

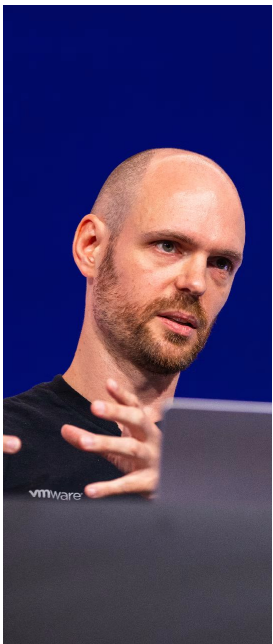


New features in Spring Boot 4

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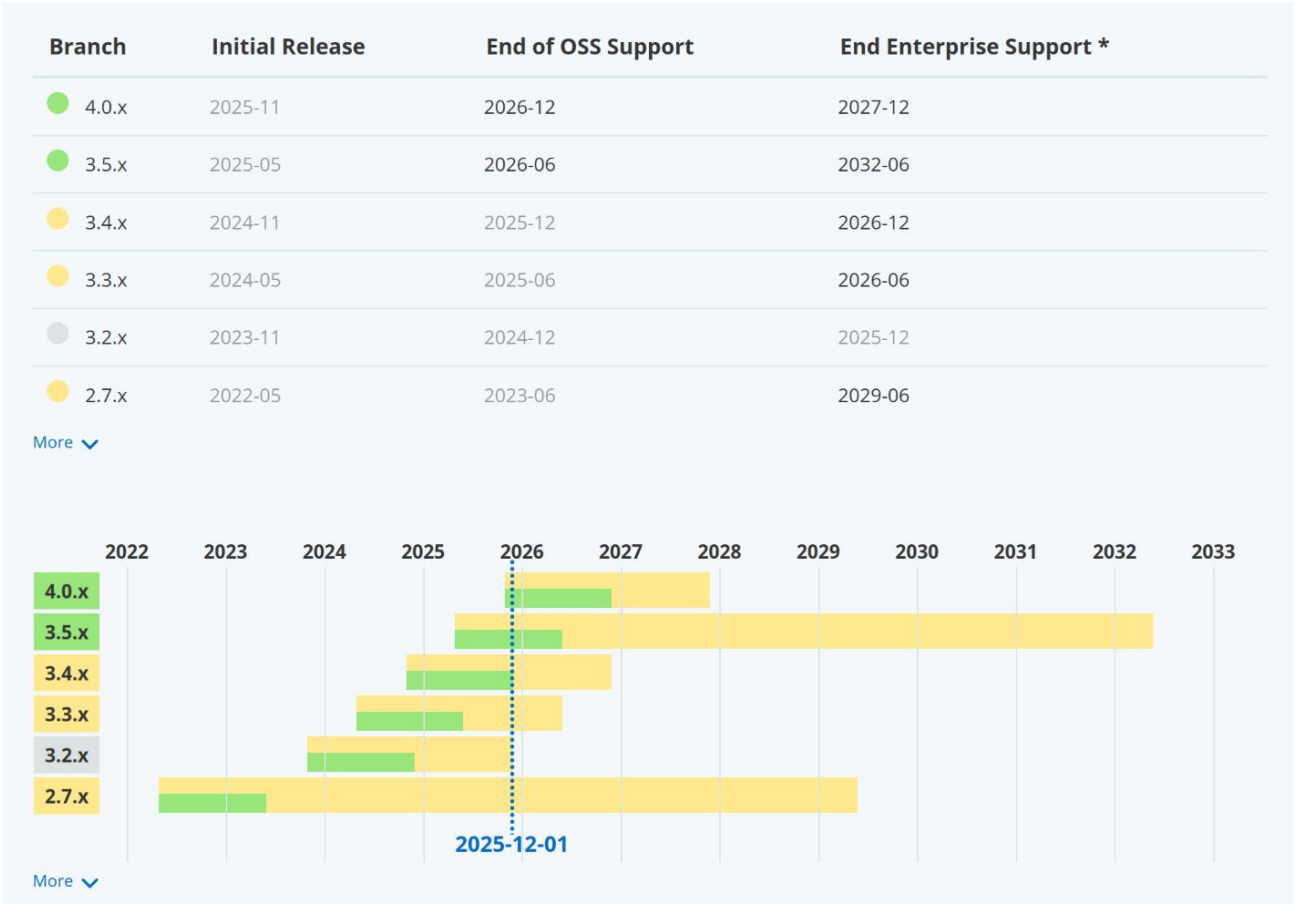
About me



git log

- GraalVM native image support
- Observability
- Docker Compose & Testcontainers support
- Virtual threads
- SSL hot reload
- CDS, SBOM
- Structured Logging
- JSpecify Nullability
- ...

4.0 has been released!



Spring Framework Baseline upgrades

- Java 17 baseline unchanged but Java 25 recommended
- Kotlin 2.2
- GraalVM 25 with the new reachability metadata format
- JPA 3.2 (Hibernate ORM 7.1)
- Bean Validation 3.1 (Hibernate Validator 9.0)
- Netty 4.2
- JUnit 6
- JSONassert 2.0

New features

- [JSpecify null-safety support](#)
- [Modularization of the auto-configuration](#)
- [Jackson 3](#)
- [OpenTelemetry Starter](#)
- [HTTP Service Clients](#)
- [API Versioning](#)
- Liveness and Readiness probes enabled by default
- Kotlin Serialization
- Support for RestTestClient
- And all the features of upstream projects like Spring Data, Spring Security, Spring Framework, etc.
- ...

Null Safety portfolio-wide!



**Spring
Boot**



**Spring
Framework**



**Spring
Data**



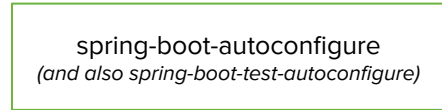
**Spring
Security
(partial)**



**Spring AI
(2.0)**

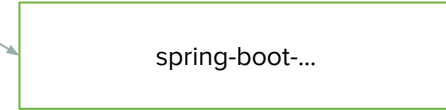
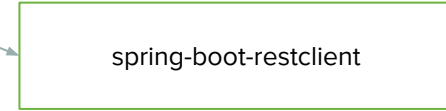
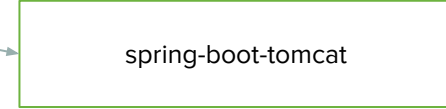
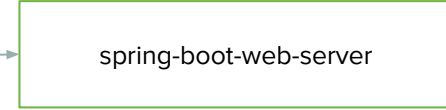
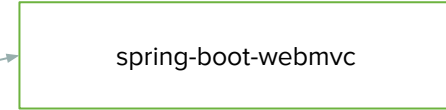
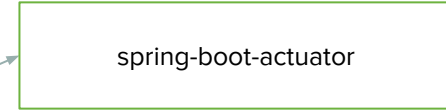
Spring Boot Modularity

Spring Boot 3.x



Contains all auto-configurations
for all supported libraries

Spring Boot 4.x



One auto-configuration library for
every supported dependency

Why?

- Less clutter in auto-completion for classes and properties
- Better signal for auto-configuration, e.g.:
 - having webflux on the classpath just for webclient doesn't configure a reactive web server
 - having Spring Security on the classpath doesn't configure a `SecurityFilterChain`
- New features
 - E.g. metrics and tracing without the need for spring-boot-actuator
- Slightly smaller JARs for you
 - Only include what's needed
- Improved maintainability of the Spring Boot codebase
 - More isolated changes
 - Faster build
 - Architecture validated through build system

Spring Boot 3.5.8 (~5.6 MiB)

```
> ll spring-boot* -s size
Permissions Size User      Group      Date Modified Name
-rw-r--r--@ 52k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-jarmode-tools-3.5.8.jar
-rw-r--r--@ 704k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-actuator-3.5.8.jar
-rw-r--r--@ 843k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-actuator-autoconfigure-3.5.8.jar
-rw-r--r--@ 1,9M mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-3.5.8.jar
-rw-r--r--@ 2,1M mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-autoconfigure-3.5.8.jar
```

Spring Boot 4.0.0 (~3.8 MiB)

```
> ll spring-boot* -s size
Permissions Size User      Group      Date Modified Name
-rw-r--r--@ 15k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-validation-4.0.0.jar
-rw-r--r--@ 16k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-persistence-4.0.0.jar
-rw-r--r--@ 16k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-data-jpa-4.0.0.jar
-rw-r--r--@ 21k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-transaction-4.0.0.jar
-rw-r--r--@ 24k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-jpa-4.0.0.jar
-rw-r--r--@ 29k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-micrometer-observation-4.0.0.jar
-rw-r--r--@ 29k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-hibernate-4.0.0.jar
-rw-r--r--@ 30k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-data-commons-4.0.0.jar
-rw-r--r--@ 31k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-thymeleaf-4.0.0.jar
-rw-r--r--@ 36k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-sql-4.0.0.jar
-rw-r--r--@ 47k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-http-converter-4.0.0.jar
-rw-r--r--@ 47k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-servlet-4.0.0.jar
-rw-r--r--@ 53k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-jarmode-tools-4.0.0.jar
-rw-r--r--@ 68k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-jackson-4.0.0.jar
-rw-r--r--@ 84k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-cache-4.0.0.jar
-rw-r--r--@ 122k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-tomcat-4.0.0.jar
-rw-r--r--@ 144k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-actuator-autoconfigure-4.0.0.jar
-rw-r--r--@ 154k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-health-4.0.0.jar
-rw-r--r--@ 168k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-webmvc-4.0.0.jar
-rw-r--r--@ 174k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-web-server-4.0.0.jar
-rw-r--r--@ 201k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-jdbc-4.0.0.jar
-rw-r--r--@ 242k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-micrometer-metrics-4.0.0.jar
-rw-r--r--@ 357k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-actuator-4.0.0.jar
-rw-r--r--@ 369k mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-autoconfigure-4.0.0.jar
-rw-r--r--@ 1,4M mhalbritter mhalbritter 2024-11-28 14:37 spring-boot-4.0.0.jar
```

New starters

- Every supported dependency has now its own starter (and a -test starter)
- E.g.
 - Flyway: `org.flywaydb:flyway-core` → `spring-boot-starter-flyway`
 - Liquibase: `org.liquibase:liquibase-core` → `spring-boot-starter-liquibase`
 - Kafka: `org.springframework.kafka:spring-kafka` → `spring-boot-starter-kafka`
 - Zipkin: `io.zipkin.reporter2:zipkin-reporter-brave` → `spring-boot-starter-zipkin`
 - LDAP: `com.unboundid:unboundid-ldapsdk` → `spring-boot-starter-ldap`
 - GSON: `spring-boot-starter-gson`
 - Hazelcast: `spring-boot-starter-hazelcast`
 - OpenTelemetry: `spring-boot-starter-opentelemetry`
 - And more, the full list [can be found in the upgrade guide](#)

Beware: RestTemplate / RestClient / WebClient

- `spring-boot-starter-webmvc` no longer pulls in auto-configuration for `RestTemplate`, `RestClient` or `WebClient`
- If you need a `RestTemplate` / `RestClient`, add:
 - `spring-boot-starter-restclient`
- `RestTemplate` is now deprecated for removal, use `RestClient` instead
- If you need a `WebClient`, add:
 - `spring-boot-starter-webclient`

Test starters

- Every starter has a matching -test starter
- E.g.
 - `spring-boot-starter-webmvc` has `spring-boot-starter-webmvc-test`
 - `spring-boot-starter-security` has `spring-boot-starter-security-test`
 - `spring-boot-starter-flyway` has `spring-boot-starter-flyway-test`
- These tests starters contain test support for the technology
 - E.g. the flyway test starter depends on `spring-boot-jdbc-test`, which ships `@AutoConfigureJdbc`, `@AutoConfigureTestDatabase` and `@JdbcTest`

Spring Boot 3.5.x

```
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-web</artifactId>
</dependency>
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-security</artifactId>
</dependency>
<dependency>
  <groupId>org.flywaydb</groupId>
  <artifactId>flyway-core</artifactId>
</dependency>
```

Spring Boot 4.0.x

```
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-webmvc</artifactId>
</dependency>
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-security</artifactId>
</dependency>
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-flyway</artifactId>
</dependency>
```

Spring Boot 4.0.x

```
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-webmvc-test</artifactId>
  <scope>test</scope>
</dependency>
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-security-test</artifactId>
  <scope>test</scope>
</dependency>
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-flyway-test</artifactId>
  <scope>test</scope>
</dependency>
```


Don't care?

- Use `spring-boot-starter-classic` and `spring-boot-starter-test-classic`
- Pulls in all (test-)auto-configure modules
- Drawback: Pulls stuff in which you may not need

Package renames

- With the new modules, some code has changed packages, e.g.:
 - `org.springframework.boot.autoconfigure.cache.JCacheManagerCustomizer` moved to `org.springframework.boot.cache.autoconfigure.JCacheManagerCustomizer`
 - `org.springframework.boot.test.web.server.LocalServerPort` moved to `org.springframework.boot.web.server.test.LocalServerPort`
 - `org.springframework.boot.web.client.RestTemplateBuilder` moved to `org.springframework.boot.restclient.RestTemplateBuilder`
 - `org.springframework.boot.actuate.health.AbstractHealthIndicator` moved to `org.springframework.boot.health.contributor.AbstractHealthIndicator`
 - `org.springframework.boot.actuate.health.Health` moved to `org.springframework.boot.health.contributor.Health`
- Pattern is: `org.springframework.boot.<module>`
- We haven't changed the name of the classes, only the package
- Not much of your code should be affected

Happy upgrading!

Thank you

mhalbritter.github.io

