



# The State of Spring 2020

Presented by: VMware



# Introduction

The open source Spring Framework and Spring Boot are now the de-facto standard for enterprise Java. Since its inception in 2004, Spring's developer-centric model has grown and evolved to bring new technologies and innovations to Java developers, saving them from having to learn new languages and frameworks. Spring's focus on speed, simplicity and productivity has made it the world's most popular Java framework.<sup>1</sup>

The introduction of Spring Boot in 2014 further served to boost adoption of Spring, with innovations including simple code annotations, a convention-over-configuration approach for sensible defaults, simplified dependency management, and deployment flexibility. The productivity gains offered by

Spring Boot are so popular that many developers talk about “Spring Boot Apps” and “Spring Boot modules” as a shorthand for the capabilities across the Spring ecosystem.<sup>2</sup>

Spring Cloud builds on the developer-centric approach, bringing distributed application patterns to their fingertips with microservices patterns, streaming data orchestration, and a self-service API gateway.

With this study, we wanted to understand the current state and trajectory of Spring among developers and enterprises, the factors driving its success, and challenges to be addressed.

## This report is divided up into four sections:



### Trusted and Growing

Enterprise adoption is broad and still growing



### Bridging to the Cloud

Spring developers are deploying containers to Kubernetes and every cloud



### Ride Every Wave

Spring supports the latest programming models and technologies



### It's About Community

Developers love Spring's open source roots and massive ecosystem

1. <https://snyk.io/blog/spring-dominates-the-java-ecosystem-with-60-using-it-for-their-main-applications/>

2. In this study, we also use the term “Spring Boot” as a catch-all for the Spring Framework plus Spring Boot.

# Demographics

Our study surveyed active Spring Boot developers, architects and managers across organizations of different sizes and industries. VMware commissioned Dimensional Research to conduct the study to understand the experiences and attitudes of the individuals responsible for adoption and use of Spring in each organization.

The research effort included a total of 1,024 individuals, all of whom have a role that involves daily use of Spring. A wide range of roles, industries, regions, and job levels are represented.

The vast majority (77%) of those surveyed had over 3 years of experience working with Spring Boot. One third identified themselves as a “Spring Specialist” for their organization—responsible for keeping their team up to date on the latest developments in the Spring ecosystem.

This research covers a wide range of Spring stakeholders including technology companies (30%) and financial services companies (20%). All major sectors are represented, including retail (8%), services (6%), and healthcare (5%).

## Role

Architecture **22%**



Development Manager **19%**



Hands-on development **59%**



## Years of experience with Spring Boot

Less than 1 Year **5%**



1-2 Years **18%**



2-5 years **46%**



More than 5 Years **31%**



## Region

EMEA **49%**



North America **32%**



APAC **14%**



LATAM **5%**



## Company Size (Employees)

<100 **13%**



100-500 **20%**



500-1,000 **10%**



1,000-5,000 **21%**



5,000-10,000 **9%**



>10,000 **28%**



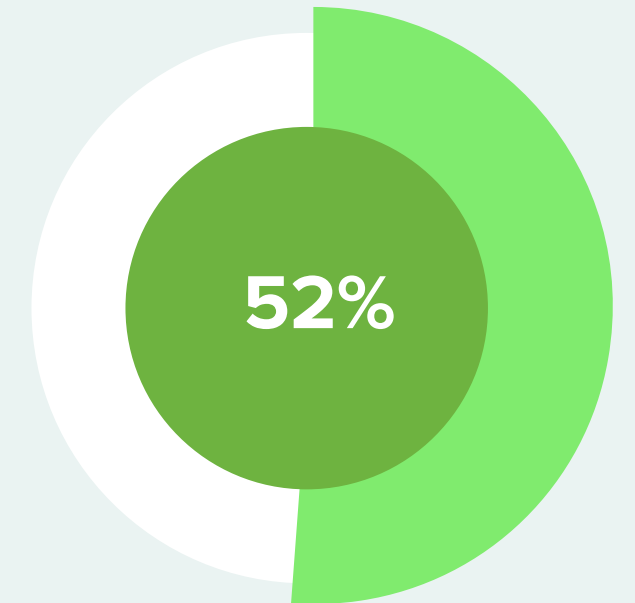


# Trusted and growing

Building on a 16-year pedigree, Spring is trusted by enterprises that depend on its convention-over-configuration philosophy to make developers more productive. As a result, it's a top choice for organizations embarking on new projects and migrating existing applications to a cloud native platform.

## Spring is the primary development platform for a majority of organizations surveyed

The past ten years has seen a rapid proliferation and diversification of development platforms. Spring has shown surprising strength and resilience in the face of newer upstarts. Over half (52%) of respondents use Spring as their only (6%) or primary (46%) development platform, with a further 42% using it extensively along with other platform options. Larger organizations (> 500 employees) are more likely to use multiple development platforms. More than a third (37%) expected Spring apps to last 2-5 years, while a further 31% expected an app lifetime of 6-10 years.



52% of developers surveyed use Spring boot as their only or primary development platform

## Spring usage continues to grow, driven by new project starts

Spring Boot has been a development standard at enterprises for many years, and with that comes a vast installed base of existing apps, many mission-critical. However, maturity doesn't show any signs of holding back the growth and enthusiasm for the platform. 75% of respondents expect to increase their use of Spring over the next 2 years, with a further 18% continuing to use Spring at the same level. While you might reasonably expect this growth to come from maintaining and enhancing existing Spring Boot applications, the majority of this growth will come from new projects (82%), followed by enhancements to existing apps (56%), and migration of legacy apps (53%).



**75%**

of respondents expect Spring Boot usage to grow over the next 2 years



**82%**

of respondents say Spring Boot is growing because of new project starts

## APIs all the way

Traditionally, Spring was known for web development, but usage patterns have shifted with the industry, driven by modern software architectural patterns such as cloud native and microservices. By far the largest use case for Spring is now development of internal and external APIs, cited by 76% of respondents. Other popular uses include dev/test experimentation, mobile backend development, and data pipelines. Customer-facing websites, once a staple of Spring, ranked fifth at 39%.

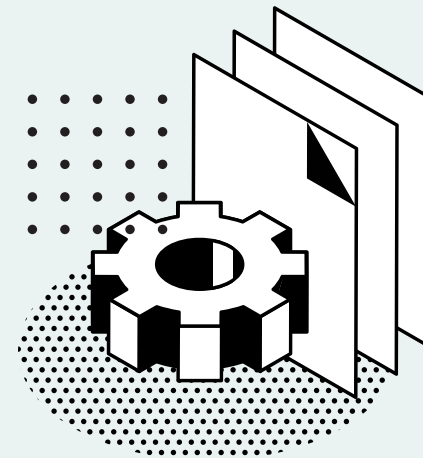
### Top types of applications being built in Spring Boot



## Works out-of-the-box, but customizable when needed

Developers love to create, building new apps and capabilities to delight customers and stakeholders. However, the reality of software development can include a lot of toil—learning obscure formats and executing mundane, repetitive technical tasks that make an app work but add no unique business value. Spring Boot is different, taking an opinionated view of configuration that works for a majority of situations, with the option to customize. Developers love the fact that Spring Boot works out-of-the-box (70%). Survey respondents also appreciate that the tool is stable, scalable and secure (64%). Further, many like that Spring Boot offers a straight line to productivity (61%).

When asked about challenges with Spring Boot, 39% struggle to understand what all the components do and how to apply them, while a smaller group are looking for greater runtime efficiencies for their Spring-based applications, mentioning startup time (34%) and memory usage (25%) as focus areas. Recent releases of Spring Boot have included enhancements to improve efficiencies on Hotspot and improve compatibility with native executable compilation tools such as GraalVM. As native-executables/static-images, Spring Boot applications offer near instant startup and vastly reduced runtime memory footprint. 15% said they didn't face any challenges with Spring Boot.



**“I once hated anything to be opinionated, felt I lost control over controlling and micromanaging my software, until Spring Boot came in this space. I love how Spring is opinionated and yet is flexible and controllable as needed.”**

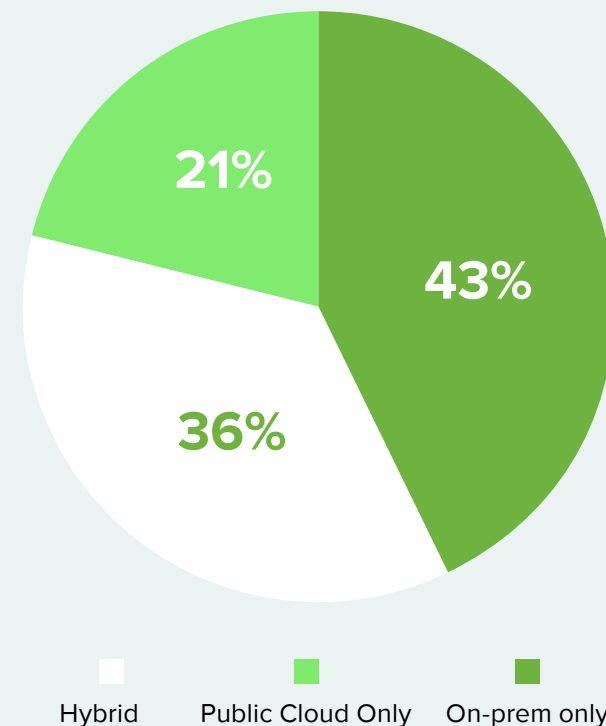


# Bridge to the cloud

Today's discussion about cloud is about much more than simply where applications are running: on-premises or public cloud. It also embraces a range of infrastructure and virtualization technologies and provisioning models, as well as physical locations. With so many cloud options available, Spring Boot helps developers stay productive while deploying to the cloud and bridges the gap between traditional infrastructure and public cloud, containers and Kubernetes.

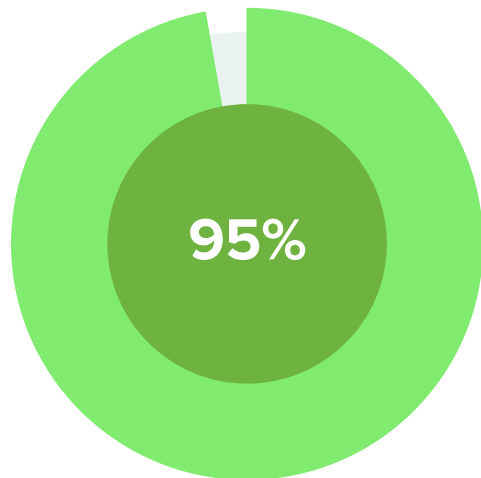
## Most Spring developers have some public cloud deployments

When asked where they deploy their Spring Boot apps, 57% of respondents were either deploying exclusively to public cloud (21%) or in a hybrid mode with both on-prem/private and public cloud deployments.



## Spring Boot app containerization is more advanced in hybrid and public cloud deployments

Almost all respondents (95%) will containerize their Spring Boot apps, with 65% already doing so and a further 30% planning to. Respondents with public cloud deployments are much more likely to already be containerizing. Spring Boot capabilities (supported by Paketo build packs) have recently been extended to allow containerization of native-image compiled applications on a minimal underlying base image.

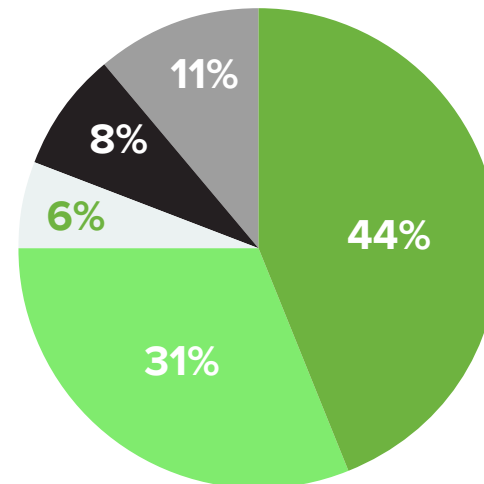


**95%**  
of developers are  
already, or plan to  
containerize their  
Spring Boot Apps

## Kubernetes will lead deployments in the next 12 months

Once Spring Boot applications are containerized, developers and their partners on the DevOps team switch focus to the most efficient and flexible place to deploy and run the containers. For this, there is only one game in town: Kubernetes. Of the 95% of Spring users that are containerizing their apps, 44% have already deployed on Kubernetes, and a further 31% plan to do so within the next 12 months.

### Containerized Spring Boot Apps deployed to Kubernetes



- Already deploying to Kubernetes
- Plan to deploy to Kubernetes in next 12 months
- Longer term plans to deploy to Kubernetes
- Too soon to say
- Not planning to deploy to Kubernetes





# Ride every wave

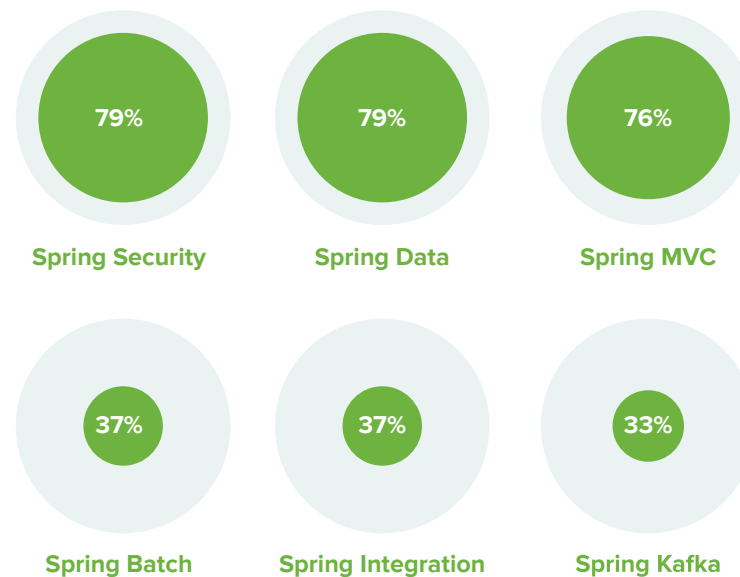
One of the keys to Spring Boot's enduring appeal and reputation for innovation is that it helps developers stay up to date with modern technologies without being forced to learn new languages or frameworks. Over the life of the platform, new modules have been added—and old ones deprecated—to keep pace with the latest development techniques and technologies.

## Honorable Mention: Webflux

Many of those surveyed wrote-in their own favorite modules in response to this question. Most notable was WebFlux, with 17 mentions. WebFlux supports reactive HTTP and WebSocket clients as well as reactive server web applications including REST, HTML browser, and WebSocket style interactions.

## Security, Web and Data are at the top of the charts

The modules in the Spring Boot portfolio offer a huge library of capabilities. You probably have your own favorites, but here are the chart toppers:

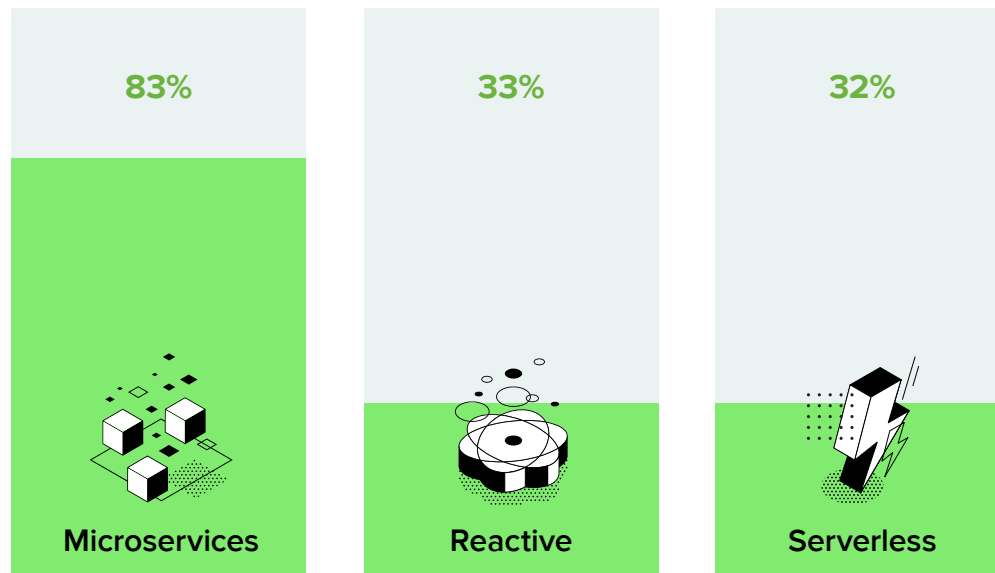


## Spring Boot makes microservices easy. Reactive and serverless are next.

When it comes to developing and deploying cloud native applications, Spring Boot took the hard grind out of microservices, enhanced by Spring Cloud which can greatly simplify distributed computing. The majority of Spring Boot developers are now using microservices.

Spring Boot now includes support for reactive architectures through Project Reactor and for serverless functions through Spring Cloud Function, helping developers take advantage of the latest programming models.

### Development Styles Used

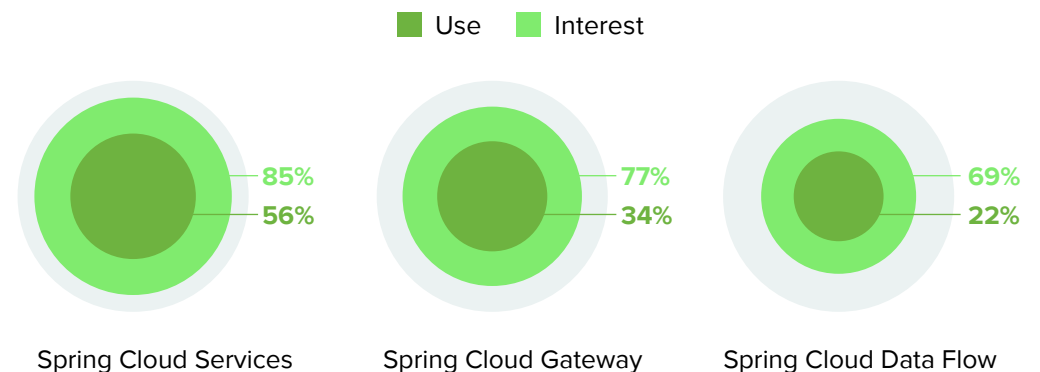


## Spring Cloud Services piques interest; API Gateway and Data Flow too

Spring Cloud leverages Spring Boot, implementing services and patterns to help deploy distributed cloud native applications at scale. Originally inspired by technology developed at Netflix to power its ground-breaking microservices, Spring Cloud offers a set of services such as Service Discovery, Config Management, Circuit Breaker, API gateway, and batch and streaming data processing. A majority of survey respondents (85%) are already using, or considering use of these capabilities.

69% of respondents indicated their interest in Spring Cloud Data Flow, an orchestration engine for stream and batch processing with a rich graphical design environment. Spring Cloud Gateway, a recent addition to the Spring Cloud portfolio providing developer-centric API gateway capabilities, demonstrates rapid adoption (34%) and high levels of interest (77%) in the survey.

### Spring Cloud Adoption and Interest





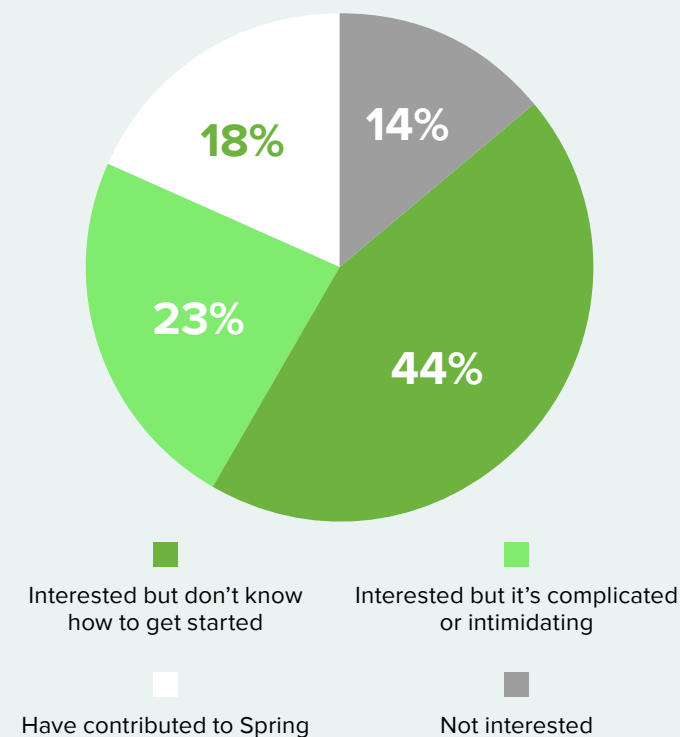
# It's about community

Respondents recognize that the scale, strength and diversity of the open source Spring ecosystem is one of the greatest assets of the platform. Developers are actively engaged in the community for the greater good, providing assistance and documentation on various forums and social channels. Spring Boot users are also very keen to get involved with the product. While 18% of respondents have already contributed code to Spring, a much larger group (67%) would like to contribute if they can find help to get started. New contributors to Spring can get started by searching for specially tagged 'first-timers-only' bugs in the github repository for various projects, e.g., [spring-boot](#).

## Open source is key

Open source software is trusted by developers and enterprises, and Spring Boot is fully open source, which is the top reason respondents like using it (74%). Developers also know that they can rely on Spring's large and active community for support and expertise (65%). When developers need help with Spring, Spring.io and Stackoverflow are the top resources, but search and Baeldung are also important sources of information.

Interest in contributing code to Spring Community



# Summary and recommendations

If your organization is already using Spring Boot, or considering adopting it, what lessons should you take away from this survey? The landscape for developer platforms is constantly evolving, with new languages, frameworks, patterns, and methodologies clamoring for the attention of developers, architects and managers alike. Yet, in this busy environment, Spring Boot continues to thrive, with 76% of developers expecting Spring Boot usage to grow and 82% forecasting that growth will be led by new project starts.

Organizations are using Spring Boot to deliver production results day after day, even as new cloud and container infrastructure becomes the norm. Cloud, containerization and Kubernetes are already key priorities for developers, and Spring Boot is providing a bridge to new infrastructure that doesn't impact their productivity. In fact, migration of containerized Spring Boot apps to Kubernetes is well underway, and most plan to complete the migration in a 12-month time window. Enthusiasm for GraalVM is also growing, with 14% already using it to some degree whilst another 26% plan to use it, enabling a reduction in memory usage and faster startup times.

Spring usage continues to grow, while the open source community is thriving. The majority are excited at the opportunity to get involved and contribute to Spring Boot, albeit they need some help getting started.

Enterprises should confidently adopt Spring Boot as their platform for app workloads. Over 90% of survey respondents agreed that Spring Boot is the future of enterprise Java, with 93% praising its innovation and productivity compared with other options.



Visit [Spring.io](https://spring.io) for all the resources, training, documentation, and much more as you continue your journey into the world of Spring.