration.](https://app.pluralsight.com/course-player?clipId=4c0f451d-fb56-4fb2-93a5-1d84c981c286&startTime=93.1)

### [Config Server REST Support: Endpoints](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6)

[By now we should have a good understanding of the purpose of each of the](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=1.8) [path-based parameters that are involved in the REST endpoints.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=5.3) [Let's take a look at the actual REST services themselves.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=9.8) [The first endpoint takes up to three of the parameters](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=12.8) [that we discussed with the third, the label parameter,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=15.3) [being optional.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=19.6888888888889) [Let's take a look at a couple of examples that can](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=20.8) [make this a bit more concrete.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=24.035294117647048) [The first example is /myapp/dev/master.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=25.8) [And myapp is the application name, dev is the Spring Profile,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=29.800000000000004) [and master is the Git branch, which translates into the label.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=36.29999999999998) [We have another example where it's slightly different than the first example.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=40.61818181818183) [You have myapp as the application, that's the same,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=45.8) [but you have a different profile, and that's the prod profile.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=48.56923076923076) [And you also have a different label, which is the v2 Git branch.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=52.8) [Now the last example is kind of important.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=58.8) [We've got two parameters that are required,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=61.8) [the application parameter and the profile parameter.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=65.99999999999999) [And then that label parameter is optional.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=69.25454545454544) [And when you use Spring and you don't set an active profile,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=71.8) [you might not know, but it sets one for you,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=75.8) [and it's called default.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=78.65714285714292) [So if you were wanting to get access to the configuration that](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=79.8) [didn't apply to any particular Spring Profile,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=83.49230769230768) [you would give it your application name and then the value default.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=85.98181818181816) [The next endpoint utilizes only two of the three parameters that we discussed,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=91.8) [the application parameter and the profile parameter.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=95.425) [It allows you to request either YAML or properties files,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=99.8) [and it doesn't necessarily matter what the source file is.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=103.8) [So, for instance, if you had a source file in the YAML format,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=106.8) [you could still request it in the properties format,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=111.8) [and it would automatically convert it for you.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=114.05) [The examples are very straightforward.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=116.80000000000003) [You have something like /myapp-dev.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=118.8) [yml or something like /myapp-prod.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=122.89090909090906) [properties.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=126.98181818181813) [And just like the last endpoint, you have to have a profile,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=127.8) [so you could have something like /myapp-default.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=131.8) [properties.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=137.05) [The last REST endpoint is very similar to the one we just looked at](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=137.8) [with the exception that you have to specify a label.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=141.8) [In fact,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=144.8) [they can be equivalent if the label you specified is master as the](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=145.72307692307692) [previous endpoint always assumes that the label is master.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=151.52727272727276) [Just like the other examples, it's pretty straightforward.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=154.8) [Here's an example where we have /master/myapp-dev.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=157.8) [yml where master is the label, myapp is the application,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=162.2545454545454) [dev is the profile,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=167.8) [and you've chosen to use a YAML extension so you'll get it back in YAML format.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=169.8) [And a very similar one, except this time it is a v2 for the label or the branch,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=174.8) [the Git branch, and myapp-prod, the same application name,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=181.07272727272726) [with prod being a different profile.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=186.8) [And this time you've requested a properties format so](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=188.3) [it'd be returned in properties.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=190.925) [And the last example is a lot like the first example where you](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=192.8) [have /master/myapp- and then the profile.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=197.4428571428572) [And since the profile is a required value,](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=200.52727272727267) [remember we need to use the value default to represent that default profile, and then you're requesting it in the properties format.](https://app.pluralsight.com/course-player?clipId=0ba39936-5b97-4543-8aba-de7658e0c0b6&startTime=204.63333333333333)

### [Demo: Setting up a Configuration Server](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8)

[In this demo, we're going to be building and starting up our own Config Server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=2.2) [So the easiest way to get started is to head over to start.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=6.2) [spring.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=12.266666666666667) [io.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=12.733333333333334) [For the Group ID we'll use io.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=13.2) [schultz.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=16.31111111111111) [dustin.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=16.755555555555553) [For the Artifact we'll use config-server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=17.2) [For the dependencies, we'll add the Config Server dependency,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=19.866666666666656) [and then we'll also add the Eureka Discovery dependency.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=23.700000000000006) [Now this is an optional dependency,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=27.533333333333328) [but it will allow our Config Server to register itself with the](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=30.2) [Discovery Server so that Config Clients can find it.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=35.2) [And last, we'll use the Actuator dependency.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=38.2) [Once you've got everything selected, go ahead and click Generate Project.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=42.2) [That will create a zip file, and go ahead and unzip that,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=46.2) [and head over to your IDE.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=50.2) [Within Eclipse, or STS, right-click on the empty Package area,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=53.2) [go to Import, search for Existing Maven Projects,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=57.2) [select it, click Next, browse to the location of the downloaded zip file,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=63.59999999999998) [so mine's in Downloads, config-server, open that,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=69.2) [and click Finish to finish importing it.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=73.01818181818183) [Expand the config-server project and navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=76.7) [Within the main application class, add the @EnableConfigServer annotation.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=81.97777777777777) [Save that and close that file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=87.00000000000001) [Next, expand the src/main/resources folder and open up the application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=91.2) [properties.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=96.65454545454547) [Within the application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=97.2) [properties, add a server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=98.56363636363636) [port property and set that equal to 8888.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=100.38181818181818) [Next,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=104.35384615384613) [we need to configure the Config Server to know where the](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=104.89230769230767) [configuration repository is located.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=110.91428571428571) [So we'll say spring.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=113.2) [cloud.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=115.48571428571428) [config.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=116.05714285714285) [server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=116.62857142857142) [git, we're going to use a Git repository,. uri,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=117.19999999999999) [and then we're going to set that to a config repository.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=122.27692307692307) [Normally you would set this to the location of your](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=128.2) [own configuration repository,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=130.7) [but for this demo we're going to use a prebuilt one that's on GitHub.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=131.6) [So go ahead and open up a browser.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=137.2) [In the address bar, type github.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=140.2) [com/dustinschultz/scf-config-repository.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=151.34285714285716) [We're going to be forking this repository,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=153.2) [which means we're going to be creating a local copy in our own GitHub account.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=154.95) [And that requires that you have your own GitHub account.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=160.2) [So if you don't already, make sure that you sign up for one.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=163.2) [And if you do, make sure you sign in.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=166.2) [Once you're all signed in, click the Fork button in the top right corner,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=168.7714285714285) [and that'll create a fork for you.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=172.96923076923088) [Once you've got your fork created,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=175.20000000000002) [it'll look very similar to the unforked version,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=177.20000000000007) [but underneath the repository name at the top it'll say forked](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=180.47272727272733) [from dustinschultz/scf-config-repository.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=187.4857142857143) [Next we want to grab the clone URL, so head over to this green button,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=189.2) [click it, and copy the clone URL to your clipboard,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=194.2) [and head back over to your IDE.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=197.05714285714276) [Back in Eclipse, or STS, we want access to the Git repository's view.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=200.2) [And you can do that by going to Window, Show View,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=205.2) [Other, and choose Git Repositories.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=209.78333333333322) [Within the Git Repositories view,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=212.42222222222216) [click on the link that says Clone a Git repository.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=215.2) [It'll pop up a new window.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=219.2) [Choose Clone URI.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=221.20000000000005) [Hit Next.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=222.2) [Since we copied it to our clipboard,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=223.0888888888889) [it should automatically show up in the URI section with the host](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=226.2) [and the repository path filled in as well.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=229.89230769230784) [If it's not, just pasted in that clone URL that we copied into the URI.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=232.35384615384623) [Go ahead and click Next, choose the master branch, and click Finish.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=237.2) [Since we still have the clone URL on our clipboard,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=244.2) [let's set up the Config Server's Git URL by clicking in the application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=247.05714285714276) [properties and pasting in that value.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=251.47272727272735) [Make sure you save that, and then you can close that file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=253.43076923076927) [Head back over to the Git Repositories view and expand the repository.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=257.19999999999993) [Right-click on the Working Tree and choose Import Projects.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=261.94999999999993) [A new dialog box will pop up, and just click Finish.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=267.2) [In the Package Explorer, expand the config repository project,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=270.2) [and you'll notice that there are three configuration files.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=274.2) [Let's take a look at the first configuration file, the application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=277.2) [properties.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=280.86666666666645) [This is where all of the global configuration goes.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=281.2) [The application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=284.2) [properties applies to any application that asks for](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=285.2) [configuration from the Config Server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=289.2) [Next, open up the config-client-app.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=291.4222222222223) [properties file,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=293.64444444444445) [and note that this is an application-specific configuration file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=294.53333333333336) [So this would only apply to an application named config-client-app.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=298.8666666666666) [When we demo the Spring Cloud Config Client,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=304.2) [we'll configure the Spring application name of that project](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=308.2) [to be the config-client-app so that this configuration only](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=312.7) [applies to that application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=317.2) [Go ahead and open up the last configuration file, the config-client-app-prod.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=319.01818181818174) [properties file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=326.2) [And this configuration file is similar to the one we just looked at.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=328.2) [And it would apply to the same application,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=331.2) [but instead it would only apply to the application if the application](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=334.27692307692286) [was running with the Spring Profile named prod.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=338.10909090909075) [Let's close all of these configuration files and](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=341.2) [start up our Configuration Server.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=345.3428571428571) [So go over here to the config-server, expand it,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=348.2) [find the main application class, right-click on it,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=350.45) [and go to Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=354.6615384615384) [Once the Configuration Server is started,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=360.2) [let's open up a browser and hit some of the REST endpoints.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=361.7) [Once you've got your browser open, visit localhost:8888/.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=366.2) [And then remember that it's the application name/profile/label,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=372.2) [so application name will be config-client-app.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=377.2) [And remember that the profile parameter is a required parameter,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=383.2) [so if we want to see the default configuration for the](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=387.2) [Config Client app without any Spring Profile,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=391.43076923076893) [we use the value default as the default profile.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=394.7) [The default return format is in JSON,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=399.2) [and the important points of this are the property sources.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=401.35384615384623) [Notice that the bottom property source is the application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=405.01818181818174) [properties.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=409.3111111111111) [That's the global properties that applies to every application.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=409.8666666666666) [And then the property source above that,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=414.3999999999999) [which overrides any of the global property sources,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=417.2) [is the config-clien-app.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=421.2) [properties.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=422.5636363636363) [If we modify the URL and replace default with prod,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=423.01818181818174) [we'll see that it brings in the config-client-app-prod.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=427.1) [properties file, which overrides all of the property sources below it.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=429.95) [Don't forget that we also have a couple other endpoints,](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=436.86666666666673) [like an endpoint to request the.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=441.10909090909087) [properties file or the.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=443.8363636363635) [yml file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=445.5125) [So if we go up here, we take out /prod and we replace it with.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=446.1375) [properties, we'll see that it returns back a properties file.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=451.2) [And you'll see that it's actually applied all of the property](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=456.2) [sources in the order which take precedence.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=458.95) [So you see that some.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=461.59999999999985) [other.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=463.6545454545454) [property is still global, but some.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=464.10909090909087) [property was overridden by the app specific overridden value.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=466.8363636363635) [And you can do the same thing with YAML.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=470.59999999999985) [It will actually convert the source.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=474.2) [properties files into YAML format for you.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=476.9692307692307) [So instead of.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=480.2) [properties, we'll replace this with.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=481.45000000000005) [yml, and we hit Return, and you can see that it output the same configuration in YAML format.](https://app.pluralsight.com/course-player?clipId=7649e123-e004-46f3-9bdc-91e53067c6e8&startTime=483.5333333333335)

### [Using the Spring Cloud Config Client](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37)

[Now that we've seen how the Spring Cloud Config Server](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=2.133) [works and how to get one set up, let's look at the other end of the equation,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=4.440692307692308) [the Client.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=9.508) [At its core,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=10.133) [the Config Client is responsible for bootstrapping and](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=11.223909090909089) [fetching application configuration.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=14.133) [So what do I mean when I say that the Config Client is responsible](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=17.133) [for bootstrapping application configuration?](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=20.86633333333332) [Well, when a Spring application starts up,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=22.847285714285718) [it needs to resolve its property sources.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=26.332999999999995) [And it needs to do that very early on in the startup process.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=29.133) [Some of the reasons for that are things like your property placeholders.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=33.133) [When you resolve those,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=37.133) [it needs to actually have the values to resolve the placeholders.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=38.133) [And since the configuration lives on the Configuration Server,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=41.333) [that means that the Config Client needs to fetch the](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=45.04209090909091) [application configuration before the Spring application](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=49.758) [context has even technically started.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=53.508) [If it waited until the application was fully started,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=55.58754545454547) [it would be too late in the process.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=58.933) [There are two different ways that you can get the Config Client](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=62.133) [to bootstrap your application properties,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=65.82530769230769) [and they both use a special file called the bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=67.73300000000002) [properties or the bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=72.79966666666668) [yml.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=75.46633333333337) [The first way is Config First, and you do that by configuring a bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=76.133) [yml or a bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=81.67845454545454) [properties that has the application name,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=83.86027272727273) [as well as the URL to the Configuration Server.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=87.133) [The second way is Discovery First, and that's using service discovery.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=92.133) [So you would configure your bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=96.133) [properties or bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=98.86027272727272) [yml to have the application name and then the location](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=100.22390909090907) [of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=105.44069230769226) [And it would use that to then find the Config Server so](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=108.133) [that it could fetch your configuration.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=111.33299999999998) [Setting up an application to use the Spring Cloud Config Client is even](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=114.133) [easier than setting up the Spring Cloud Config Server.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=118.533) [In your pom.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=122.133) [xml,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=123.633) [you import the spring-cloud-dependencies within the](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=124.133) [dependencyManagement section.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=127.133) [Then within the dependency section, still within your pom.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=128.56157142857143) [xml, define a new dependency on spring-cloud-config-client.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=135.0420909090909) [Then we need to configure how the Config Client](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=140.133) [will bootstrap the configuration.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=142.9022307692309) [If you're using Config First, you define a bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=144.133) [properties or a bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=148.633) [yml.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=150.633) [And you define the spring.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=151.133) [application.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=153.633) [name property, and this is the name of your application.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=154.133) [It will use this when it calls the Spring Cloud Config Server's REST](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=158.3637692307693) [services to find the appropriate configuration.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=163.533) [And then the next property is the spring.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=167.133) [cloud.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=171.133) [config.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=171.633) [uri property, and you would set that to the location of your Config Server.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=172.133) [And in this example I've just used localhost here.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=177.133) [If you're using a Discovery First configuration to bootstrap the Config Client,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=180.133) [the configuration is similar to the one we just looked at,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=184.7996666666667) [but it's slightly different.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=188.43300000000002) [You of course have your bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=189.63300000000007) [properties or your bootstrap.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=191.58754545454548) [yml,](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=193.40572727272735) [and note that I've only included the differences](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=193.86027272727281) [between the Config First configuration.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=197.633) [And that's to define the spring.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=200.133) [cloud.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=203.73299999999998) [config.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=204.33299999999997) [discovery.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=204.93299999999996) [enabled property and setting that to true.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=205.53299999999996) [And you would define that instead of the location of the Config Server.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=208.13300000000007) [You would also need to make sure that you added your](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=212.28684615384626) [Eureka Client dependencies and your pom.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=216.2163333333333) [xml.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=218.71633333333324) [And configure the service URL to the Service Discover Server, and then add the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=0b1ab241-61f6-4a71-8dd2-3cf33f2e4d37&startTime=219.133)

### [Demo: Retrieving Configuration with the Config Client](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee)

[In this demo,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=2.266) [we'll see how to use the Spring Cloud Config Client to retrieve](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=3.1231428571428568) [configuration at startup from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=6.766) [To get started, head on over to start.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=10.266) [spring.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=15.065999999999997) [io.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=15.665999999999997) [For the Group ID, use io.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=16.266) [shultz.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=19.266) [dustin.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=19.766) [For the Artifact name, use config-client-app.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=20.266) [For the dependencies, we're going to want the Config Client,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=23.665999999999997) [of course,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=30.266) [we're going to want Eureka Discovery so that we can use service](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=31.266) [discovery to find the Configuration Server,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=36.86599999999999) [and we'll want the Spring Actuator.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=39.266) [Once you've got everything selected, click the Generate Project button.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=42.266) [That will generate a zip file.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=47.266) [Click on that, unzip it, and head over to your IDE.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=48.980285714285706) [Within IntelliJ or Eclipse,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=52.62963636363636) [right-click on the empty area of the Package Explorer,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=54.44781818181817) [go to Import, search for Existing Maven Projects,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=59.59933333333332) [choose that, click Next, browse to the location of your downloaded zip file,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=64.72054545454546) [mine's in Downloads config-client-app, hit Open,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=71.59933333333332) [and click Finish.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=76.266) [We're going to be using service discovery to locate the](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=77.26599999999999) [Config Server from the Config Client app.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=80.641) [So if you haven't already completed the Service Discovery module,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=83.266) [you'll need to clone the Discovery Server and import it into your IDE.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=87.266) [It's pretty simple.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=91.266) [We'll quickly walk through it.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=92.391) [And if you already have it set up, feel free to skip over this part.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=94.266) [Open up a browser and visit github.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=98.266) [com/dustinschultz/scf-discovery-server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=106.141) [Locate the Clone or download button, and copy the clone URL to your clipboard.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=107.266) [Back within your IDE, make sure the Git Repositories view is showing.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=114.266) [Right-click on the empty area of the Git Repositories view,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=118.266) [and choose Paste Repository Path or URI.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=122.266) [A new dialog box will pop up.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=126.266) [Click Next, choose the master branch, click Next,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=128.41984615384615) [and click Finish to clone the Discovery Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=131.066) [In the Git Repositories view,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=134.266) [right-click on the scf-discovery-server repository](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=137.0437777777777) [and choose Import Maven Projects.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=140.09933333333333) [A new dialog box will pop up, and just click Finish.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=144.266) [Next we need to make a couple of modifications to the Config Server so](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=148.266) [that it will register itself with the Discovery Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=151.266) [Expand the config-server and go to the main application class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=155.266) [Underneath the @EnableConfigServer add an @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=159.266) [Save that, and then open up the application.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=167.266) [properties in the src/main/resources.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=171.93266666666673) [We'll add two different properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=174.266) [The first one is the spring.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=175.26599999999993) [application.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=176.84933333333333) [name, and we're going to set that equal to configserver.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=177.43266666666668) [No spaces.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=183.266) [And then we also want to set the location of the Discovery](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=183.83742857142855) [Server so it knows where to register itself.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=187.266) [So we do eureka.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=190.266) [client.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=195.12314285714288) [server-url.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=196.3374285714286) [defaultZone, and then we set that to localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=197.55171428571433) [Next, expand the config-client-app project,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=207.266) [and open up the main application class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=209.766) [Remember that there's no special annotation that we need to add](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=213.266) [for the Config Client to get its configuration.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=216.016) [As long as the libraries are on the class path and the setup is correct,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=220.266) [it should be able to find the configuration from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=223.65061538461538) [However, we do want to participate in service discovery,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=228.266) [so let's add the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=231.26600000000008) [Go ahead and save that.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=234.516) [Next let's create a new class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=238.266) [So New, Class,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=240.40885714285716) [and we're going to call this class the ConfigClientAppConfiguration class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=241.48028571428574) [Go ahead and click Finish.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=250.266) [Let's go ahead and annotate this with @Component and](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=251.9326666666667) [also @ConfigurationProperties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=257.766) [And we're going to give this a prefix equal to some.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=261.266) [This ConfigurationProperties is going to represent](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=265.266) [our property that's named some.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=269.26600000000013) [property.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=272.59933333333356) [We'll have an instance variable that is a string, so private String.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=273.266) [And the name of it is called property, again, to represent some.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=277.266) [property.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=282.80446153846145) [And make sure that you don't forget the getters and setters.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=283.266) [You can do that by going to Source, Generate Getters and Setters,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=286.266) [choose the property, click OK, and save that file.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=289.266) [Head back to the main application class,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=295.266) [and let's autowire our configuration properties class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=297.81145454545464) [So go in here, we're going to do private ConfigClientAppConfiguration,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=300.35690909090914) [and we'll call this properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=305.266) [And we'll @Autowired it.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=310.266) [You could also use @Inject here.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=313.066) [We'll add another instance variable, private String someOtherProperty,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=317.266) [and we're going to give this an @Value annotation.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=324.266) [And we're going to use the placeholder format to](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=328.266) [inject the someOtherProperty value, so $ curly some.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=331.5387272727274) [other.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=337.1750909090909) [property and end curly.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=337.9932727272727) [Now we're going to add an @RestController annotation](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=341.266) [to the main application class.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=344.3429230769229) [So come up here underneath the @EnableDiscoveryClient,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=346.266) [and you're going to do @RestController.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=350.266) [Go ahead and save that.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=352.99327272727265) [And note that you normally wouldn't put a REST controller](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=355.266) [on your main application class; however,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=358.3429230769232) [since we're just demoing here and we're trying to solidify some concepts,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=360.46599999999995) [it's okay for now.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=365.4882222222223) [We also need to add the handler method, so come down here under main,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=367.266) [do public String printConfig.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=372.266) [And then we're going to annotate this with @RequestMapping.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=375.95830769230764) [In the body of the method,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=384.266) [we're going to construct a string that has the values of](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=385.55171428571435) [each of the configuration properties that were retrieved](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=388.62963636363634) [from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=392.266) [So we're going to need a string builder,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=393.356909090909) [so StringBuilder sb = new StringBuilder.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=396.12314285714285) [And then we're going to say sb.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=401.266) [append.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=403.26599999999996) [And then we're going to get the first value, which is properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=403.55171428571424) [getProperty.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=409.55171428571435) [And then we're going to separate it with a double pipe, so sb.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=410.266) [append, space, ||, space, and then sb.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=415.8374285714288) [append the someOtherProperty value.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=422.266) [And last, we want to return sb.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=426.266) [toString.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=428.9583076923075) [Next, let's go ahead and close both of these files.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=429.3429230769229) [And within the src/main/resources, create a new file called bootstrap.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=434.04377777777773) [properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=440.55171428571435) [Within the bootstrap.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=441.266) [properties, set the spring.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=442.93266666666665) [application.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=445.1548888888888) [name property to the value config-client-app.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=445.71044444444436) [Then we're going to set another property which tells the Config Client](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=449.76599999999996) [to find the Config Server via service discovery,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=456.4478181818181) [so spring.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=462.6660000000001) [cloud.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=464.86600000000016) [config.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=465.9660000000002) [discovery.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=467.0660000000002) [enabled=true.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=468.1660000000002) [We have one last property to set,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=469.266) [and that's the location of the Discovery Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=471.5993333333332) [We've already configured that in the Config Server,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=474.266) [so if you want, you can open up the application.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=476.266) [properties from the config-server, copy the eureka.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=479.6659999999999) [client.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=482.88138461538466) [server URL, and paste that into your bootstrap.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=483.4198461538462) [properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=487.7275384615386) [We can close all of the configuration files and minimize all of the projects.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=488.266) [We're now ready to start running the applications.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=493.266) [We'll start by starting the Discovery Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=497.266) [Navigate to the main application class of the Discovery Server,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=500.266) [right-click on it, Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=504.266) [Once the Discovery Server's started, we'll start the Configuration Server next.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=508.266) [Go to the main application class of the Config Server,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=512.266) [right-click on it, Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=515.266) [And last, we'll start the Config Client.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=521.266) [So go to the main application of the Config Client,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=523.016) [right-click on it, and Run As Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=526.766) [If you expand the console and scroll up,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=531.266) [you'll see that it fetched the configuration from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=534.3429230769228) [So let's open up a browser and visit the Config Client app and see](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=539.266) [that it resolved those configuration values.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=543.266) [In your browser, visit localhost:8080,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=546.266) [and you'll see that it's resolved the configuration values.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=548.766) [The first one, the app specific overridden value is the value from the some.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=552.8659999999999) [property property.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=560.0660000000001) [And remember we set that to this app specific overridden](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=561.266) [value in the Config Client configuration.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=565.1121538461535) [And then the next property, separated by the ||,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=567.766) [the global, is coming from the global properties,](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=571.9326666666665) [the application. properties.](https://app.pluralsight.com/course-player?clipId=ba59682e-02ee-4058-bf22-9148a84b2aee&startTime=575.266)

### [Updating Configuration at Runtime](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c)

[Updating configuration at runtime is easily one of](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=2.166) [the best features of Spring Cloud.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=5.075090909090909) [With it, you can do things like refresh your @ConfigurationProperties at runtime.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=8.166) [You can also use it to update the logging levels on any piece of code.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=13.166) [And the changes happen almost instantaneously.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=17.166) [And the best part is that you can do all of this](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=20.166) [without ever restarting your application.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=23.594571428571417) [So how do you do it?](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=26.166) [Well, the first step is updating your configuration.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=27.88028571428571) [And you do that by cloning the configuration repository](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=30.166) [that your Config Server is looking at, make your changes,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=34.25690909090908) [and then git add, git commit,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=38.49933333333331) [and git push your changes up to the configuration repository.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=40.999333333333325) [From there,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=45.166) [there are several different ways that the](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=45.89327272727273) [application gets the new configuration, both manually and automatically.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=48.4387272727273) [The first way is manually,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=53.166) [and that's by calling the refresh endpoint that's](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=55.24933333333332) [included in the Spring Actuator project.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=58.737428571428566) [And just to be clear,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=62.166) [you would need to do that for every individual service](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=63.59457142857142) [that needs its configuration updated.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=66.83266666666667) [The second way is a combination of both manual and automatic.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=70.166) [And you can imagine that if you had a lot of servers,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=74.166) [calling the refresh endpoint on each of them manually](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=79.166) [could be a pretty painful process.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=82.16599999999995) [Instead, if each of the applications were to subscribe to an event,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=84.52963636363636) [and you were to call the bus/refresh endpoint,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=90.38822222222223) [Spring Cloud Bus would send out a message to all of the subscribers](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=94.41600000000001) [indicating to them that they need to refresh their configuration.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=99.88028571428572) [Now note that there isn't any sort of intelligence in](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=104.166) [whether or not the configuration changed.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=106.47369230769226) [Every subscriber goes and gets its new configuration regardless.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=109.16600000000001) [The third way is just like the second except for it](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=115.166) [adds a level of intelligence.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=119.291) [And the way it does that is you hook it up into your virgin control system,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=121.166) [like Git, and any time you make a commit,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=125.59457142857143) [the changeset of the commit is posted to a monitor endpoint,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=129.45171428571425) [and then that monitor endpoint can determine which services](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=134.666) [need to have their configuration updated.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=139.166) [So let's visualize this.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=142.166) [Imagine that you made a commit to some configuration,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=143.49933333333337) [and you pushed that up to the configuration repository.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=146.766) [And the repository knows what changed,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=152.166) [and it sent that changeset to the monitor endpoint,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=154.66599999999994) [and then it decided that it only needed to notify two of the](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=158.16600000000003) [three applications to update their configuration.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=163.96599999999995) [Regardless of which method you chose to notify your](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=168.166) [applications about configuration updates,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=171.43872727272736) [there's one last step.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=173.166) [And that is to celebrate.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=175.166) [You can brag to your colleagues about making configuration changes on](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=176.8326666666667) [the fly without ever restarting your application.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=180.98418181818187) [And you can do it all at once or even all automatically.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=184.166) [And last, since you used Git,](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=189.166) [you have a full audit log of all of the changes that you've made to your configuration.](https://app.pluralsight.com/course-player?clipId=061e75c8-3dd9-48ca-a45c-015131b1af7c&startTime=191.041)

### [Utilizing the @RefreshScope Annotation](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8)

[We've already talked about how @ConfigurationProperties and logging](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=1.999) [levels will be updated when configuration is refreshed,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=5.999) [but unfortunately that doesn't cover all of the use cases.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=9.999) [Anything that gets its value only at initialization time,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=13.999) [like an @Bean or an @Value, will not be automatically refreshed like the others.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=17.999) [To understand this a little bit better, it helps to see an example.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=24.999) [Suppose you have an @Configuration class,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=28.999) [and it declares a new bean called FooService.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=32.42757142857143) [And to construct FooService,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=36.999) [you need to give it a configuration value from FooProperties,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=38.332333333333345) [which is an argument to the bean method.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=41.999) [And FooProperties is an @Configuration class.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=45.999) [Then you make some configuration changes to the](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=49.999) [properties that are bound to FooProperties,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=52.90809090909094) [and you issue a POST request to the refresh endpoint.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=55.61438461538462) [If you were to look at FooService at this point,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=60.999) [even though you called refresh,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=64.07592307692308) [it would actually still have the old configuration value.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=65.9080909090909) [And that's because it only gets its configuration during initialization.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=69.999) [Here's another example.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=74.999) [Again, we have an @Configuration class,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=76.66566666666667) [and this time we have an @Value annotation that has some](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=79.999) [configuration that needs to be injected.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=84.58233333333338) [And we'll use that configuration as a constructor](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=86.66566666666664) [argument to construct the FooService bean.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=89.7132857142857) [So we go through the same process; we update some configuration,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=93.999) [we POST to the refresh endpoint,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=97.999) [and again we realize that our configuration value is still the old value.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=100.49900000000002) [It did not get updated.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=105.999) [By now you have to be wondering how do I refresh an @Bean or an @Value](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=107.999) [that only gets its configuration during initialization?](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=113.999) [And the answer to that is with the @RefreshScope annotation.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=117.999) [Let's go back to our first example and see how and where we](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=122.999) [utilize the @RefreshScope annotation.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=125.7847142857142) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=128.57042857142858) [all you need to do is add the @RefreshScope annotation to your @Bean.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=131.999) [And once you POST to the refresh endpoint,](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=136.999) [FooService will now see the latest configuration value.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=140.0759230769231) [RefreshScope works just like it sounds.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=143.66566666666662) [It's a hint to Spring that this @Bean or this @Value should be included in the scope of the refresh.](https://app.pluralsight.com/course-player?clipId=97830382-6f88-4576-b09c-c85732ffe5b8&startTime=146.999)

### [Demo: Refresh Configuration Without Restarting Your App](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636)

[In this demo, we'll learn how to refresh our configuration at runtime,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=1.366) [as well as how to use the @RefreshScope annotation.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=6.366) [Before we get started with the demo,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=10.366) [make sure that you have a tool called Postman installed.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=11.865999999999994) [You can get it by going to www.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=15.212153846153845) [getpostman.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=20.135230769230777) [com.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=20.750615384615394) [And we'll use this tool to call the REST endpoints.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=21.366) [It's a nice little REST client.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=25.366) [The first thing we'll do is start all of our applications,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=27.366) [so go ahead and start the Discovery Server,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=31.366) [the Config Server, and the Config Client app.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=34.27509090909093) [I fast forwarded to the point where all of the applications are started.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=36.79457142857142) [Now remember that you need to start them in the correct order.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=40.45690909090909) [So the Discovery Server first, then the Config Server,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=44.36599999999999) [then the Config Client app.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=47.69933333333334) [So if you have any problems with starting them,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=49.366) [make sure that you start them in that order.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=51.4429230769231) [Open up a browser and visit localhost:8080.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=54.366) [And you'll see the configuration values that got](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=58.366) [resolved from the Configuration Server.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=61.442923076923094) [Now, we want to update each of these values,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=63.366) [so we're going to update the first one, the app specific overridden value,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=65.29457142857139) [and the global one.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=69.69933333333337) [So, head back to the IDE.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=71.366) [Back in the IDE, expand the scf-config-repository project,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=74.366) [and open up the config-client-app.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=78.00236363636363) [properties file.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=80.366) [And we're going to change this from the app specific overridden value to coffee.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=81.366) [And then we're also going to set the other one.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=89.366) [We're going to override the some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=91.366) [other.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=93.86600000000003) [property, and we're going to say is good.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=94.2826666666667) [Go ahead and save those.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=98.00236363636364) [Close that file.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=100.72963636363637) [And then we're going to commit those changes,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=102.366) [so right-click on the scf-config-repository,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=104.366) [go to Team, go to Commit, type in a commit message,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=106.00236363636364) [Updating configuration, and click the Commit and Push.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=113.14377777777777) [And it'll pop up a new dialog showing you that it pushed those changes.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=119.366) [Just go ahead and click OK.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=122.366) [And you can exit out of that Git Staging view.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=124.241) [So now we've updated the configuration,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=127.366) [and we've pushed it to the configuration repository.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=129.50885714285715) [And if you go back to your browser and you refresh the page,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=132.366) [the value should still be the old values.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=135.366) [We haven't explicitly asked the application to refresh its configuration.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=138.69933333333327) [In order to do that, start up the Postman application,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=143.366) [and on the New Tab where it says GET, click that drop-down and choose POST.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=146.93742857142863) [Then in the request URL type http://localhost:8080/refresh.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=152.366) [Once you've got that typed in, hit Send,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=160.366) [and the server will respond back with all of the properties that changed.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=162.82753846153858) [So there's an internal property that it has called the config.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=167.366) [client.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=171.69933333333336) [verion, as well as the two other properties that we changed, the some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=172.0326666666667) [other.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=177.03266666666664) [property and the some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=177.58822222222219) [property.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=179.81044444444436) [Head back to your browser and refresh the page.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=180.366) [And ooh, that's interesting.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=183.366) [The first value refreshed for us, we got the coffee value that we set in,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=185.366) [but the second value is still pointing to the global configuration value.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=190.76600000000013) [And the reason for that is that the second value is](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=196.366) [retrieved using the @Value annotation,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=200.59676923076927) [and @Value annotations are not automatically refreshed](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=203.36599999999999) [when you call the refresh endpoint.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=207.79457142857143) [So we can fix that with the @RefreshScope annotation.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=210.366) [Back within the IDE, stop the Config Client app.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=215.366) [Then in the main application class, let's find the someOtherProperty.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=219.366) [So we have here the @Value annotation that gets the some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=224.366) [other.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=228.2945714285715) [property value.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=228.65171428571435) [So to fix our problem of the @Value annotation not updating,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=229.366) [let's add the @RefreshScope to the main application class.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=233.366) [So you type @RefreshScope.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=237.366) [Go ahead and save that and restart the application.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=240.13523076923073) [Now since we restarted the application,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=246.366) [the application's going to fetch the latest](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=248.76600000000005) [configuration values when it starts up.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=251.36600000000004) [So we won't actually be demonstrating the use of @RefreshScope](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=253.366) [because it's going to get the latest value regardless.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=257.0023636363637) [And so what we need to do is we need to update the value again.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=261.366) [So go ahead and open up the config-client-app, and change this some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=265.366) [other.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=270.03266666666667) [property to is really good.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=270.69933333333336) [Save that, close that file out, and again commit that up to the Git repository.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=274.0326666666668) [So Team, Commit, updating configuration again,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=281.366) [and click the Commit and Push button.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=285.5659999999999) [You can exit the Git Staging view.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=289.866) [And head back to your browser and refresh the page.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=293.366) [As you can see, it says coffee is good.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=296.366) [And is good is the value that it retrieved on start up.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=299.1785) [But once we refresh this with the refresh scope now added,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=303.2890769230768) [it will fetch the latest value for that @Value annotation.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=307.75061538461534) [So go ahead and open up Postman, hit the refresh endpoint,](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=312.366) [and you can see it changed the some.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=315.7945714285713) [other.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=318.651714285714) [property.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=319.0088571428568) [Head back to the browser, and refresh that page.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=319.366) [And you can see that it changed our property this time from is good to is really good.](https://app.pluralsight.com/course-player?clipId=41fe5176-9d3b-4895-81e4-648c2bcba636&startTime=321.59676923076927)

### [Encrypting and Decrypting Sensitive Configuration](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282)

[Spring Cloud Config Server also provides additional useful](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=1.499) [functionality for encrypting and decrypting your configuration.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=5.499) [It has support for several different features.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=10.499) [It supports encrypted configuration at rest or in-flight.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=13.499) [And at rest,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=17.499) [that simply just means that your configuration is](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=18.58990909090909) [encrypted when it's stored on disc.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=21.499) [And in-flight means that it's encrypted as it travels between](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=23.68081818181818) [the Config Server and the Config Client.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=27.582333333333338) [It has utility endpoints for encrypting and decrypting your configuration.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=30.499) [And one really important thing to point out is that by default](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=35.499) [neither of these endpoints are secured unless you configure](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=40.114384615384644) [security for your Configuration Server.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=44.19130769230768) [And we've already talked about how to secure your Config Server.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=46.499) [And remember that any of the methods that are supported by Spring](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=50.499) [Security will also work for securing your Config Server.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=53.499) [And last,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=58.499) [it has support for encrypting and decrypting using](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=59.40809090909091) [either symmetric or asymmetric keys.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=63.044454545454535) [So you can choose whatever works best for your situation.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=64.95354545454545) [Before we get into the details on encrypting and decrypting configuration,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=70.499) [I thought it would be useful to see how encrypted configuration looks.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=73.96053846153846) [I've included both an application.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=79.499) [properties and an application.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=81.999) [yml.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=83.999) [And they both have the same encrypted database password.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=84.499) [Notice that before the random letters and numbers](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=89.499) [there's a special value of cipher, and it's surrounded by curly braces.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=92.40809090909087) [This is what denotes that the real value is an encrypted value.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=98.499) [And notice that there's one minor difference in the application.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=103.499) [yml versus the properties.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=107.13536363636359) [The YAML file requires us to surround the value in single quotes,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=108.86263636363635) [whereas the properties file does not.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=114.499) [Now that you've seen what encrypted configuration looks like,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=117.499) [you're probably wondering at what point is the configuration decrypted?](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=120.499) [And there are two different options.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=125.499) [The first option is upon request, and that's at the Configuration Server.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=127.13536363636359) [So you make a request for configuration for a specific application,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=132.499) [and the Config Server decrypts the values in the](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=137.499) [configuration before sending it back.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=140.77172727272736) [You'd only want to use this if the connection between your](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=142.49900000000002) [Config Server and your Config Client is secure.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=146.499) [If it's not,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=150.499) [you can utilize the second option that decrypts the value's client side.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=151.249) [And this is exactly opposite of the first option.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=154.74899999999997) [Instead of decrypting the values before sending them back,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=158.499) [the Config Server sends them in encrypted format,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=162.499) [and the client is responsible for decrypting them.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=165.16566666666674) [Note that the default way is the first option, upon request.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=168.31718181818187) [And if you want the client to decrypt the configuration,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=173.03746153846154) [you have to set a property on the Config Server,](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=176.86263636363637) [spring.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=180.499) [cloud.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=181.13536363636362) [config.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=181.77172727272725) [server.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=182.40809090909087) [encrypt.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=183.0444545454545) [enabled, that's a big one, =false.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=183.68081818181813) [And that will tell the Config Server not to decrypt the values before sending them back to the client.](https://app.pluralsight.com/course-player?clipId=27c9c360-72ef-492f-80c7-9d8f8797f282&startTime=187.499)

### [Using the Encryption and Decryption Support](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640)

[Before we get into the details about configuring our Configuration](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=1) [Server for encryption and decryption support,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=5.966) [note that it assumes we have the Java Cryptography Extension installed,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=8.693272727272726) [or commonly referred to as JCE.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=14.299333333333331) [And if you've never installed JCE or you just can't remember how to do it,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=17.11984615384615) [I've detailed the instructions out on the course page at my website at dustin.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=22.216) [schultz.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=30.966) [io/ps-scf.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=31.966) [That's Pluralsight Spring Cloud Fundamentals.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=32.966) [The first step to encrypting your configuration is to choose the key type,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=35.966) [and that could be either symmetric or asymmetric.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=40.52155555555556) [And typically symmetric keys are easier to use,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=44.966) [but less secure than asymmetric keys.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=48.394571428571446) [And you can choose whatever works best for your situation.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=50.966) [Step two, if you're using a symmetric key, is to configure the encryption key.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=55) [And you can do that in the application.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=60.966) [properties or the application.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=64.04292307692309) [yml.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=65.58138461538464) [And the property that is set is encrypt.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=65.966) [key.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=69.52155555555554) [And you would set that to the secret value you'll](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=69.966) [use to encrypt your configuration.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=73.96600000000005) [Step two, if you're using asymmetric keys, can be done in two different ways.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=75.966) [The first way is to set the value of the encrypt.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=80.966) [key property in the application.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=85.36600000000006) [properties or the application.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=87.966) [yml as a pem\_encoded\_key\_as\_text.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=91.966) [And the PEM encoded key would contain both the public and the private key.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=95.966) [The second way, if you're using asymmetric keys, is to use the Java KeyStore.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=101.966) [Once you've created or imported your public and private](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=107.966) [key into an existing or new keystore,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=110.96599999999995) [you simply configure the location of the keystore,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=113.7841818181818) [the password to the keystore,](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=117.38266666666667) [and the name of the alias that you chose when creating or](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=119.46600000000002) [importing the key into the keystore.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=124.46600000000002) [And you can do that in the application.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=126.966) [properties, of course, or in the application. yml.](https://app.pluralsight.com/course-player?clipId=6095cd63-44b4-407b-88b9-60bd78b2c640&startTime=129.87509090909094)

### [Encrypt and Decrypt REST Endpoints](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe)

[Once you have your Config Server all set up for cryptography,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=2.133) [you can utilize some of the utility REST endpoints to encrypt and decrypt](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=5.133) [values that you will put or take out of your configuration.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=10.549666666666665) [Both of the endpoints are really, really easy to use.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=15.133) [The first one is the encrypt endpoint,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=18.133) [and you'd use this to generate the encrypted values](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=20.825307692307682) [that you'll use in your configuration.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=24.466333333333328) [And it's really simple to use, like I said.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=27.133) [All you do is send a POST request to the /encrypt endpoint,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=30.133) [and you pass the value that you want to encrypt as the body of the request.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=35.133) [The Config Server will use its configured key,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=40.133) [either the symmetric or the asymmetric key,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=42.79966666666669) [to encrypt that value.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=45.418714285714294) [And again, I can't stress this enough,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=47.133) [make sure that this endpoint is secure using Spring](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=49.82530769230771) [Security or any other means to ensure that this endpoint is](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=53.633) [only accessed by authorized users.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=59.56157142857143) [The decrypt endpoint is literally almost identical to the encrypt](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=63.133) [endpoint with the exception of the name and the inputs.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=67.133) [And you'd mainly use this for debugging purposes.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=71.133) [So to decrypt a value, you would POST to /decrypt,](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=74.133) [and you would send the encrypted value as the body of the request, and it would return to you the unencrypted value.](https://app.pluralsight.com/course-player?clipId=6d0f26f1-88de-4e19-89c9-5ac7061b8dbe&startTime=77.70442857142861)

### [Summary](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c)

[We've reached the end of this module,](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=1.233) [so let's take a moment to review what we've learned.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=3.232999999999999) [We've covered a lot of topics.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=6.232999999999999) [We first talked about the need for a Configuration Server in a](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=8.233) [cloud environment to manage the explosion of configuration that](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=11.00223076923076) [comes with managing a distributed system.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=14.433000000000003) [Then,](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=16.323909090909094) [we saw how to configure the Spring Cloud Config Server to serve](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=16.596636363636367) [our configuration files and how to use the Spring Cloud Config](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=20.733000000000008) [Client along with the bootstrap.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=25.505727272727267) [properties or the bootstrap.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=27.778454545454533) [yml to retrieve the configuration during application initialization.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=29.86936363636364) [After that,](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=34.233) [we saw how we could brag to our colleagues about updating](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=34.84838461538461) [our configuration at runtime without ever needing to](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=38.233) [restart our application server.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=41.56633333333331) [We also saw what gets automatically refreshed and what](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=43.233) [requires an @RefreshScope annotation.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=46.5057272727273) [And last,](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=48.1420909090909) [we finished out the module with a section on how to utilize the encryption and decryption support within Spring Cloud Config.](https://app.pluralsight.com/course-player?clipId=70c4b3db-9a16-4499-a5be-80dd9cf0f49c&startTime=49.05118181818181)

## [Mapping Services Using Intelligent Routing](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee)

### [What Is Intelligent Routing?](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee)

[Hi, my name's Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=0) [and in this module we'll learn how to map our services in](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=1.9230769230769231) [the cloud using Intelligent Routing.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=7.666666666666668) [We'll begin by talking about what Intelligent Routing is](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=11) [and what problem it solves for us.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=13.45454545454546) [Then we'll introduce Netflix Zuul as part of the Spring Cloud Netflix project.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=15.66666666666667) [And we'll see how to set up a proxy server,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=19.714285714285708) [how to configure different routes, and how to set up filtering.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=22.92307692307692) [Remember that in order to be as dynamic and as scalable as possible,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=28) [a cloud-native system is made up of individually deployable services,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=32) [which together, as a whole, form an overall system.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=37) [With that comes some challenges though.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=41) [Each of the individual services may be running on a different port,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=42.79999999999998) [a different address, or a combination of both.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=46.909090909090935) [And they'll also likely have different paths and](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=49.818181818181834) [different APIs to interact with.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=53.14285714285714) [And as a user or a client of those services,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=56) [such as a mobile app or a web app,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=59.125) [interacting with each of the individual services,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=62.199999999999996) [which could easily be in the double or triple digits,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=65) [would be a nightmare.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=68.57142857142861) [Instead,](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=70) [we can use Intelligent Routing to make our application](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=70.45454545454545) [appear as if it were a single system.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=74.54545454545453) [Similar to how a completed puzzle appears as if it were a whole, but it's made up of several different individual pieces.](https://app.pluralsight.com/course-player?clipId=e6c8a254-8637-47e6-b2c6-5be123bf58ee&startTime=77.69230769230771)

### [Intelligent Routing via a Gateway Service](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b)

[Routing is typically implemented via something called a gateway service,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=2.275) [or an API Gateway.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=6.675000000000001) [And an API Gateway, or a gateway service,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=8.275) [is defined as the single point of entry for all clients.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=11.967307692307694) [So in many ways the gateway service is a lot like the front door to our system.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=17.275) [And each of the individual services is then located behind this door,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=22.275) [and all the requests must enter through it.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=27.275) [A gateway service not only provides dynamic routing and delivery,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=30.275) [which means at runtime it can decide where it should route a](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=35.275) [request and if it should even route a request at all,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=38.96730769230768) [but it also provides an array of other functionalities.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=41.941666666666656) [One of those pieces of functionality is security.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=45.275) [It provides the ability to authenticate all of the incoming requests,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=49.275) [as well as filter out any sort of illegitimate or bad request.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=54.275) [And it's actually a really good candidate for providing](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=59.275) [auditing and logging of requests since all of the requests](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=62.5477272727273) [must enter through the gateway.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=66.35192307692309) [It also provides something called request enhancement,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=68.275) [which is just a fancy way of saying that it can add](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=70.82045454545452) [additional information to the request, or enrich the request,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=74.275) [if you will.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=77.775) [A concrete example of this is the way Netflix uses their gateway.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=79.275) [They use their gateway service to do a geolocation](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=83.275) [lookup for all incoming requests,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=86.27499999999996) [and they add that additional information as an additional request header](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=88.275) [so that it's available for all downstream services.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=93.63863636363637) [The gateway service can also act as a load balancer for the](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=97.275) [individual services that are behind it.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=100.96730769230768) [Another interesting feature of the gateway service is the ability](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=103.27500000000003) [to provide different APIs for different clients.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=107.35833333333336) [APIs are not a one-size-fits-all kind of thing,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=110.275) [and different clients, such as web clients or mobile clients,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=113.18409090909088) [have different needs in the way they call your APIs.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=116.96730769230771) [So, for instance,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=120.70357142857145) [it may be okay for a web client to interact with several](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=121.77500000000003) [endpoints to accomplish some piece of functionality,](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=126.0931818181818) [but the same may not be true for a mobile client, which may be better served with just a single endpoint.](https://app.pluralsight.com/course-player?clipId=5e10cfc1-0b9f-419a-9c42-8cd9db91ea9b&startTime=128.62708333333333)

### [Using Netflix Zuul with Spring Cloud](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf)

[Intelligent Routing is implemented using a combination of](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=2) [Spring Cloud and a project from Netflix.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=5.7136) [The project is called Netflix Zuul, and it's pronounced zool,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=9.642) [which rhymes with the word tool.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=13.642) [The project page for the Netflix Zuul project defines it as a](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=15.642) [gateway service that provides dynamic routing,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=20.2573846153846) [monitoring, resiliency, security, and more.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=24.213428571428576) [And the name Zuul is actually a pretty good name as Zuul refers to a fictional,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=26.79584615384615) [monster-like character in the movie Ghostbusters that's the](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=32.82381818181819) [gatekeeper just like a gateway service is the gatekeeper.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=36.39200000000001) [We'll talk about how you go about adding Spring](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=41.642) [Cloud and Netflix Zuul to a project, and then we'll follow up with a live demo.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=44.41123076923076) [Just like all of the other Spring Cloud projects,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=49.642) [adding Spring Cloud and Netflix Zuul to your project is really,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=51.892) [really easy.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=56.642) [In the dependencyManagement section of the pom.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=57.642) [xml, define a new dependency with a scope of import on spring-cloud-dependencies.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=60.823818181818176) [And still within the pom.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=68.642) [xml,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=70.30866666666664) [define a new dependency in the dependency section on spring-cloud-starter-zuul.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=70.64199999999997) [Then, in your main Application class, add the @EnableZuulProxy annotation,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=76.642) [and this is the annotation that turns your application into the gateway service.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=82.042) [From a configuration standpoint, you have two different options.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=87.642) [You can configure your gateway service to use service discovery or](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=90.642) [you can configure it without service discovery.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=94.30866666666661) [If you're using service discovery,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=97.642) [define the usual parameters for the name of the application and](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=99.4601818181818) [the location of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=103.72533333333335) [If you're not using service discovery, you still define the application name,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=106.642) [and you add an additional parameter, ribbon.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=111.09654545454546) [eureka.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=116.1874545454546) [enabled=false.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=116.91472727272733) [Remember how I mentioned that the gateway service can serve](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=117.642) [as a load balancer for your services?](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=120.71892307692306) [Well,](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=123.09654545454543) [the name of the client-side load balancer project from Netflix is called Ribbon.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=123.4601818181818) [And we'll get into more details about what Ribbon is in the module on client-side load balancing.](https://app.pluralsight.com/course-player?clipId=6ad6de79-35b6-4bc1-b634-15509cd38eaf&startTime=128.642)

### [Configuring Routes in Netflix Zuul](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095)

[Once you have everything configured,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=2.009) [the next step is to define how Zuul should route requests.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=3.259) [The default routing behavior when Zuul is set up using service](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=7.009) [discovery is to route requests by service name.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=11.009) [So for example, if you requested /foo,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=15.009) [Zuul would use service discovery to find the service with a name](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=18.190818181818177) [of foo and send that request to that service.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=22.86614285714286) [Here's another example.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=26.09990909090909) [If you were to request /categories/1,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=27.19081818181818) [Zuul would locate the service with the name categories,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=29.609) [and it would send the /1 request to that service.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=35.009) [By default, the prefix is stripped from the request,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=39.009) [so the service actually only gets the /1 part of the request.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=42.75899999999998) [If you wanted it to send the full request,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=47.009) [the /categories/1, you could set the property zuul.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=51.09990909090908) [stripPrefix to false, and the service would get the request /categories/1.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=54.508999999999986) [Also note that all services are added by default,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=59.28172727272727) [so you'll want to use the zuul.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=63.64536363636364) [ignoredServices, and you could set that to a pattern to ignore specific services.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=67.46354545454547) [In addition to the default configuration,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=73.009) [you can also define more precise configuration for specific services.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=74.6453636363636) [First you define the path with the zuul.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=80.009) [routes.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=84.37263636363637) [route\_name.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=84.91809090909092) [path property where the route name can be anything you want.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=85.46354545454547) [And the path is defined as a path that's using the Ant-style matchers.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=91.009) [Then you define the same property prefix,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=97.009) [but end it with service\_id instead of path.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=99.9256666666667) [And the service ID is the service identifier that Zuul will look for](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=103.25900000000001) [when discovering the service via service discovery.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=108.82718181818181) [You'll also need to set the zuul.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=112.009) [ignored-services property so that Zuul doesn't try to](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=114.55445454545452) [automatically add a route for that service ID.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=117.67566666666669) [The configuration for when you're not using service discovery](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=121.009) [is actually pretty similar to when you are.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=124.60900000000005) [You define the path, just like you did in the previous configuration,](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=127.55445454545452) [and then instead of defining a service ID, you simply define the URL to the service.](https://app.pluralsight.com/course-player?clipId=a0e417fc-df19-4fdd-a658-921f3587a095&startTime=131.67566666666673)

### [Demo: Using Netflix Zuul as an Intelligent Router](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48)

[Head on over to start.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=2.142) [spring.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=4.065076923076923) [io, and we're going to create three different projects here.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=4.449692307692308) [So for the Group ID do io.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=8.642) [schultz.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=12.142) [dustin, and for the Artifact, the first one we're going to create,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=12.642) [we're going to say gateway-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=16.142) [For the dependencies, we'll want to add Zuul,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=18.642) [and then we'll also want to add Eureka Discovery.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=21.927714285714288) [And once you're finished there, go ahead and click Generate Project,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=25.142) [and that will create a zip file for you.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=28.142) [And still on the same page,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=31.14199999999999) [clear the dependencies and change the Artifact to hello-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=33.142) [And for the dependencies, we'll want to add Web and Eureka Discovery.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=40.142) [Go ahead and click Generate Project, and that will create a hello-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=45.142) [zip.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=49.757384615384645) [And leave everything the same, but change this from hello to goodbye.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=50.142) [So we're going to have a hello and a goodbye-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=56.142) [And click Generate Project.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=58.142) [Go ahead and unzip all of those zip files and head over to your IDE.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=59.68046153846155) [Within your IDE, right-click on the empty space in the Package Explorer,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=65.142) [and go to Import, and choose Existing Maven Projects.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=69.642) [Navigate to the location of the downloaded zip files,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=74.142) [we'll use the gateway-service first, and click Open,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=77.89200000000004) [and click Finish.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=81.642) [And that imports the project into our IDE,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=83.142) [and you'll need to do the same for the other two services.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=85.42771428571433) [I fast forwarded to the point where I have all of the services imported.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=89.44969230769232) [We're also going to need the Service Discovery Server,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=93.75738461538458) [so if you don't already have that imported into your IDE](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=96.23290909090908) [from completing the previous modules,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=100.23290909090908) [I'll quickly show you how you can import it.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=102.05109090909087) [Go ahead and right-click on the empty area of the Package Explorer,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=104.85628571428575) [and go to New, and choose Other.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=108.59654545454543) [In the textbox, go ahead and start typing maven,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=111.142) [and choose the option that says Check out Maven Projects from SCM.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=113.91123076923076) [Click Next.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=119.142) [We'll need to grab the git clone URL from GitHub,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=119.80866666666665) [so go ahead and fire up a browser and visit github.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=123.142) [com/dustinschultz/scf-discovery-server.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=132.892) [On the GitHub page, locate the Clone or download button,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=134.142) [click it, and highlight the clone URL.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=138.30866666666657) [Copy that to your clipboard and head back to the IDE.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=140.8086666666667) [In the textbox under the SCM URL, go ahead and paste that and click Next,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=145.142) [and click Finish.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=149.52661538461538) [We now have everything we need to get started.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=150.68046153846154) [Go ahead and expand the gateway-service project,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=154.142) [and locate the main application class.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=157.37276923076917) [In the main application class, we're going to add two annotations.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=160.142) [The first one is the @EnableZuulProxy annotation,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=164.142) [and the second one is the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=167.96018181818172) [Next, we'll open up the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=173.25311111111108) [properties and configure the properties for the gateway service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=177.542) [So go ahead and expand src/main/resources and open the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=181.142) [properties.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=186.59654545454532) [The first property we're going to add is the spring.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=187.142) [application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=191.30866666666657) [name property, and we're going to set that to gateway-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=191.72533333333323) [And then the other property we'll need is the location](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=197.142) [of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=200.47533333333342) [So we'll say eureka.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=202.142) [client.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=205.05109090909087) [service-url.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=205.7783636363636) [defaultZone, and then we'll set that to localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=206.5056363636363) [Next,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=212.32381818181815) [you can go ahead and close both of those files and](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=213.05109090909087) [minimize the gateway-service project.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=220.142) [Next, we're going to open up the hello-service project,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=222.142) [so go ahead and expand that, and open up the main application class.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=225.14200000000008) [In the main application class,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=229.142) [we're going to add the @EnableDiscoveryClient annotation,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=230.64200000000005) [and we're also going to make this a RestController.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=233.23290909090906) [Now this is normally a bad idea if you were to do this in a real application,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=238.142) [but we're just doing this as a simple example so it's okay for now.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=242.55866666666665) [So we'll go ahead and add @RestController.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=248.642) [Go ahead and save that.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=252.142) [And then we'll need a handler method, so public String hello.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=253.8086666666667) [And this is just going to return Hello!, and we'll](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=259.47533333333325) [annotate this with @RequestMapping.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=267.8086666666666) [Now we need to configure our hello-service application,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=271.142) [so go ahead and open up src/main/resources and open up the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=273.323818181818) [properties.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=279.5420000000002) [In the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=280.142) [properties, the first property we'll set is the spring.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=280.96018181818175) [application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=283.8086666666667) [name, and we'll set this to hello.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=284.47533333333337) [And we're also going to set the server port.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=289.142) [Since we have multiple applications running at the same time,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=291.142) [we don't want their ports to conflict.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=294.142) [So we'll say server.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=296.4753333333332) [port, and we'll set this to 1111.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=297.80866666666645) [Go ahead and save that.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=301.41472727272736) [And then the last property is setting the location](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=304.142) [of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=307.3562857142855) [And we can go ahead and just copy that from the gateway service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=309.142) [So open up the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=313.142) [properties from the gateway service,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=315.1419999999999) [copy the configuration value that's setting the](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=317.142) [location of the Service Discovery Server,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=319.2420000000001) [close that, and then paste that into your application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=321.52661538461535) [properties.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=325.68046153846143) [You're going to repeat basically the same process for the](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=326.142) [goodbye-service except for all of the locations that it](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=328.142) [says hello will be goodbye.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=332.23290909090895) [And instead of using all 1s for the port, we'll use all 2s.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=334.4545) [I fast forwarded to the completed goodbye-service,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=340.142) [so let's take a look at the main application class.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=342.6874545454546) [We have the @EnableDiscoveryClient annotation and](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=347.142) [the @RestController annotation, and then we have one handler method,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=349.94199999999995) [which is goodbye, and it's annotated with the @RequestMapping.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=354.2329090909091) [In the application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=359.142) [properties, we have the spring.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=360.5056363636363) [application.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=362.7783636363635) [name set to goodbye and the server.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=363.23290909090895) [port set to all 2s.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=366.642) [And then the configuration for the Service Discovery Server is exactly the same.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=369.142) [We're now ready to start up all of the applications and try them out.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=374.142) [So go ahead and close these files and collapse the goodbye-service.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=378.142) [Open up the discovery-server service as this is the](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=383.142) [first application we'll start.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=385.9112307692309) [So right-click on that, go to Run As, choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=387.142) [After that, we'll go ahead and start the gateway service,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=392.142) [so right-click on the main application of the gateway service,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=395.142) [go to Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=399.142) [And then we can start the goodbye-service next,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=401.29584615384624) [so expand the goodbye-service, and right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=404.142) [Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=409.642) [And last, we can start the hello-service application,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=412.142) [so right-click on its main application class,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=415.142) [Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=418.642) [And just to confirm that you have all of the applications started,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=421.142) [you can click this little drop-down arrow,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=425.142) [and you'll see each of the individual services that you have running.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=427.29584615384624) [Let's open up a browser and try things out.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=432.142) [In your browser, visit localhost:8080/hello.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=435.142) [And, as you can see, it returned the Hello!](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=441.142) [string.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=443.8420000000001) [And just to confirm, we'll also hit the goodbye endpoint.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=444.142) [And, as expected, it returned the Goodbye!](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=448.142) [string.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=450.767) [Now these examples are very simplistic, but a lot is going on in the background.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=451.142) [When we visited localhost:8080/goodbye,](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=457.142) [the gateway service looked up a service with the name goodbye from the](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=459.80866666666674) [Service Discovery Server and then proxied the traffic to that service and then proxied the response back to the browser.](https://app.pluralsight.com/course-player?clipId=bbede2e4-1721-4339-9f1f-48d8d6d20e48&startTime=467.142)

### [Creating Filters with Netflix Zuul & Spring Cloud](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be)

[One of the key features in Netflix Zuul is the ability to define filters.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=1.909) [Filters allow you to intercept and control the requests and](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=6.909) [the responses that pass through the gateway.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=11.45445454545455) [Zuul has support for several different types of filters.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=14.909) [The first one is the pre type filter,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=17.909) [which is executed before the request is routed.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=20.985923076923065) [Next comes the route type filter,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=24.159000000000002) [which allows you to direct the request in any way you want.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=26.65900000000001) [In fact,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=31.123285714285718) [earlier when we defined the @EnableZuulProxy](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=31.837571428571433) [annotation on the main application class,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=34.90899999999999) [we were telling Spring to set up some predefined route filters](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=38.909) [to proxy our request to back-end services.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=43.492333333333306) [After route comes the post filters, and,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=46.63627272727272) [as the name suggests, these filters are executed after the request is routed.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=49.818090909090905) [And the last one is the error filter type.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=55.139769230769225) [The error filter type is responsible for handling when](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=57.909) [any of the previous filter types, the pre,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=61.65899999999998) [route, or posts, results in an error.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=65.409) [To define a Zuul filter, you simply extend and implement the ZuulFilter class.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=68.909) [And there are four different methods to implement.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=74.909) [The first is the run method, and this is where the main logic of the filter goes.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=77.909) [Note that it returns an object,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=83.909) [but the current implementation ignores it so you can just](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=86.63627272727273) [simply return null from this method.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=90.7271818181818) [The next method is the shouldFilter method,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=92.909) [and, as the name suggests,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=95.2423333333333) [this method allows you to return true or false indicating](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=96.909) [whether or not the filter should be ran.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=101.07566666666672) [The third method is the filterType method,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=103.90899999999998) [and here you can define one of the four predefined values,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=106.409) [either pre, route, post, or error.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=111.909) [The last method is the filterOrder method,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=114.909) [and this allows you to control the execution of your Zuul filters.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=118.37053846153847) [The RequestContext is an object that's responsible for holding the request,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=123.909) [the response,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=129.32566666666665) [and any state or data information that needs to be](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=130.15899999999996) [shared between all of the filters.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=134.26614285714285) [So you'd use it to get access to the HttpServletRequest or Response,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=136.40900000000002) [as well as use it to set or get data for or from other filters.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=141.409) [The RequestContext is unique to every request and only](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=148.909) [lasts the duration of the request.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=153.24233333333336) [Once you've defined and implemented your Zuul filter,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=155.909) [you need to tell Spring about it.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=157.909) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=160.2726363636364) [create a method that returns the Zuul filter and annotate it with @Bean. Spring Cloud Netflix will pick up and add any beans of type ZuulFilter to Zuul.](https://app.pluralsight.com/course-player?clipId=12b91209-09b4-4e74-b519-fd3ed91fa2be&startTime=162.09081818181826)

### [Demo: Creating and Using a ZuulFilter](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f)

[In this demo,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=1.842) [we'll learn how to implement a Zuul filter to add an](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=2.699142857142857) [additional header to the incoming request so that it's](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=5.842) [available for downstream services to consume.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=9.932909090909094) [We'll start from where we left off in the previous demo.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=12.175333333333336) [And remember that we had four different services.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=15.93290909090909) [We had the discovery-server that was doing service discovery,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=18.842) [we had the gateway-service, which was our edge service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=22.842) [and then we had two application services,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=25.092) [the goodbye-service and the hello-service.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=28.064222222222227) [Since we're building a filter, we'll start off in the gateway-service.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=30.842) [So go ahead and expand the gateway-service and create a new package.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=34.842) [So go ahead and New, Package, and we'll call this io.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=39.842) [schultz.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=46.12771428571426) [dustin.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=46.69914285714283) [filters.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=47.2705714285714) [And within that new package create a new class,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=47.842) [so New, Class, and we'll call this AddRequestHeaderFilter.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=51.59199999999998) [And remember that we have to extend the ZuulFilter class,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=58.842) [so the superclass for our class will be ZuulFilter.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=62.842) [For the first method, the shouldFilter method,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=68.842) [let's go ahead and change that from return false to return true.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=70.75109090909086) [We're always going to apply this filter.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=75.842) [And let's skip over the run method for right now and go down to the filterType.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=77.45738461538458) [And this particular filter we're going to create a pre filter,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=81.842) [so we can say return pre.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=86.842) [And then for the filterOrder, return 0 is okay,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=88.98485714285717) [so we'll just leave that the same.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=92.0562857142857) [In order to get access to the request to add headers to it,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=93.55628571428566) [we need to get access to the RequestContext.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=97.64200000000004) [So let's clear this TODO and say RequestContext ctx = RequestContext.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=100.842) [getCurrentContext.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=109.092) [And within the RequestContext there's the addZuulRequestHeader method.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=109.842) [And image that our use case is to add the location of the incoming request,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=115.842) [so we'll name this header x-location.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=121.41342857142857) [And we're going to mock this; we'll say that every request comes from USA.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=124.842) [And then last,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=130.842) [remember that the return value is not actually used](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=131.76507692307698) [in the current implementation,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=134.53430769230786) [so returning null is going to be okay for our purposes.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=135.9134285714286) [Let's close this file and open up our main application class.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=139.842) [And within our main application class, we'll annotate this with @Configuration.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=143.842) [And then we're going to want to define the](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=150.842) [AddRequestHeaderFilter as an @Bean here,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=154.11472727272738) [so we'll say public AddRequestHeaderFilter,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=158.217) [and we're going to return a new AddRequestHeaderFilter.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=163.842) [And again, make sure we annotate this with @Bean.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=168.842) [And that's all the changes that we need to make to the gateway-service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=172.842) [so let's go ahead and close this and collapse the gateway-service.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=175.342) [And then let's go ahead and open up the hello-service and](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=180.842) [open up the main application class.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=183.19914285714296) [In our handler method, we're going to add a new parameter.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=184.9134285714286) [We're going to say String location.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=188.842) [And we're going to annotate this with @RequestHeader,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=190.84200000000007) [and then we're going to give it the name of that request header](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=193.76507692307692) [that the gateway-service is adding to the request,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=199.64200000000002) [which is x-location.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=202.842) [And then we'll modify the string to say Hello from location,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=204.59200000000004) [and go ahead and save that.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=211.592) [And that's all the changes that we need to make to](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=216.842) [our application for this demo.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=219.592) [So we can go ahead and close this and minimize the hello-service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=220.842) [and we're ready to start things up.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=224.842) [So we'll want to start the discovery-server first.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=227.1753333333334) [So expand the discovery-server, locate the main application class,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=229.842) [right-click, Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=233.842) [After that, we'll start the gateway-service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=237.1147272727272) [so collapse that and open the gateway-service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=240.342) [highlight the main application class, Run As,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=243.842) [Spring Boot App.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=247.342) [And then last, let's start up the hello-service.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=248.842) [So collapse the gateway-service, head over to the hello-service,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=250.842) [right-click, Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=254.842) [Next, start up your browser and visit localhost:8080/hello.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=259.842) [And there we have it.](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=265.842) [We have the Hello and then we have the USA,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=267.17533333333324) [which came from the gateway-service, which added it as a request header,](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=269.842) [which the hello-service then consumed and appended to it's Hello string to come out with the string Hello from USA!](https://app.pluralsight.com/course-player?clipId=a98e1463-d581-4d62-a937-b7edf5f8d67f&startTime=274.342)

### [Summary](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e)

[We've now completed the module,](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=1.475) [so let's take a quick moment to recap what we've learned.](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=3.013461538461538) [First,](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=6.56590909090909) [we looked at the reasons why Intelligent Routing is needed in](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=6.929545454545453) [the first place and why it's important.](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=10.929545454545453) [Then we looked at how routing is implemented via an API Gateway,](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=13.475) [or a gateway service.](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=18.475) [And last,](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=19.80833333333333) [we saw how we can use Netflix Zuul as a gateway service to route and filter our requests and responses to and from back-end services.](https://app.pluralsight.com/course-player?clipId=0324a511-5d2f-495d-b037-863fc426942e&startTime=20.474999999999994)

## [Calling Services Using Client-side Load Balancing](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2)

### [Module Introduction](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2)

[Hi, my name's Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=0) [and in this module we'll learn how to utilize client-side](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=1.9230769230769231) [load balancing to distribute the workload of a service in](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=5.800000000000001) [a cloud-native application.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=10.600000000000001) [We'll start off with what is load balancing,](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=13) [and what role does it play in a cloud-native application?](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=15.461538461538467) [Then we'll talk about traditional server-side load balancing,](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=18.999999999999993) [which you're probably already familiar with.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=22.66666666666667) [Then we'll introduce client-side load balancing,](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=26) [what it is and how it differs from server-side load balancing.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=27.999999999999993) [Next,](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=32.222222222222214) [we'll introduce Netflix Ribbon and how we can utilize it with Spring](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=32.66666666666666) [Cloud to implement client-side load balancing.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=37.00000000000002) [We'll learn how to implement it with and without service](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=39.0909090909091) [discovery using two new annotations: the @LoadBalanced](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=43.14285714285714) [annotation and the @RibbonClient annotation.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=47.71428571428571) [We'll finish off the module with a section on how to customize](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=52) [Ribbon's configuration for things like different load balancing](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=55) [algorithms or different ways to check the health of a service before sending a request to it.](https://app.pluralsight.com/course-player?clipId=1c19c33f-4224-41b3-b7a1-29a39ec540b2&startTime=59)

### [Client-side vs. Server-side Load Balancing](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4)

[So what is load balancing?](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=1.8) [Simply put,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=3.8) [load balancing is a way to improve the distribution of](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=4.3) [workload across multiple computing resources.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=6.8) [And you probably already knew that,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=10.8) [so the more important question is what role does load](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=12.800000000000004) [balancing play in a cloud-native architecture?](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=16.8) [And the answer to that is actually a very important one,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=19.8) [probably even more important than in a non-cloud-native architecture.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=22.8) [And the reason for that becomes clearer when you look at](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=26.8) [the differences in the architecture.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=29.55) [In a non-cloud-native application,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=32.8) [you go from having multiple instances of a single application](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=34.13333333333334) [with a single load balancer to multiple services with multiple](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=38.07272727272726) [instances and multiple load balancers.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=43.466666666666654) [And you can start to see the importance of a load balancer](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=46.8) [just by the sheer number of load balancers that we need in](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=49.20000000000003) [a cloud-native application.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=54.3) [There are typically two different types of load balancers.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=55.8) [There's the server-side load balancer where the server is](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=57.8) [responsible for the distribution of the load,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=61.399999999999984) [and there's the client-side load balancer where the caller is](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=63.9818181818182) [responsible for the distribution of the load.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=67.46666666666664) [Let's take a look at each of these in a bit more detail.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=69.8) [With server-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=73.8) [a request to another service doesn't go directly to the service itself](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=75.40000000000002) [and instead goes to a server in front of the service,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=79.64615384615384) [which then decides which of the multiple instances](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=83.25454545454544) [it should forward the request to.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=86.22857142857143) [With client-side load balancing, there is no intermediary.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=88.8) [The client, or the caller of the service,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=91.8) [is aware of all of the instances of a service via a](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=94.08571428571433) [known list or service discovery.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=98.52727272727272) [And the client is then responsible for deciding which of the](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=100.8) [multiple instances it should send the request to.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=104.46666666666661) [To solidify our understanding of server-side versus client-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=107.8) [let's look at each of them side by side.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=111.2) [With server-side load balancing, the server obviously distributes the request,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=114.8) [and with client-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=119.13333333333333) [the client obviously distributes the request.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=120.79999999999997) [Server-side load balancing is typically hardware based,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=123.3) [but it can also be software based.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=126.68888888888888) [Client-side load balancing, on the other hand, is software based.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=129.8) [You incur an extra hop with server-side load balancing since](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=133.8) [the request doesn't go directly to the service and has to go](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=136.52727272727282) [through an intermediary first.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=140.46666666666678) [Whereas with client-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=141.8) [you don't incur any extra hops once you know the location of the services.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=143.30000000000007) [Both server-side and client-side load balancing have support](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=148.8) [for various load balancing algorithms.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=151.46666666666675) [With server-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=153.8) [the actual load balancing happens outside of the request process,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=155.8) [whereas with client-side load balancing,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=159.8) [the actual load balancing happens within the request process.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=162.0222222222223) [And lastly, server-side load balancing can be either centralized or distributed,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=166.0222222222223) [whereas client-side load balancing is typically distributed.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=171.8) [Given all of these differences,](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=175.8) [it's clear that client-side load balancing is a natural fit for cloud-native architectures.](https://app.pluralsight.com/course-player?clipId=2191aef2-ef7f-4023-8182-ffd4dd16aee4&startTime=177.30000000000007)

### [Getting Started with Spring Cloud and Netflix Ribbon](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc)

[We've set the stage for client-side load balancing.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=0) [Now let's talk about how to actually implement it with Spring Cloud.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=5.033) [As I mentioned in the introduction to this module,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=10.033) [we'll use a library called Netflix Ribbon to](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=12.109923076923069) [implement client-side load balancing.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=14.533) [And Netflix Ribbon is an Inter Process Communication library](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=16.033) [that has built-in software load balancers.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=19.30572727272727) [Spring Cloud adds full integration with Netflix](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=23.033) [Ribbon to Spring's RestTemplate class.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=27.116333333333326) [And we'll go into detail about what this exactly means,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=30.033) [but in essence our RestTemplate will now understand how to balance](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=33.10992307692307) [requests across multiple instances of a service.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=38.033) [Spring Cloud also adds features that make it really easy to declare different](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=40.851181818181836) [types of load balancing algorithms and availability checks.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=45.57845454545457) [Next, let's talk about how to use Spring Cloud and Netflix Ribbon.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=51.033) [And before we get started, just a quick note.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=54.033) [In each of these sections I'll explain all of the](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=57.033) [steps necessary to kind of get going,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=60.10992307692307) [and then at the end we'll walk through a demo where you can follow along.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=62.366333333333344) [Using Netflix Ribbon with Spring Cloud is extremely easy,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=67.48754545454544) [just like all of the other Spring Cloud projects.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=70.76027272727272) [In your dependencyManagement section of your pom.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=74.033) [xml, define a new dependency on spring-cloud-dependencies.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=76.57845454545452) [And make sure that it's of type pom and has a scope of import.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=79.69966666666667) [Still within your pom.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=86.1099230769231) [xml, in the dependency section,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=87.64838461538464) [define a new dependency on spring-cloud-starter-ribbon.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=90.43299999999998) [Spring Cloud's Netflix Ribbon support adds two new annotations.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=94.033) [The first one is the @LoadBalanced annotation,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=99.033) [and this annotation is used when you're creating a RestTemplate.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=101.57845454545452) [And it's used to mark that that RestTemplate should be a load balanced](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=105.53300000000003) [RestTemplate as opposed to just a standard RestTemplate.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=110.57845454545452) [The second annotation is the @RibbonClient annotation,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=113.81077777777777) [and this annotation is mainly for configuration purposes.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=117.23299999999999) [You would use it to configure a custom Ribbon client,](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=122.033) [as well as when you're not using service discovery to](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=125.60442857142861) [set up an actual Ribbon client. Let's look at how to use the @LoadBalanced annotation first.](https://app.pluralsight.com/course-player?clipId=33d392d0-81bd-4571-a96a-6d289f1a52fc&startTime=129.2665)

### [Using the @LoadBalanced Annotation](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c)

[It's really easy to get started and create a load balanced RestTemplate.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=1.1) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=6.1) [you define a new method annotated with @Bean that returns a new RestTemplate.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=7.554545454545453) [Then you annotate that same method with the @LoadBalanced annotation.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=12.82727272727273) [And what this does is it tells Spring that the](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=17.372727272727268) [RestTemplate should support load balancing.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=21.43333333333333) [And what that means behind the scenes is that the RestTemplate](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=23.1) [that's returned will actually have an interceptor,](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=25.85) [a RestTemplate interceptor,](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=30.10000000000001) [that utilizes the Ribbon load balancer client to actually call our](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=32.1) [services and balance between the different instances.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=37.1) [And, by default, it'll use a round-robin algorithm for distributing that load.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=41.1) [Next,](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=47.1) [let's look at how you would actually use this load balanced](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=47.35) [RestTemplate if you were trying to call a service and you](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=50.1) [were using service discovery.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=54.499999999999986) [Suppose you had two instances of a service called my-service running](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=56.1) [on port 9000 on multiple servers at mycompany.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=60.1) [com.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=65.43333333333334) [And also suppose that my-service was discoverable via service discovery.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=66.1) [Instead of passing the mycompany.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=71.1) [com URL or IP address to the RestTemplate,](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=73.18333333333335) [you can actually pass a URL that uses a logical](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=76.55454545454545) [identifier to represent the service.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=81.1) [In this case, we've used the logical identifier my-service.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=82.9181818181818) [And this is the same name that the service is registered](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=86.46363636363635) [under at the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=91.43333333333332) [And at runtime the RestTemplate will function as the client-side load balancer.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=94.1) [And it'll use service discovery to resolve the real location of the](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=100.1) [my-service instances and then use the configured load balancing algorithm to distribute the load between them.](https://app.pluralsight.com/course-player?clipId=b00ff3c5-1796-4271-bf28-0b7ae8e2368c&startTime=105.1)

### [Demo: Load Balancing Using Ribbon with Service Discovery](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8)

[In this demo,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=0) [we'll set up a Ribbon client that utilizes service discovery and](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=1.26125) [balances requests between multiple instances of a service.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=6.045) [Since we'll be using service discovery to locate the instances of the service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=10.045) [we'll need to have a Service Discovery Server set up.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=14.408636363636363) [If you've been following along in the previous modules of the course,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=18.045) [you should already have the discovery server set up within your IDE.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=21.045) [If not, you'll need to grab the project from GitHub at github.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=25.045) [com/dustinschultz/scf-discovery-server, and then import that into your IDE.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=29.21166666666667) [Once you have the discovery server set up, we're ready to get started.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=36.045) [Open up a browser and head over to start.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=40.045) [spring.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=43.3177272727273) [io.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=43.68136363636367) [In the Group section, change this to io.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=44.045) [schultz.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=48.045) [dustin.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=48.545) [And then for the name of the artifact,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=49.045) [we're going to call this ribbon-time-service.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=50.27576923076923) [In the Dependencies section,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=51.67) [add the Web dependency and the Eureka Discovery dependency.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=54.17) [Once you have everything filled out, click the Generate Project button,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=60.045) [and it'll create and download a zip for you.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=63.345) [Still on the SPRING INITIALIZR page,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=66.045) [change the artifact name from ribbon-time-service to ribbon-tie-app.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=68.22681818181816) [Then, in the Dependencies section, add a new dependency on Ribbon.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=72.18785714285713) [Again, once you have everything filled out,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=78.22681818181817) [click the Generate Project button, and that'll create and download a zip for you.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=81.17) [Unzip both of those zip files and head back to your IDE.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=86.045) [I've already imported the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=90.045) [so let's quickly import the ribbon-time-app.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=91.71166666666664) [Right-click on the empty area within the Package Explorer,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=93.84500000000001) [go to Import, choose Existing Maven Projects,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=97.645) [click Next, click Browse, browse to the location of the downloaded zip file,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=101.84499999999996) [click Open, and click Finish.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=108.045) [We'll work on the ribbon-time-service first,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=110.04500000000003) [so expand the project and open up the main application class.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=112.46166666666667) [Within the main application class, add two annotations,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=117.045) [the @RestController annotation and the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=121.045) [Then we need to add one request handler method,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=128.045) [so hit Return a few times and do public String getTime.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=129.9735714285715) [And we'll annotate that with a shortcut version @GetMapping,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=135.04499999999993) [which is just a request mapping that's a GET.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=140.545) [Then in the body of the method we'll return The current time is,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=145.045) [and we'll construct a new Date object and turn that into a string.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=151.045) [For demonstration purposes,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=156.045) [we're going to want to know which instance is responding to the request.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=156.86318181818183) [And currently we have no way of telling.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=160.96807692307692) [We wouldn't be able to tell one from the other.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=164.045) [So we're going to make one addition to the response.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=166.045) [So we're going to say + answered by service running on,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=169.045) [and then we'll have a port variable, and then we'll close that parenthesis.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=175.3307142857144) [And since each of our services has to be running on a different port,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=181.045) [we can tell each one of them apart.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=184.045) [So let's make sure that we actually define that port variable.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=185.75928571428577) [Come up here and add a private int port,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=189.12833333333327) [and then we'll annotate this with @Value annotation.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=193.045) [And we'll inject this with the server.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=197.045) [port variable.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=200.9338888888888) [And before we fire this up,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=202.045) [we need to configure a few properties within our application.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=203.42961538461535) [properties.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=206.1359090909091) [So go ahead and close that and open up](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=206.49954545454548) [src/main/resources and open up the application.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=210.24499999999998) [properties file.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=213.84499999999994) [In the application.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=215.045) [properties, we're going to set two properties.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=215.94500000000002) [The first one is the spring.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=218.045) [application.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=221.045) [name property, and we're going to set that to time-service.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=221.545) [And the second property we'll set is to configure the](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=225.96807692307692) [location of the Service Discovery Server,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=230.045) [so eureka.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=233.045) [client.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=234.6813636363636) [service-url.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=235.49954545454543) [defaultZone.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=236.31772727272724) [And then we'll set that to localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=237.13590909090905) [We now have everything we need to start the ribbon time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=242.64499999999998) [so we can go ahead and close this and minimize this.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=248.81423076923076) [And the first thing we'll want to do is start the discovery server.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=253.045) [So expand the discovery-server project and navigate](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=257.045) [to the main application class.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=259.3783333333332) [Right-click on the main application class, and go Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=261.045) [Go ahead and minimize the discovery-server and expand the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=268.045) [and navigate to the main application class,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=271.545) [right-click on it, and go to Run As, and then choose Run Configurations.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=275.045) [Since we're starting up two instances of the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=281.045) [we need to configure two different run configurations.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=284.045) [So if you come up here to the New launch configuration button,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=288.045) [click that, and it'll create a new run configuration for you.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=291.045) [We'll rename this to ribbon-time-service-1.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=295.045) [And then for the Project, we'll make sure that we choose the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=302.045) [and for the Main type, hit Search and locate the RibbonTimeServiceApplication.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=306.045) [In the Override properties section, we'll set the server.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=312.045) [port, and we'll set that to 4444.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=316.545) [And click Apply,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=319.6164285714287) [and then we're going to duplicate this configuration and](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=320.902142857143) [change the server port from all 4s to all 5s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=324.7592857142858) [So come up here to the Duplicate configuration button,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=329.045) [click that, change the name from ribbon-time-service-1 to -2,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=333.13590909090897) [and change the port from all 4s to all 5s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=338.4995454545454) [Once you've got everything configured,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=343.22681818181826) [you can highlight the ribbon-time-service-1 and click Run.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=345.045) [And then for the second instance, right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=351.045) [go to Run As, locate Run Configurations,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=354.545) [highlight the ribbon-time-service-2, and click Run.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=358.045) [Just to make sure everything's running correctly,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=365.045) [open up a browser and visit localhost:4444.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=366.9540909090908) [And do the same, but change those 4s to all 5s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=369.7592857142857) [You should get a response from each of the services with the](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=376.045) [current time and then the current time and answered by service](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=379.73730769230787) [and whatever the respective port is.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=384.2116666666669) [We can also quickly check that each of the services registered](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=386.2757692307693) [itself with the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=390.045) [So open up a new tab and visit localhost:8761.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=393.045) [If you scroll down under the heading Instances currently registered with Eureka,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=398.045) [you'll see the application TIME-SERVICE,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=403.045) [and you'll see that there are two instances.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=405.545) [They're both UP.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=408.92) [One of them is running on all 5s and another is running on all 4s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=410.045) [And we're back within the IDE,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=414.045) [and so far all we've done is we've set up multiple instances](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=416.0449999999999) [of the ribbon-time-service and had each of them register with](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=420.40863636363633) [the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=424.71166666666664) [We're now ready to start developing the piece where we'll](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=426.045) [use Ribbon to load balance between each of the instances](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=428.545) [of the ribbon-time-service.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=433.4086363636365) [In the Package Explorer under the ribbon-time-app,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=435.045) [expand it and navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=437.84499999999986) [Go ahead and expand the main application class just](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=441.54500000000013) [to give us a little bit more room.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=444.8631818181818) [Just like we did with the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=447.045) [we'll add two annotations: first, the @RestController annotation,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=448.44499999999994) [and second, the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=453.3307142857142) [Next we'll inject a RestTemplate, so private RestTemplate,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=456.7592857142857) [and make sure you annotate it with @Inject.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=461.3783333333333) [And there's nothing right now that's providing this RestTemplate,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=466.045) [so we're going to create a method that will return that new](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=469.045) [RestTemplate as a load balance RestTemplate.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=472.045) [So if you come down here below the main, do public RestTemplate.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=475.045) [Then within the body of the method, you're going to return new RestTemplate.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=482.045) [And then annotate this with @Bean and @LoadBalanced.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=487.045) [Now we need one more method, and that's the RequestMapping method,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=495.045) [to actually handle the request for our ribbon-time-app.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=499.045) [So come up here and do public String getTime,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=503.045) [and we'll annotate this with the shortcut mapping again,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=507.89115384615394) [so @GetMapping.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=512.9021428571428) [And then within the body of the method,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=514.045) [we're going to use the RestTemplate to call our](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=515.2757692307695) [time-service and return the result.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=518.2672222222221) [So we'll say return restTemplate.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=521.045) [getForEntity.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=526.045) [And then we'll say http://, and remember we use a logical identifier here,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=527.045) [so we'll say time-service.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=533.545) [And we'll say that the return type is a string and then make](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=535.545) [sure that we call getBody on the response.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=541.1878571428573) [We're now ready to start up our ribbon-time-app and give it a run.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=544.045) [So let's unmaximize this and right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=548.045) [go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=551.645) [Next, fire up a browser and visit localhost:8080.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=557.045) [And you can see the response from the service running with the port on all 4s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=561.045) [And if we refresh that, we'll see the one running on the port with all 5s.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=566.045) [And we can continue to refresh that,](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=570.045) [and we'll see that it alternates between each of the instances in a round-robin fashion.](https://app.pluralsight.com/course-player?clipId=39a09f8a-9580-48ec-87bf-071a2472c4d8&startTime=572.1988461538458)

### [Using the @RibbonClient Annotation](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d)

[Now let's take a look at the other annotation, the @RibbonClient annotation.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=1.812) [First we'll see how to use this annotation along with the](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=6.812) [@LoadBalanced annotation to achieve client-side load](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=9.812) [balancing without service discovery.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=14.612000000000004) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=17.812) [define the @RibbonClient annotation and set the name](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=20.03422222222223) [element to a meaningful value.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=23.937) [You'll actually refer to this value in the configuration,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=25.812) [as well as the URL of the RestTemplate.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=28.81199999999999) [Then, in your application.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=32.08472727272727) [properties or your application.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=33.902909090909084) [yml, define two new properties.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=36.24057142857143) [And remember the name element that we set on the @RibbonClient annotation.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=39.812) [You'll prefix each of your properties with that value.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=44.812) [So the first property, the ribbon\_client\_name.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=48.812) [ribbon.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=54.14533333333331) [eureka.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=55.0342222222222) [enabled=false, tells Ribbon to disable service discovery support.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=55.92311111111108) [The next property, the ribbon\_client\_name.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=60.812) [ribbon.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=63.669142857142845) [listOfServers,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=64.24057142857141) [is a comma-separated list of URLs that Ribbon should](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=64.812) [use to distribute the requests among.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=69.312) [And in this case, we've set the different URLs to two different addresses,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=71.96584615384616) [one running on port 9000 and the other running on port 9001.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=76.90290909090908) [Once you have everything configured,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=82.03422222222223) [you can use the RestTemplate just like you did with service discovery.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=84.812) [Except this time instead of calling the service name,](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=87.812) [you use the value of the name element that you set up in the @RibbonClient annotation.](https://app.pluralsight.com/course-player?clipId=e13928aa-a97b-477a-9557-d3a0d709b30d&startTime=91.56200000000004)

### [Demo: Load Balancing Using Ribbon Without Service Discovery](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739)

[In this demo,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=2) [we'll learn how to utilize the Ribbon client without service discovery.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=3.0714285714285716) [Now,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=7) [we're going to build on the previous demo that we did utilizing service](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=7.189692307692308) [discovery as each of the demos share a lot in common.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=9.843833333333333) [The first thing we'll do is expand the ribbon-time-service](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=14) [and open up the main application class.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=17.3495) [In the main application class, remove the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=20.243777777777773) [Go ahead and close that, and open up the src/main/resources application.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=25.466) [properties,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=29.966) [and delete the property that sets the location of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=30.466) [Once you've got the property deleted, go ahead and close that.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=35.96599999999999) [And we're now ready to start up the](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=39.18028571428571) [ribbon-time-service without service discovery.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=41.466) [If you come up here to the green Play button and](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=44.466) [click the little drop-down caret,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=47.60885714285713) [you'll see that we have all of our run](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=49.13266666666667) [configurations that we've use in the past.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=52.132666666666694) [So we'll want to use each of these](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=54.18028571428571) [ribbon-time-services to start each of the instances.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=56.466) [So we'll start ribbon-time-service-1, and then we'll start ribbon-time-service-2.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=60.466) [Just to make sure that our ribbon-time-service instances started up correctly,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=68.466) [let's do a quick sanity check.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=72.966) [So visit localhost:4444, and it's running there.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=75.966) [And then open up a New Tab and visit localhost:5555, and it's running there.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=79.00446153846154) [So everything with our ribbon-time-service is good to go.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=85.24377777777778) [Next,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=90.466) [we'll minimize the ribbon-time-service project and open up the ribbon-time-app.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=91.01145454545454) [And once you've opened it, navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=96.466) [And just like we did with the ribbon-time-service,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=100.466) [we'll want to delete this @EnableDiscoveryClient.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=101.92054545454549) [Now we're going to add a new annotation,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=103.966) [the @RibbonClient annotation,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=107.966) [and we're going to set the name element to the time-service string.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=109.466) [And this is the same time-service that we used when](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=115.73872727272727) [we were using service discovery,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=120.46600000000002) [and we'll use it in pretty much the same fashion.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=122.466) [We'll refer to it in the RestTemplate URL as a logical service identifier,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=125.466) [and then configure what those particular instances are that](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=131.02155555555555) [represent that service within configuration.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=135.966) [Let's go ahead and close this and open up our](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=138.466) [src/main/resources and our application.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=142.63266666666658) [properties.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=144.60885714285718) [In our application.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=145.18028571428576) [properties,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=146.8945714285715) [we'll prefix all of the properties that we're setting up to configure](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=147.466) [our Ribbon client with the name of the Ribbon client.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=150.466) [In our case, we use time-service.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=154.466) [So we'll say time-service-ribbon-eureka-enabled=false.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=156.46600000000007) [And this is the property that'll tell Ribbon not to use service discovery.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=164.466) [So we have one more property to set, so we'll say time-service.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=169.466) [ribbon.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=178.89457142857134) [listOfServers.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=179.68028571428562) [And we'll set this to a comma-separated list of the location of](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=180.466) [all of the instances of our time-service.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=183.89457142857134) [So we have http://localhost:4444,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=189.466) [and then we have that exact same one except for it's all 5s.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=193.466) [And that's all the configuration we need to get set up,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=197.466) [so we can go ahead and close this.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=200.3993333333335) [And we can go over to our main application class,](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=202.3890769230769) [right-click on it, go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=205.00446153846156) [Next, go ahead and fire up a browser and visit localhost:8080.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=211.466) [And you can see that we got a response from the](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=215.466) [service running on the port with all 4s.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=218.05760000000006) [And if we refresh that, we'll see that we get a response from the one on all 5s.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=220.06666666666672) [And we can continue to refresh that and see that it round-robins between each of the instances of the time-service.](https://app.pluralsight.com/course-player?clipId=c609cb95-27a3-4afc-a23c-7da8237bc739&startTime=225.23299999999992)

### [Customizing Your RibbonClient Configuration: Introduction](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3)

[In this last section,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=1) [we'll learn how to customize an individual Ribbon](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=2.4421818181818185) [client using declarative configuration.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=5.766) [And what this will allow us to do is define custom configuration that applies to](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=8.966) [a specific Ribbon client instead of to all Ribbon clients.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=13.799333333333331) [And what that buys us is it allows us to define different client-side](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=17.966) [load balancing behavior for different services.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=22.966) [In your @Configuration class,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=26.966) [define the @RibbonClient annotation and set the name element just like](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=29.18822222222223) [we did when we configured the previous Ribbon client.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=33.966000000000015) [This time though, you'll define an additional configuration element,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=36.966) [and you'll set that to another @Configuration class.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=39.966) [This additional @Configuration class will contain all of the](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=44.966) [custom configuration for a specific Ribbon client.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=48.56599999999999) [And that configuration is defined by methods that are](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=51.966) [annotated with the @Bean annotation.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=55.2387272727273) [So this configuration is just like any other @Configuration class.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=57.35061538461538) [There's nothing special about it.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=61.966) [You would just configure your @Beans just like you do normally.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=63.46599999999999) [But since this configuration only pertains to a specific Ribbon client,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=67.14781818181815) [it shouldn't be subject to any sort of component scanning.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=71.46600000000002) [If it were,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=75.42054545454543) [the configuration that was defined in that @Configuration](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=76.51145454545451) [class would end up applying to all Ribbon clients instead of](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=79.42054545454543) [just a specific Ribbon client.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=83.74377777777777) [There are a number of different classes that are](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=85.966) [needed to set up a Ribbon client,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=87.89457142857137) [and by default Spring Cloud defines those as @Beans and then allows you](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=89.966) [to override any of them for custom configuration.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=96.32963636363635) [Let's take a look at the Spring Cloud documentation to](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=99.966) [see what @Beans you can override.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=103.04292307692306) [I've loaded up the Spring Cloud documentation,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=105.966) [and we're looking at a number of different beans that are](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=107.716) [required to set up a Ribbon client.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=110.81215384615383) [And for the most part,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=112.966) [you typically won't need to override any of these with](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=114.50446153846153) [the exception of two of the beans.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=117.63266666666665) [That's the IRule bean and the IPing bean.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=119.966) [The IRule bean controls the load balancing algorithm,](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=123.04292307692309) [and the IPing bean controls the availability checks on the](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=126.466) [instances that are being load balanced. Let's take a look at each of these beans in a bit more detail.](https://app.pluralsight.com/course-player?clipId=5c7da83f-bd6c-4fe9-b1c8-6c866c3506c3&startTime=130.97733333333335)

### [Customizing Your RibbonClient Configuration: The IRule Bean](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4)

[As I mentioned,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=2.029) [the IRule bean is used to control the load balancing strategy](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=2.9520769230769224) [that's used to balance the distribution of workload between the](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=6.429) [instances that are being load balanced.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=10.600428571428571) [You can choose to create your own custom IRule implementation,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=14.029) [or you can choose from one of the several different defaults.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=17.029) [Let's talk about a few of our available options.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=20.029) [There's the RoundRobinRule implementation,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=23.029) [which is just like it sounds,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=24.80677777777777) [an implementation of the round-robin balancing algorithm,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=27.529) [which distributes the workload evenly among all instances.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=31.029) [There's the ResponseTimeWeightedRule implementation,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=36.029) [which is also a round-robin algorithm,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=38.029) [but it dynamically assigns weights based on the average](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=40.829) [response time from each of the instances.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=44.529) [There's the RandomRule implementation,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=48.029) [which simply picks an instance to send traffic to at random.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=49.362333333333346) [And there's the ZoneAvoidanceRule,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=54.029) [which is also a round-robin algorithm implementation; however,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=56.029) [it filters out servers to send traffic to based on](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=59.33669230769231) [the AWS zone and availability.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=62.413615384615376) [Let's look at an example to make this a bit more concrete.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=66.029) [If, for instance,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=69.029) [we wanted to override the default IRule to use the](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=69.95207692307692) [RoundRobinRule implementation,](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=73.029) [we'd define a new method annotated with the @Bean annotation, and we'd return a new RoundRobinRule.](https://app.pluralsight.com/course-player?clipId=5341b0c0-2c8b-4a4b-8da2-992d762fb3e4&startTime=74.14011111111111)

### [Customizing Your RibbonClient Configuration: The IPing Bean](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82)

[The IPing bean is responsible for choosing the strategy to](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=2.229) [check the liveliness or the availability of a given](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=5.562333333333333) [instance that's being load balanced.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=10.312333333333335) [Just like the IRule bean,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=13.229) [you can also implement your own custom IPing implementations,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=14.767461538461541) [or you can choose from one of the several different defaults.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=17.645666666666667) [Let's take a look at what's available.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=22.229) [There's the DummyPing implementation, which is just as dumb as it sounds.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=25.02899999999999) [It's simply always returning true when it's asked](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=29.229) [about the liveliness of a service.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=32.138090909090906) [You'd use this if you simply don't care to check the](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=34.08614285714285) [liveliness or the availability and you always want to send](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=37.229) [traffic to all of the instances regardless.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=40.562333333333356) [There's the PingUrl implementation,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=44.006777777777785) [which is an implementation that allows you to set an](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=46.229) [expected response and then makes an actual HTTP call to](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=50.39566666666664) [the service and checks the result.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=54.657571428571444) [So you'd typically point this at something like the service's health check URL.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=57.229) [And then there's the DiscoveryPing implementation,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=61.229) [which would be something that would be automatically configured for you if](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=63.895666666666656) [you were using something like Eureka service discovery.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=67.6835454545454) [And what this would do is it would just consult with the discovery client](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=71.229) [to determine the liveliness of any particular instance.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=74.89566666666667) [Again, let's look at an example to make this a bit more concrete.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=80.229) [So just like we did with the IRule implementation,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=84.229) [you would define a new method annotated with the @Bean annotation,](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=86.99823076923076) [and then you return the implementation of your choice.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=91.41081818181817) [So in this case, we're going to return a PingUrl.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=94.89566666666664) [So we create a new instance of the PingUrl, we set the expected content to true, and then return that instance.](https://app.pluralsight.com/course-player?clipId=0b1291ca-81fb-41e1-aac2-197746742e82&startTime=98.729)

### [Demo: Customizing the RibbonClient Load Balancing Strategy](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449)

[In this demo,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=2.129) [we'll learn how to customize our Ribbon client that we're](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=2.879) [using to call the ribbon-time-service.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=5.629) [And again, we're going to be building on the previous demo.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=8.129) [So make sure that you've completed the demo where you set up a](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=12.129) [Ribbon client without using service discovery.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=14.914714285714275) [The first thing we'll do is we'll come up here to the green Play button and](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=16.947181818181818) [start each of the instances of the ribbon-time-service.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=21.98614285714285) [To speed things up,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=25.314500000000006) [I fast forwarded to the point where both of the](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=27.5) [ribbon-time-service instances are started.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=30.799090909090907) [Now remember, in order to create custom configuration for a Ribbon client,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=32.329) [we need to create our own @Configuration class.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=37.4366923076923) [Let's open the ribbon-time-app project and create a new package.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=41.129) [So right-click, New, and come here to Package.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=46.129) [And we're actually going to rename this from io.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=50.129) [schultz.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=53.87899999999998) [dustin to io.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=54.29566666666664) [schultz.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=55.71233333333333) [config.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=56.29566666666667) [dustin.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=56.879000000000005) [Remember that we want to have a different package name so that the](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=57.46233333333334) [@Configuration class isn't subject to component scanning; otherwise,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=64.629) [it would apply to all of our Ribbon clients.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=68.37900000000002) [In the new package, right-click and go to New and choose Class.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=72.129) [And we'll call this our RibbonTimeConfig class.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=77.129) [Go ahead and click Finish.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=82.129) [Then we're going to annotate this class, of course, with @Configuration.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=83.379) [And then for this demo, we're going to customize the load balancing strategy.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=86.90677777777778) [So we'll come down here and we'll define a new IRule.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=93.129) [So we'll say public IRule, and we'll call this ribbonRule.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=97.129) [And then in the body of the method, we'll say return new RandomRule.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=101.129) [And what this will do is it'll pick a random instance to send](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=107.129) [traffic to as opposed to what we were using before where we were](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=111.7718571428572) [evenly balancing between each of the instances.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=115.82130769230768) [And last,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=118.12899999999998) [make sure that we don't forget to add the @Bean annotation to our method.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=118.79566666666663) [We're done with our custom configuration, so we can go ahead and close that.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=125.129) [And then we can open up the main RibbonTimeApplication.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=129.129) [And on the RibbonClient annotation, add a new configuration element,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=133.129) [and set it to the custom configuration class that we set up,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=138.129) [the RibbonTimeConfig class.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=146.92899999999983) [We're now ready to start up our application and try](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=149.129) [out our custom configuration.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=151.98614285714277) [So go ahead and close this and right-click on the main application class,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=153.129) [go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=157.629) [Go ahead and fire up a browser and visit localhost:8080.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=162.129) [And, as you can see,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=167.129) [we got a response from the instance running with the port that's all 5s.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=168.55757142857138) [And if we refresh that, we'll see that we get an instance with all 4s.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=172.4623333333334) [But if we continue to refresh it,](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=177.21233333333328) [we'll see that it doesn't evenly balance between each of the instances like it did before and instead picks them at a random interval.](https://app.pluralsight.com/course-player?clipId=8acfa832-e345-487a-a43b-d70888a04449&startTime=180.129)

### [Summary](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752)

[We're at the end of this module, so let's quickly go over what we learned.](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=0.996) [We first talked about what is load balancing and what are the differences](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=4.996) [between client-side load balancing and server-side load balancing.](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=8.662666666666667) [Then we introduced the Netflix Ribbon project and learned how to use the](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=13.996) [@LoadBalanced and the @RibbonClient annotations to set up client-side load](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=17.551555555555556) [balancing with and without service discovery.](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=22.996) [In the last section,](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=25.996) [we saw how we could use the @RibbonClient annotation with a](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=27.164000000000005) [separate @Configuration class to set up custom configuration for a specific Ribbon client.](https://app.pluralsight.com/course-player?clipId=cd0fe638-9046-4652-b811-cc1bc09df752&startTime=30.8488)

## [Creating Self-healing Services with Circuit Breaker](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647)

### [Introduction](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647)

[Hi, I'm Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=0) [and in this module we'll learn how to develop services in a cloud-native](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=1.5384615384615385) [architecture that are both fault tolerant and self-healing.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=6.600000000000001) [We'll begin the module with a short section on failures in](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=11) [a cloud-native or distributed system.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=14.666666666666673) [We'll look at why failures are more prevalent and understand a](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=16.599999999999998) [common side effect called cascading failures.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=21.272727272727266) [Then we'll introduce and understand the Circuit Breaker pattern and learn](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=24) [how it can help us build more fault-tolerant services.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=28.3) [Next, we'll dive into Netflix Hystrix, which is a fault-tolerance library that,](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=31) [among other things, implements the Circuit Breaker pattern.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=35.8) [We'll see how Spring Cloud makes it easy to get started](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=39) [with the @EnableCircuitBreaker annotation,](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=41.53846153846157) [and then we'll understand how to use the @HystrixCommand annotation to](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=42.888888888888886) [implement the Circuit Breaker pattern in our own services.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=48.5) [We'll finish the module out by looking at one of the really nice](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=52.66666666666668) [features of Hystrix called the Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=57.30769230769232) [We'll see how to enable it, how metrics are collected,](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=60) [how to interpret those results,](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=63) [and how to aggregate those results using another project from Netflix called Turbine.](https://app.pluralsight.com/course-player?clipId=7bc9bd75-b0a8-4223-8261-3520b7b15647&startTime=64.81818181818181)

### [Cascading Failures and Resource Overloading](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a)

[In a distributed system, if there's anything that we can be 100% sure about,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=2.167) [that's that failure is inevitable.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=7.167) [But why though?](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=10.167) [Well, failure can happen at many different levels in a system.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=11.167) [Hardware can fail, networks can fail, and software can definitely fail.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=14.167) [And a distributed system is no different in that sense,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=19.167) [but the likelihood for failure is just simply much greater.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=23.167) [You have more hardware, you have more network, and you have more software.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=27.167) [And with these increased numbers comes that increased probability for failure.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=31.167) [Adding to that chance of failure is the way in which](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=36.167) [processes communicate in a distributed system.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=38.917) [Process communication that was once within a](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=41.389222222222216) [process is now done across a network.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=44.367) [And even as resilient as our networks are today,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=47.167) [there's still a much more likely chance of a communication](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=49.93623076923076) [failure across a network versus within a process.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=53.3488181818182) [A particularly bad side effect of failures in a distributed](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=58.167) [system is something called a cascading failure.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=61.50033333333336) [A cascading failure is a failure in a system in which a](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=64.167) [failure in one system can cascade, almost like dominos,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=68.85930769230771) [to other parts of the system causing them to fail as well.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=72.36700000000002) [To make this a bit more concrete, imagine that you have three services,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=77.167) [Service A, Service B, and Service C.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=80.792) [Service A calls Service B, and Service B calls Service C.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=85.167) [And imagine that Service C runs out of memory and is very](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=90.167) [slow to serve requests to Service B.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=93.5955714285715) [And even though Service B may have a timeout set up for calling Service C,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=95.70546153846153) [if enough requests stack up against Service B,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=101.0836666666667) [which require the use of Service C at a fast enough rate,](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=104.23842857142859) [resources at Service B will be entirely consumed](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=108.53063636363636) [before that timeout is ever reached, which in turn will cause Service B to fail.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=111.43972727272724) [This same problem can happen all the way up the chain.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=117.167) [There are multiple issues at play here.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=121.167) [First, we have a fault tolerance problem.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=123.66700000000003) [Calling services are unaware that the service that they're calling is likely](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=126.167) [to fail and yet they still attempt to call the service.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=130.50033333333334) [And second, we have a resource overloading problem.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=134.167) [Calling services are allowed to invoke dependent services with pretty much unconstrained resources.](https://app.pluralsight.com/course-player?clipId=18d34885-51c5-41d3-80ee-ad0872719f7a&startTime=137.167)

### [Embracing Failure with the Circuit Breaker Pattern](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879)

[So how do we solve this problem of cascading failures and](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=1.787) [failures in general in a distributed system?](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=6.0177692307692325) [Well,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=8.787) [we have to learn to embrace and tolerate failures](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=9.120333333333335) [and degrade gracefully when we do.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=12.12033333333334) [So in the event that a downstream dependent service is failing,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=14.120333333333337) [it's actually better for the caller not to attempt to](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=18.037000000000003) [make a call to the dependent service, which is likely to fail.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=22.094692307692306) [And instead, the caller should fail fast or degrade gracefully,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=25.787) [perhaps by returning old data or empty results,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=29.787) [and allow the failing service to recover.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=33.120333333333335) [And then periodically check if the service has recovered.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=36.287) [And, in turn,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=40.787) [what this does is it relieves pressure from any upstream](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=41.71007692307692) [services that are waiting for a response.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=44.787) [And the other thing that we need to do is we need to](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=47.47930769230771) [limit the resources that are consumed.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=51.40238461538463) [So clients should put limits on the number of resources](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=52.787) [allowed to call a dependent service.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=56.95366666666664) [And what this does is it prevents those requests from stacking up unconstrained,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=59.12033333333334) [which could cause the client to fail itself.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=63.78699999999999) [The first strategy for fault tolerance is actually a well-known pattern,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=68.787) [so much so that it has its own name.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=72.18700000000001) [And it's called the Circuit Breaker pattern.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=75.787) [And the Circuit Breaker pattern is a design pattern in modern software](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=77.787) [used to detect failures and encapsulate the logic of preventing those](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=82.787) [failures from reoccurring constantly.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=87.787) [The name Circuit Breaker comes from the idea that the pattern shares a lot](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=89.56477777777778) [of similarities with how a real circuit breaker works.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=94.35842857142863) [And you may or may not be familiar with what a circuit breaker is,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=97.01776923076923) [so let me quickly explain.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=101.28699999999999) [A circuit breaker is a switch that prevents too much](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=102.787) [current from flowing through a circuit.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=106.12033333333329) [And if too much current flows through a circuit,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=108.12033333333332) [it could cause damage or even start things on fire.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=111.15063636363637) [And what the circuit breaker does is it prevents that by](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=114.787) [opening the circuit when it detects that there's too much](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=118.17161538461538) [current flowing through it.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=121.45366666666663) [In the picture on the left,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=122.787) [we have a circuit panel that has four circuit breakers on it.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=124.07271428571426) [And you most likely have something like this in your residence to](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=127.12033333333332) [prevent your circuits from becoming overloaded.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=131.38700000000003) [And, if you notice, all of the switches are flipped down in the picture,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=133.787) [and thus all of the circuits are closed.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=137.23144444444446) [Suppose you accidently overload the rightmost circuit by](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=140.787) [plugging in a device that consumes a lot of power.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=143.696090909091) [And the circuit breaker would detect this and break the circuit,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=147.1203333333334) [or open it, and prevent any additional current from flowing through it.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=151.28699999999995) [And you can see in the picture that the rightmost switch is](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=155.787) [flipped up indicating that the circuit has been broken and there](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=160.07271428571434) [is no more current flowing through it.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=163.037) [By now,](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=165.0177692307693) [I'm sure you can see the common theme between a real circuit](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=165.63315384615393) [breaker and the Circuit Breaker pattern.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=170.05972727272734) [Both are meant to detect and prevent failures that might damage other components.](https://app.pluralsight.com/course-player?clipId=665770a5-8f28-4667-a9ff-9fe8ddb56879&startTime=172.787)

### [Fault Tolerance with Netflix Hystrix and Spring Cloud](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82)

[Spring Cloud implements fault tolerance with the help of a](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=1.287) [library from Netflix called Netflix Hystrix.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=4.014272727272726) [Hystrix is a latency and fault-tolerance library,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=8.287) [and it was designed to stop cascading failures and](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=11.468818181818186) [enable resiliency in distributed systems.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=16.287) [It's a concrete implementation of the Circuit Breaker pattern,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=19.287) [and it allows you to easily wrap calls and automatically watches](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=23.287) [them for failures that meet a certain volume and air-percentage](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=26.953666666666653) [threshold within a given rolling window.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=31.787) [The default for the rolling window is 10 seconds,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=33.95366666666668) [and the request volume must be at least 20 requests.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=37.287) [And if 50% or more of the requests are errors,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=42.287) [then the circuit will be tripped and no requests will be allowed through.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=45.85842857142854) [So if for instance you had a thousand requests in a 10 second window,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=50.287) [if 500 of them were errors, then the circuit would be tripped.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=55.287) [Hystrix will periodically recheck if the circuit should be closed,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=60.287) [and it does that by allowing a single request through every 5 seconds.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=63.287) [That's the default.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=68.287) [And if that request succeeds, then it will close the circuit,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=69.28699999999999) [and if it fails, then it will remain open.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=73.01427272727273) [Any requests that are short-circuited or timed-out or rejected or failed will be](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=76.287) [given a chance to execute what's called a fallback method.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=83.44084615384617) [And, as I mentioned before,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=87.287) [a fallback might be something like returning cache data,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=88.65063636363634) [a default value, or just something like an empty response.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=91.67161538461541) [In addition to the Circuit Breaker pattern,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=96.287) [Hystrix also has additional functionality that](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=98.38699999999999) [protects services from being overloaded.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=101.162) [All Hystrix wrap calls are bounded either by a thread pool or a semaphore.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=104.287) [And what this does is it constrains the resource usage,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=110.287) [like we talked about earlier,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=113.36392307692307) [so that requests don't stack up and consume all of the valuable resources.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=115.08700000000002) [And in the event that all of the available resources are consumed,](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=120.287) [any new requests will fail immediately and execute the fallback method, if one is available.](https://app.pluralsight.com/course-player?clipId=2ed100b6-3074-48f3-af45-d71e655ece82&startTime=125.287)

### [Using Spring Cloud and Netflix Hystrix](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a)

[Using Spring Cloud and Netflix Hystrix is extremely easy.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=1.387) [And before we dive in, just a quick note.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=6.387) [I'll explain all the steps necessary to get going and then walk you through](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=8.958428571428573) [a demo at the end where you can kind of follow along.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=12.958428571428579) [I'll follow that pattern throughout the remainder of this module,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=16.296090909090914) [so just keep that in mind.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=19.386999999999993) [Just like you use all of the other Spring Cloud projects,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=21.387) [you start by including a dependency in the](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=24.529857142857132) [dependencyManagement section of your pom.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=27.609222222222215) [xml on spring-cloud-dependencies.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=29.887) [And, as always, make sure that it's of type pom and has a scope of import.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=31.387) [Then, still within your pom.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=38.387) [xml, within the dependency section,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=40.38699999999999) [define a new dependency on spring-cloud-starter-hystrix.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=42.387) [And if you'd like to be able to consume metrics for your Hystrix calls,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=46.387) [you'll also need to include a dependency on the spring-boot-actuator.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=50.841545454545454) [In your main Application class, you define a new annotation,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=55.387) [and that's the @EnableCircuitBreaker annotation.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=59.387) [And then in either your @Component or your @Service class,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=63.387) [locate the method that you want to wrap with Hystrix,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=67.387) [in our case this will be a method called doSomething,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=70.24414285714292) [and annotate that method with the @HystrixCommand.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=74.1562307692308) [Then, on the @HystrixCommand annotation,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=77.387) [define a new attribute called fallbackMethod,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=79.887) [and set that to the name of the method that you want to](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=82.6946923076923) [fall back to in the event of a failure.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=86.787) [In terms of code, that's all there is to it.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=90.387) [But there's a gotcha that you have to look out for,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=92.387) [and that's around the Hystrix timeout.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=95.387) [And you need to make sure that your Hystrix timeouts](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=97.23315384615384) [encompass the caller timeouts plus any of the retries and](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=101.02336363636364) [then a little bit of a buffer.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=106.05366666666666) [And the default timeout is set to 1000ms or a second,](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=108.387) [and if you need to change it, you can use this big, long property to set the timeout in milliseconds.](https://app.pluralsight.com/course-player?clipId=c175fa45-12b8-4eab-a558-e35d0563b80a&startTime=112.78700000000006)

### [Demo: Implementing Fault Tolerance with Netflix Hystrix](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63)

[In this demo,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=1.214) [we'll build a simple weather service that returns a random weather condition,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=2.214) [and then we'll use that in another app called the](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=6.032181818181818) [weather app that consumes that service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=9.214) [And in the weather app we'll protect our call to the weather](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=12.214) [service with Hystrix and implement a fallback for when the](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=14.98323076923076) [weather service is down or not responding.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=18.213999999999995) [We'll be using service discovery to locate the](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=20.668545454545452) [weather service from our weather app,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=23.521692307692305) [so make sure that you have the Service Discovery Server set up within your IDE.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=25.367846153846145) [And if you've been following along throughout the course,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=30.214) [you should already have this set up.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=32.214) [If not, you'll need to grab the project from github.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=34.54733333333335) [com/dustinschultz/scf-discovery-server, and then import that into your IDE.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=42.325111111111084) [We're ready to get started.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=45.214) [Go ahead and open up a browser and head over to start.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=46.285428571428575) [spring.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=49.59861538461538) [io.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=50.06015384615384) [In the Group section, change the group to io.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=50.5216923076923) [schultz.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=54.78542857142857) [dustin, and then for the name of the artifact, name it weather-service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=55.35685714285714) [In the Dependencies section,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=62.214) [add the Web dependency and the Eureka Discovery dependency.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=63.752461538461546) [Once you have everything filled out,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=67.214) [go ahead and click the Generate Project button,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=68.21400000000003) [and it'll create and download a zip file for you.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=69.88066666666666) [We're also going to use this page to generate the weather app project,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=73.214) [so still on this page change the name of the artifact](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=76.214) [from weather-service to weather-app.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=79.88066666666661) [Then in the Dependencies section,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=81.714) [add the Hystrix dependency and the Actuator dependency.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=84.214) [Again, once you have everything filled out,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=89.214) [go ahead and click the Generate Project button,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=90.3806666666667) [and it'll create and download that zip file for you.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=92.13707692307692) [Go ahead and unzip both of those zip files and head back to your IDE.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=95.214) [Back within your IDE, right-click on the empty space and choose Import,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=100.214) [choose Existing Maven Projects, click Next,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=103.714) [browse to the location of your downloaded zip file,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=106.714) [and click Finish.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=110.88066666666666) [Once you have the weather service imported,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=112.214) [repeat the same process for the weather app.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=113.48672727272731) [I've fast forwarded to the point where I have both](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=115.1370769230769) [projects imported into the IDE.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=117.57763636363636) [We'll start by developing the weather service first,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=119.39581818181816) [so go ahead and expand the weather-service and](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=122.30490909090908) [navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=125.214) [In the main application class, define two new annotations,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=127.01399999999998) [the @RestController annotation and the @EnableDiscoveryClient annotation.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=130.9917777777777) [Then, at the top of the class, define a new string array,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=134.714) [so private String array.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=139.8806666666667) [Go ahead and call it weather,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=141.214) [and then we're going to set that to four different values.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=142.97870588235287) [We're going to say sunny, cloudy, rainy, and windy.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=146.214) [Next, we'll go ahead and define a getWeather method.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=150.214) [So come to the bottom here and type public String getWeather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=153.214) [And this will be our handler method,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=158.214) [so let's go ahead and annotate this with @GetMapping.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=159.82938461538458) [And we'll set the URL to /weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=163.01399999999998) [In the body of the method, we'll choose a random number before 0 and 4 exclusive,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=167.214) [and then we'll use that to pick a random weather value.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=171.54733333333334) [So we'll say int rand = ThreadLocalRandom.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=175.214) [current.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=180.9412727272727) [nextInt and give that a bound from 0 to 4.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=181.7594545454545) [And then next, we'll return weather of rand to pick a random weather value.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=187.48066666666668) [And that's all we have for the coding part of our weather service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=192.92828571428566) [Next, we have a little bit of configuration to do.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=196.04733333333328) [So go ahead and navigate to the src/main/resources and open up the application.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=198.8503636363636) [properties.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=205.21400000000003) [In the application.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=205.61400000000003) [properties, first we're going to set the server.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=206.81400000000005) [port, and we're going to set that to 9000.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=209.839) [And then we're going to set the spring.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=213.214) [application.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=217.57763636363626) [name property, and we're going to set that to weather-service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=218.1230909090908) [And the last property we're going to set is the](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=222.214) [location of the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=224.52169230769226) [So set that long eureka.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=226.714) [client property equal to localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=229.214) [We're now finished with the weather service,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=231.88066666666663) [so let's quickly start it up and make sure that everything works.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=235.52169230769232) [So go ahead and close both of those files and open up the discovery-server.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=239.214) [Navigate to that main application class,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=245.214) [right-click on it, go to Run As, choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=247.21400000000006) [Once the Service Discovery Server is started,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=251.48672727272734) [navigate to the main application class of the weather-service,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=254.65844444444446) [right-click on it, Run As, Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=258.76955555555554) [Next, open up a web browser and visit localhost:9000/weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=263.214) [And just make sure that you get a response here.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=269.214) [You can refresh it a few times to see that you get various responses.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=272.214) [And now that we have our weather service working,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=277.214) [let's head back to the IDE and utilize it within our weather app.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=279.29092307692304) [Back within your IDE,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=283.214) [expand the weather-app and navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=284.9282857142858) [Within the main application class, we're going to define three new annotations.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=289.214) [The first one is the @EnableCircuitBreaker annotation,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=292.214) [the next one is the @EnableDiscoveryClient annotation,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=295.3958181818181) [and the last one is the @RestController annotation.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=299.66854545454544) [Next, we'll define a RestTemplate so that we can call our weather service,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=306.214) [so come down here and say public RestTempate and call it restTemplate.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=309.75246153846155) [Annotate it with the @Bean annotation and the @LoadBalanced annotation.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=316.214) [And then, in the body of the method, return a new RestTemplate.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=322.214) [Now remember a Hystrix command can only be defined in](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=326.214) [an @Component or an @Service class, so let's go up here and create a new class.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=329.2909230769232) [So right-click, go to New, choose Class, and we'll call this the WeatherService.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=335.214) [At the top of the class, go ahead and annotate it with @Service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=342.214) [And then next we'll need our RestTemplate, so private RestTemplate restTemplate.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=347.214) [And make sure that we @Inject that.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=353.214) [And next, we're going to need a method to call our weather service,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=355.21399999999994) [so come below this and type public String getWeather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=360.41400000000016) [Then, in the body of the method, we'll return restTemplate.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=365.214) [getForEntity.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=370.6685454545456) [And the URL we'll use is http://weather-service/weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=371.214) [And then the response type will be a string, so we'll say String.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=380.214) [class.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=384.8568571428568) [And then we'll make sure we call a.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=385.214) [getBody to get the response body.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=388.07114285714266) [This is the method we'll want to annotate with our Hystrix command.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=390.214) [So come up to the top of the method and type @HystrixCommand,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=393.214) [and we'll use a fallbackMethod called unknown.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=398.214) [And then we'll want to make sure that we define that method,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=404.214) [so come below the getWeather method and define a new method,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=406.214) [public String unknown.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=410.214) [And this will be a real simple method.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=411.5776363636363) [It will just return the string unknown.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=415.214) [And just to be crystal clear,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=417.9063076923075) [we're going to use this WeatherService in our main](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=420.214) [application class to get the actual weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=423.48672727272736) [And if there's a problem getting the weather,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=425.464) [or the WeatherService is down,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=427.714) [it'll call that fallbackMethod and just return unknown for the weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=430.214) [Let's head back to the main application class and use the WeatherService.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=434.36784615384624) [So back within the main application class,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=439.214) [define a new instance variable, private WeatherService,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=441.12309090909076) [and we'll call that weatherService.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=445.214) [And then don't forget to add the @Inject annotation.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=450.214) [Then we'll add a new method called getWeather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=454.214) [So come below the main method here and do public String getWeather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=456.214) [And then we're going to return a string here that says the current weather is,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=463.214) [and then we'll call the weatherService and get the weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=468.214) [And this is our handler method, so we'll need the @GetMapping.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=473.214) [So define an @GetMapping on the top of this method,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=477.214) [and then we'll say the URL is /current/weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=480.7854285714283) [And that's all we need for the code portion of our weather app,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=484.214) [so go ahead and close both of these files and navigate to](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=489.6425714285714) [src/main/resources and open up that application.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=494.31399999999996) [properties.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=498.5139999999999) [The properties for the weather app are very similar to](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=499.214) [the ones in the weather service, so I've just copied and pasted those over here.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=501.3568571428572) [And then we're just going to change some of those values.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=506.214) [So for the server.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=508.214) [port, we'll change that to 8000, and for the spring.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=510.0601538461538) [application.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=514.839) [name, we'll change that to weather-app.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=515.464) [We're ready to start our weather app,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=519.214) [so go ahead and close that file and open up the Console.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=521.2140000000004) [Just go ahead and double-check that your discovery server and](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=524.464) [your weather service are still running,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=527.2140000000002) [and then come over to the main WeatherAppApplication class,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=529.214) [right-click on it, go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=533.214) [Next, open up a web browser and visit localhost:8000/current/weather.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=539.214) [And you should get a response here.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=547.214) [And you can refresh it a couple times to see the different values.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=548.7139999999997) [And next, what we're going to do is we're going to shut down the weather service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=552.0601538461536) [And we'll see that Hystrix takes over and recognizes that the weather](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=557.214) [service is down and returns our fallback method.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=561.214) [So we should be able to see the current weather is unknown](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=565.214) [after we shut down the weather service.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=568.6425714285721) [So we're back within the IDE,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=571.214) [and we have the weather service pulled up in the Console.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=573.0601538461536) [We'll go ahead and stop the weather service and head back to the browser.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=576.4447692307691) [Back within the browser, we'll go ahead and refresh the page,](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=581.214) [and we can see instantly that the current weather is unknown.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=584.214) [Hystrix has realized the call to the weather service is failing and it should use its fallback method.](https://app.pluralsight.com/course-player?clipId=ce14ae16-212a-4f4e-b16e-0f1737921b63&startTime=588.214)

### [Metrics and Insight with the Hystrix Dashboard](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce)

[Netflix Hystrix tracks the execution status of protected calls so](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=1.414) [that it knows when to trip the circuit breaker.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=5.959454545454544) [And one of the advantages of this is that we can use those metrics to](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=9.414) [get insight into how our calls are functioning.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=13.414) [Reading those metrics in their raw form wouldn't be very easy or efficient.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=17.414) [And that's where the Hystrix Dashboard comes in.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=22.414) [And the dashboard is a web application that helps you visualize all of](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=25.414) [those metrics in a quick and easy-to-use fashion.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=30.414) [The dashboard is jam-packed with information.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=34.414) [It tracks and displays information about the state of the circuit,](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=37.414) [whether it's open or closed, the error rate for the call,](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=40.414) [the traffic volume that it's receiving, how many requests were successful,](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=44.414) [rejected, or timed out, and the latency percentiles for the call.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=47.914) [And you can also use it to track a single server or a cluster of servers.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=53.414) [To use it, it's literally as easy as declaring a couple dependencies in your pom. xml and adding a single annotation.](https://app.pluralsight.com/course-player?clipId=d3eeaaaf-0816-4137-8730-2d7a83c1c7ce&startTime=59.414)

### [Using Spring Cloud and the Netflix Hystrix Dashboard](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb)

[In order to use the Hystrix Dashboard, you first,](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=2.247) [like always,](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=4.701545454545452) [declare a new dependency within the dependencyManagement section of your pom.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=5.247) [xml on spring-cloud-dependencies.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=11.247) [And, as always again, make sure that it's of type pom and has a scope of import.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=14.247) [Then, still within your pom.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=19.247) [xml, in the dependency section,](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=20.747000000000003) [define a new dependency on spring-cloud-starter-hystrix-dashboard.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=22.247) [And finally, you can probably guess it,](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=29.247) [add the @EnableHystrixDashboard annotation. And that's all you need to get started with the Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=dcc2ed85-9c19-46b8-9ef2-c03470b7f9bb&startTime=33.06518181818183)

### [Reading and Understanding the Hystrix Dashboard](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562)

[Before we get started with the demo of setting up the Hystrix Dashboard,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=2) [it'll be important to understand how to read the dashboard as it contains](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=5.134545454545454) [a lot of information in a very small amount of space.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=10.751428571428573) [We'll focus on the top half under the Circuit heading as the bottom half,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=14.68) [the Thread Pools, is pretty self-explanatory.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=18.251428571428573) [The dashboard is quite literally jam-packed with information.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=21.68) [And it can be a little daunting when you see it at first,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=25.68) [so let's break it down by parts.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=27.68) [At the top right you have the name of the Hystrix call that is being protected,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=29.54666666666666) [and in this picture it's the getCurrentWeather call.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=34.14153846153845) [On the left side, you have a circle that represents both the request volume,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=36.68000000000001) [as well as the health of the call.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=41.603076923076934) [And the larger the circle gets, the more the request volume is,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=44.68) [and the more red the circle becomes, the more unhealthy the call is.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=47.68) [Then on top of the circle,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=52.68) [the line is a depiction of the request rate over the last 2 minutes.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=54.680000000000014) [Back on the right side, beneath the name of the protected call in gray,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=59.10857142857142) [is the error rate of the call.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=63.34666666666668) [And below that you have the number that indicates the](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=65.68) [request per second at the host level, as well as at the cluster level.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=68.18) [Continuing downward, still on the right side,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=72.68) [you have the state of the circuit for this particular call](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=74.43) [and whether it's open and rejecting traffic or whether it's](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=77.3163636363636) [closed and accepting traffic.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=81.45777777777779) [And then right below that you have the latency percentiles for this call.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=83.68) [Moving back to the top,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=87.68) [underneath the name of the protected call are a bunch of](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=89.21846153846154) [numbers in columns with different colors.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=92.67999999999999) [Let's zoom in on this particular area so we can](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=94.68) [explain each of these individually.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=98.01333333333329) [For the numbers, we'll move column by column and row by row.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=99.68) [And, just in case you forget,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=103.68) [there's a legend at the top of the Hystrix Dashboard that looks just like this.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=104.96571428571426) [Starting at the first column in the first row,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=109.68) [the dark green number represents the number of successful requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=111.75692307692304) [And right below that,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=115.68) [the blue number represents the number of short-circuited requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=117.21846153846155) [And these are the requests that didn't even attempt to](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=120.68) [execute because the circuit was open.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=123.18) [Still in the first column, on the bottom row,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=124.91076923076923) [the light green number represents the number of bad requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=127.68) [And these requests are errors,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=130.68) [but they're not necessarily due to an execution failure.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=132.8228571428571) [They're due to something like an illegal argument.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=136.68) [Moving on to the second column, the first row,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=139.68) [the orange number represents the number of timed out requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=142.6800000000001) [And these are requests where the execution was attempted,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=146.68) [but a response was not received in the allotted amount of time.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=149.68) [Right below the timed out request,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=153.68) [the purple number represents the number of rejected requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=155.3163636363637) [And rejected requests happen when there are no more](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=158.28000000000003) [resources to serve a request, either via the thread pool or a semaphore.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=161.60307692307697) [And remember that the request is rejected so that requests don't stack up](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=165.92999999999998) [at the caller and consume those valuable resources.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=171.34666666666664) [And the last number in the second column,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=174.68) [the red one, is the number of failed requests.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=176.3942857142858) [And these are requests that failed to execute because they threw an exception.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=178.77090909090913) [Now that we've got a firm understanding of how to read the Hystrix Dashboard,](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=183.0436363636364) [let's set up and enable our own so that we can visualize some of](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=186.68) [the metrics that are being admitted from the call that we protected with Hystrix in our previous demo.](https://app.pluralsight.com/course-player?clipId=7264972e-920a-4561-835f-daa38ff59562&startTime=190.53714285714278)

### [Demo: Monitoring Fault Tolerance Metrics with Hystrix Dashboard](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4)

[In this demo,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=1.947) [we'll utilize the Hystrix Dashboard to view some of the metrics of the](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=2.8700769230769225) [Hystrix-protected call from the weather app to the weather service.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=7.1008461538461525) [First things first,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=10.947) [if your services and your discovery server aren't already running,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=12.03790909090909) [you'll need to start each of them up.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=15.547) [And we'll start with the discovery server first.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=17.947) [So expand the discovery-server project and navigate](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=20.947) [to the main application class.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=23.863666666666674) [Right-click on it, go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=25.947) [Repeat that same process for the weather service and then the weather app.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=32.947) [I fast forwarded to the point where the weather service and the](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=36.947) [weather app and the discovery server are all running.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=38.947) [And just to double-check,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=42.947) [you can click this little caret and see that each of those services is started.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=44.17776923076923) [Next,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=48.66128571428571) [go ahead and open up a web browser so we can create and](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=48.946999999999996) [download the Hystrix Dashboard project.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=53.67427272727272) [In your web browser, visit start.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=55.947) [spring.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=58.947) [io.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=59.447) [In the Group section, use io.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=59.947) [schultz.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=62.71623076923076) [dustin, and then for the artifact name we'll say hystrix-dashboard.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=63.17776923076922) [And then for the dependencies, we'll type Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=68.16922222222223) [Once you have everything filled out,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=72.947) [go ahead and click the Generate Project button,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=75.947) [and that'll create and download that zip file for you.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=77.947) [Like always, extract that zip file and head back to your IDE.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=80.94699999999997) [Back within your IDE, right-click on the empty space in the Package Explorer,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=85.947) [go to Import, choose Existing Maven Projects,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=89.547) [click Next, click Browse, locate the downloaded zip file,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=93.74699999999996) [and click Open, and click Finish.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=98.17776923076927) [Expand the Hystrix Dashboard project and navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=100.947) [Within the main application class, we will quite literally add one annotation,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=105.947) [and that's the @EnableHystrixDashboard annotation.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=109.947) [Next, we're ready to start things up and view the dashboard.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=114.947) [So on the main application class, right-click on it,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=117.947) [go to Run As, choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=121.40853846153848) [Next, open up a browser and visit localhost:8080/hystrix.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=125.947) [This should load up the Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=131.947) [And before we view any metrics, we'll need to actually generate some metrics.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=133.947) [So open up a new tab and visit your weather app at](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=138.947) [localhost:8000/current/weather.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=147.25469230769215) [And just go ahead and refresh that a few times to get some metrics generated.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=147.947) [Back at the Hystrix Dashboard,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=152.947) [we'll put in the URL to the Hystrix stream of our weather app.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=154.4854615384616) [So that's http://localhost:8000/hystrix.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=162.50255555555557) [stream.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=165.83588888888892) [And for the title of our dashboard, we'll say Weather App.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=166.947) [Next, click the Monitor Stream button,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=170.947) [and you should be presented with some metrics.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=173.12881818181825) [If you don't see metrics right away,](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=175.63930769230768) [you can flip back and forth between your weather app and](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=177.25469230769227) [refreshing it to generate some metrics and back to the dashboard to see the effect of those requests.](https://app.pluralsight.com/course-player?clipId=80e21a90-bf10-432b-a9c3-c8e8f57b3de4&startTime=180.61366666666675)

### [Aggregating Hystrix Metrics with Netflix Turbine](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81)

[Hystrix metrics are tracked on a service-by-service basis.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=2) [Now a single Hystrix stream might have metrics on more](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=5.814) [than one Hystrix protected call, but those metrics are only for that service.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=9.147333333333334) [And the implications of this are that every service has its own Hystrix stream](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=14.814) [URL that you need to use if you want to consume its metrics.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=18.480666666666664) [If you wanted to track the metrics for multiple services,](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=22.814) [you'd have to open up multiple Hystrix Dashboards and track them independently.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=26.814) [And I'm sure you can imagine how big of a pain that would be if you had tens](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=31.814) [or even hundreds of services that made up your application.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=36.48066666666667) [To solve this,](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=39.814) [Netflix developed a tool called Turbine that](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=40.9049090909091) [aggregates many Hystrix streams into one.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=43.45036363636367) [To give you a better understanding of how this might look,](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=46.814) [let's look at a screenshot from the Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=49.814) [In the screenshot, you can see there are two protected calls,](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=52.814) [the getCurrentWeather call and the getCurrentDatetime call.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=55.814) [And the protected call on the left is from a service located on localhost:8080,](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=59.814) [and the one on the right is from another service located on localhost:8181.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=64.26854545454546) [And Turbine has brought both of these metrics together from different services, all viewable in the same dashboard.](https://app.pluralsight.com/course-player?clipId=68d041ef-56f3-4a13-8dd2-2e6612622a81&startTime=70.61399999999998)

### [Using Spring Cloud and Netflix Turbine](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071)

[So how do we start using Turbine?](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=1.481) [Well, if you've been following along throughout the course,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=3.8143333333333342) [you can probably already guess.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=6.814333333333332) [You start by defining a new dependency on spring-cloud-dependencies](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=8.481) [in the dependencyManagement section of your pom.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=12.081000000000003) [xml.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=15.909571428571427) [As always, make sure that it's of type pom and has a scope of import.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=16.481) [Then, still within your pom.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=20.481) [xml, in the dependency section,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=22.480999999999995) [define a new dependency on spring-cloud-starter-turbine.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=24.481) [Follow that up by adding a new annotation to your main Application class,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=29.481) [the @EnableTurbine annotation.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=33.935545454545455) [And last, we have a little bit of configuration to add.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=35.299181818181815) [In your application.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=40.080999999999996) [properties or your application.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=41.28099999999999) [yml, we're going to add two new properties.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=42.925444444444445) [The first property is the turbine.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=46.481) [app-config property, and you set this to a comma-separated list of service IDs.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=49.20827272727272) [And these are the same service IDs that you use for service discovery.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=54.481) [The second property, the turbine.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=59.481) [cluster-name-expression property,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=62.33814285714285) [can be a Spring Expression Language value to name your cluster.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=63.481) [And in Turbine,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=68.481) [a cluster is just a grouping of services that need to be monitored together.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=69.12385714285712) [And for our purposes, to make things easy,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=72.84463636363635) [we're going to set that value to default surrounded by single quotes.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=76.481) [And a note here is if you're using YAML instead of properties,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=81.481) [you'll need to escape the single quotes with double quotes.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=84.481) [Once you have everything configured and your Hystrix Dashboard is started up,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=88.481) [instead of entering the hystrix.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=92.36988888888888) [stream URL, you'd enter the URL of your Turbine server and end it with turbine.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=94.5921111111111) [stream.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=101.05242857142859) [Let's apply the stuff we learned by created our own Turbine server,](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=101.481) [and we can use it to aggregate the stream of our service we created in the previous demo along with a new service.](https://app.pluralsight.com/course-player?clipId=21f01985-2c9f-46e9-b958-ef2e37445071&startTime=104.481)

### [Demo: Aggregating Multiple Hystrix Streams with Turbine](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250)

[In this demo,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=1.214) [we'll utilize Turbine to combine the Hystrix streams from](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=2.3049090909090912) [two different services so that they're both viewable from](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=5.486727272727273) [the same Hystrix Dashboard.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=7.941272727272725) [We'll continue to utilize the weather app,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=9.414000000000001) [the weather service, and the discovery server from our previous demo,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=12.214) [and then we'll add two new projects that you can clone from GitHub.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=16.214) [The first new project is the datetime-service, and you can get that from github.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=20.214) [com/dustinschultz/scf-hystrix-datetime-service.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=29.214) [And the second new project is the datetime-app.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=32.214) [And you can get that, again, at github.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=35.214) [com/dustinschultz/scf-hystrix-datetime-app.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=44.10288888888891) [Once you've cloned both of those projects,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=45.214) [make sure that you import them into your IDE.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=46.964) [I fast forwarded to the point where I've imported mine,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=49.444769230769225) [and your IDE should look pretty similar to this.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=52.513999999999996) [The two new projects, the datetime-app and the datetime-service,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=55.214) [are literally identical to the weather app and the weather service,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=59.214) [with the exception that they return the current datetime instead of the weather.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=63.214) [So feel free to browse around and check out the code for those.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=67.214) [We'll need to start each of these applications](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=71.214) [starting with the discovery server first.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=73.39581818181813) [Again,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=75.30490909090908) [I've fast forwarded to the point where I have all of the applications started.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=75.66854545454544) [And feel free to pause the video to give yourself](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=80.36784615384614) [time to get all of yours started up.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=83.54733333333331) [And once they're all started up,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=86.214) [you can verify by clicking this little caret and making](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=87.714) [sure that all of the applications show up.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=90.88066666666668) [With all of the applications started,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=94.214) [we'll go ahead and start building our Netflix Turbine app.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=95.30490909090912) [Open up a browser and visit start.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=99.214) [spring.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=102.3251111111111) [io.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=102.76955555555554) [In the Group use io.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=103.214) [schultz.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=105.35685714285715) [dustin, and for the artifact name you can just call it turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=105.78542857142858) [And for the dependencies, we'll obviously want to add Turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=110.66854545454544) [And once you have everything filled out,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=114.11399999999999) [click that Generate Project button,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=116.214) [and that'll create and download that zip file for you.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=118.21400000000003) [And, like always, unzip that zip file and import that into your IDE.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=121.75246153846153) [We're back within the IDE where we've imported the Turbine project.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=126.214) [Go ahead and expand the project and navigate to the main application class.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=130.214) [In the main application class, we'll add one new annotation,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=135.214) [and that's the @EnableTurbine annotation.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=139.214) [Next, we'll need to configure some properties,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=143.214) [so go ahead and close that file and navigate to src/main/resources,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=144.964) [application.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=149.964) [properties.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=150.589) [In the application.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=151.214) [properties, we have a number of different properties to set,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=152.11400000000003) [so I'm going to go ahead and paste those in here,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=155.07114285714283) [and then we're going to go through each one of them one by one.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=158.214) [The first property, the server.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=161.214) [port, we're going to set that to 3000.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=163.13707692307693) [The next property, the application.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=166.214) [name, we're going to call turbine-aggregator.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=168.03218181818187) [And then the third property, the eureka.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=170.214) [client.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=173.3251111111112) [service-url, set that to localhost:8761/eureka.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=173.76955555555566) [And then below that, we have the two turbine properties.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=176.39581818181813) [And remember the first one, the turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=181.339) [app-config property,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=184.5473333333333) [sets the applications or services that you want Turbine](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=185.88066666666663) [to aggregate together as a stream.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=191.214) [In our case, we want the weather-app and the datetime-app.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=194.214) [And then the last property, the turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=197.214) [cluster-name-expression, we just set that to default surrounded by single quotes.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=200.714) [And that's all for our properties, so go ahead and close that file,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=205.214) [and then we're going to go ahead and start the Turbine application.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=208.214) [So come over to the main application class,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=212.214) [right-click on it, go to Run As, and choose Spring Boot App.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=214.39581818181824) [Next, open up a web browser,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=220.214) [and we're going to visit the datetime app and the weather app](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=221.92828571428566) [to generate some metrics for their Hystrix streams so that](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=226.214) [Turbine can them collect them.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=230.92828571428572) [So let's visit the datetime app first.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=232.71400000000003) [So go to localhost:4000/current/datetime.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=235.214) [And just refresh that a few times to generate some metrics.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=241.214) [And then we're going to do the same thing for the weather service,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=246.214) [so go to localhost:8000/current/weather,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=249.214) [and then also refresh that a few times to generate some metrics.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=252.41400000000004) [Next, open up a New Tab and visit localhost:8080/hystrix.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=259.356857142857) [And this time, instead of putting in the hystrix.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=262.99177777777777) [stream URL, we'll use the turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=269.76955555555554) [stream URL.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=273.1028888888888) [So go ahead and type http://localhost:3000/turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=274.214) [stream.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=282.78542857142867) [And then in the Title textbox just type Turbine.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=284.214) [After that, click the Monitor Stream button,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=288.214) [and you should see metrics from the datetime app,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=290.12309090909076) [that's the getCurrentDateTime call,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=293.9917777777777) [and you should also see metrics from the weather app,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=296.214) [and that's the getWeather call.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=299.54733333333314) [And if you don't,](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=301.214) [just go back to those services and refresh them a few times to generate some metrics.](https://app.pluralsight.com/course-player?clipId=10c186c9-b2c3-4e1c-b0e1-b9486b21c250&startTime=302.0711428571429)

### [Summary](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359)

[We're at the end of this module so, like always,](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=2) [let's do a recap of what we learned.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=4.831333333333333) [First, we saw that failures in a distributed system are pretty much inevitable.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=7.246999999999999) [And we have to learn to embrace failures and make](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=11.913666666666664) [handling failures a requirement.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=16.247) [Then we introduced Netflix Hystrix,](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=18.247) [which is an implementation of the Circuit Breaker pattern,](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=20.547) [among other fault-tolerance patterns.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=23.247) [And we saw how to use the @EnableCircuitBreaker annotation and the](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=24.701545454545453) [@HystrixCommand annotation to protect a call that might fail.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=30.67557142857143) [We concluded the module by looking at how we can visualize and monitor](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=35.09315384615384) [our Hystrix-protected calls with the Hystrix Dashboard and how we can monitor several streams at once with Turbine.](https://app.pluralsight.com/course-player?clipId=751869f5-dce1-443b-a5e2-0f170f00c359&startTime=39.83954545454546)

## [Bringing It All Together and Where to Go Next](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36)

### [Introduction](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36)

[Hi, my name's Dustin Schultz,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=0) [and in this last module we'll take a holistic approach to see how each of](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=1.9230769230769231) [the individual ideas and technologies all fit together and where you can](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=7.545454545454543) [go next after you've completed the course.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=12.333333333333329) [We'll begin with a section on how it all fits together.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=16) [We've learned a lot throughout the course covering new ideas](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=20) [and technologies in every single module.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=22.727272727272734) [And while many of those ideas are useful by themselves,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=24.818181818181817) [the real advantage comes from using them together as a whole.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=28.818181818181813) [And we'll see how each of the main topics,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=33.230769230769226) [service discovery, distributed configuration,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=36) [client-side load balancing, gateway and routing,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=38.66666666666666) [and fault tolerance and circuit breaker,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=41.77777777777777) [all fit together to form a cloud-native system.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=44.44444444444444) [And then, like I mentioned,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=48) [we'll finish by briefly discussing where you can go next to learn about](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=49.36363636363637) [what additional Spring Cloud projects are out there.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=53.91666666666665) [And don't discount the importance of this.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=56.89999999999999) [It's helpful to know exactly what's out there.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=59) [It's almost like browsing the tool section at your local hardware store,](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=62) [and if you don't know what tools are out there, when you have a problem, you might end up using the wrong tool for the wrong job.](https://app.pluralsight.com/course-player?clipId=14a01e2f-1c69-4037-8c8d-76252b903f36&startTime=66.26666666666667)

### [How Does It All Fit Together?](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405)

[The question is how does it all fit together to form a cloud-native system?](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=2.133) [And, to start, let's recap everything that's involved.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=7.133) [It all starts with one or more application services.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=11.133) [And in our example here we have two application services,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=14.133) [application Service A and application Service B,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=18.133) [and both of them are running multiple instances.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=21.049666666666674) [Then, at the heart of everything is the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=24.22390909090909) [It's the phonebook or the directory of the system allowing](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=28.22390909090909) [everyone to register their location, as well as discover the location of others.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=32.133) [And remember that we utilized Netflix Eureka throughout the](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=37.63299999999999) [course for our service discovery needs.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=41.133) [Next,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=44.133) [we have the Config Server to handle our dynamic and](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=44.56157142857143) [distributed configuration needs.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=48.84728571428574) [And remember that we use the Spring Cloud Config Server for this.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=50.133) [After that, we have the gateway, or the front door,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=55.133) [of the system,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=57.44069230769234) [and it's responsible for receiving and routing requests to back-end services.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=58.133) [And we use Netflix Zuul for this.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=64.133) [Then we have a client-side load balancer to distribute requests among the](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=66.28684615384614) [multiple instances that we run for high availability purposes.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=71.133) [And remember in our case we used Netflix Ribbon.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=75.27585714285715) [And last,](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=79.133) [we have fault tolerance to be able to tolerate and measure failures and](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=79.74838461538461) [prevent them from causing cascading failures to other systems. And we use Netflix Hystrix for this.](https://app.pluralsight.com/course-player?clipId=c78a5c8b-a7d8-47da-b4e9-6475e81b3405&startTime=84.22390909090909)

### [Putting It All Together: On Startup](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88)

[Now that we've recapped all of the pieces involved,](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=1.666) [let's take a moment to look at how they all interact with each other,](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=3.916) [specifically on startup.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=8.666) [It all starts with the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=11.666) [Each and every instance of every piece of the system registers itself](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=13.666) [with the Service Discovery Server upon startup.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=18.666) [And then it also receives a reply with the location](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=21.666) [of other registered services.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=25.95171428571427) [For application services,](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=27.666) [this reply is very important because it tells them where the](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=28.865999999999996) [location of the Configuration Server is at.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=33.12054545454545) [And once they know the location of the Configuration Server,](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=35.666) [they can make a request to retrieve any configuration that will ultimately be used to bootstrap their startup process.](https://app.pluralsight.com/course-player?clipId=6e53a4c4-528a-4a16-8deb-8f00ea19ca88&startTime=39.666)

### [Putting It All Together: On Request](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf)

[Now that we have all of our application and their supporting services started,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=2.299) [let's look at how they all interact with each other during a request.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=5.727571428571429) [The request for a given path begins at the gateway server,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=11.299) [Netflix Zuul in our case.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=14.299) [And Zuul will match the path to a given service ID,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=16.084714285714288) [and then it will use service discovery,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=20.187888888888885) [either by requesting it from the Service Discovery](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=23.299) [Server or via a previously cached result,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=25.299) [to locate the service that will handle that path.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=27.799) [Once the service is located,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=32.299) [it'll make a Hystrix-protected call to the service using](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=34.117181818181834) [Ribbon to handle the client-side load balancing of which](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=37.66263636363636) [instances it should send the traffic to.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=41.674) [In our example, the request was sent to Service A.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=44.299) [Now, suppose that Service A also depends on Service B to fulfill the request.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=47.299) [Upon receiving the request,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=53.299) [Service A will utilize service discovery to locate Service B.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=55.299) [And it'll do that either via a previously cached result or by](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=59.83746153846155) [requesting it from the Service Discovery Server.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=64.49900000000001) [Next,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=67.299) [it'll make a Hystrix-protected call using Ribbon for client-side load](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=67.799) [balancing to one of the instances of Service B.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=72.69900000000001) [Service B will respond to Service A,](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=76.299) [and then Service A will respond to the gateway, and finally, the gateway will respond to the original request.](https://app.pluralsight.com/course-player?clipId=63fee92f-9bf8-4bd2-a249-3b727ad039cf&startTime=78.45284615384615)

### [Where to Go Next](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae)

[Throughout the course,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=1.899) [we've covered the core fundamentals of Spring Cloud and](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=2.7989999999999995) [given you a good foundation to build upon.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=5.699) [And remember that Spring Cloud is a conglomerate of projects,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=8.899) [and while the fundamentals that we covered was a lot of information to learn,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=12.899) [they only represent two of the many pieces of Spring Cloud.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=17.899) [And that's the Spring Cloud Config project and the Spring Cloud Netflix project.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=22.899) [There are a whole bunch of other projects like Spring Cloud Bus,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=27.899) [Spring Cloud Cluster,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=31.899) [and Spring Cloud Stream that all help you solve problems in the cloud.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=33.148999999999994) [To get the best idea of what's available with Spring Cloud,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=38.899) [visit the documentation page at http://projects.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=41.899) [spring.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=49.399) [io/spring-cloud,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=50.649) [and then scroll down to the section with the heading Main Projects.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=51.899) [Here you'll find all of the Spring Cloud projects that](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=56.899) [sit under the Spring Cloud umbrella.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=59.97592307692307) [And I encourage you to check them out,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=61.71718181818182) [if only so that you're familiar with them and you know that they exist because,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=63.899) [like I mentioned before,](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=68.23233333333333) [it can be really helpful to know what tools exist so that](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=69.56566666666664) [you use the right tool for the right job.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=73.6847142857143) [I hope you've enjoyed the course and will find Spring Cloud](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=76.899) [useful in your work and personal projects, and thank you for watching.](https://app.pluralsight.com/course-player?clipId=aea6762f-73d1-4133-be6e-55b34a2a8cae&startTime=79.43746153846149)