

vmware® EXPLORE

SpringOne

Little Treasures

The Useful Spring Classes That You Might Not
Know

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#vmwareexplore #SPB1917LV



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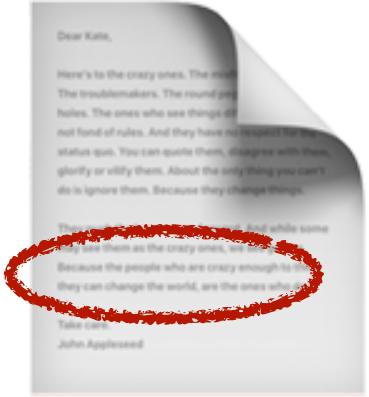




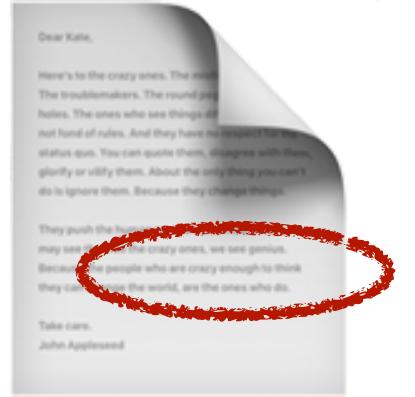
Define Treasure!



20 years ago...



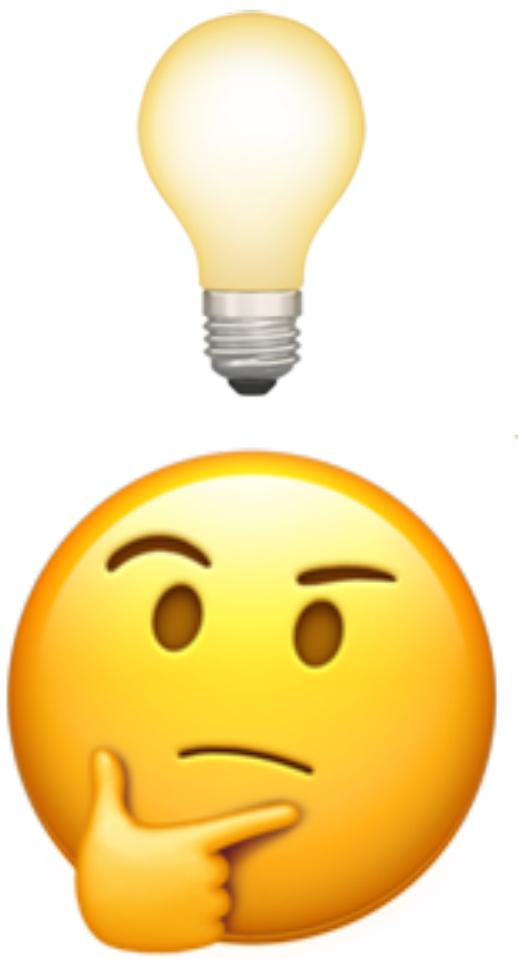
BeanFactory.java



FactoryBean.java



AbstractSingletonFactoryBean.java





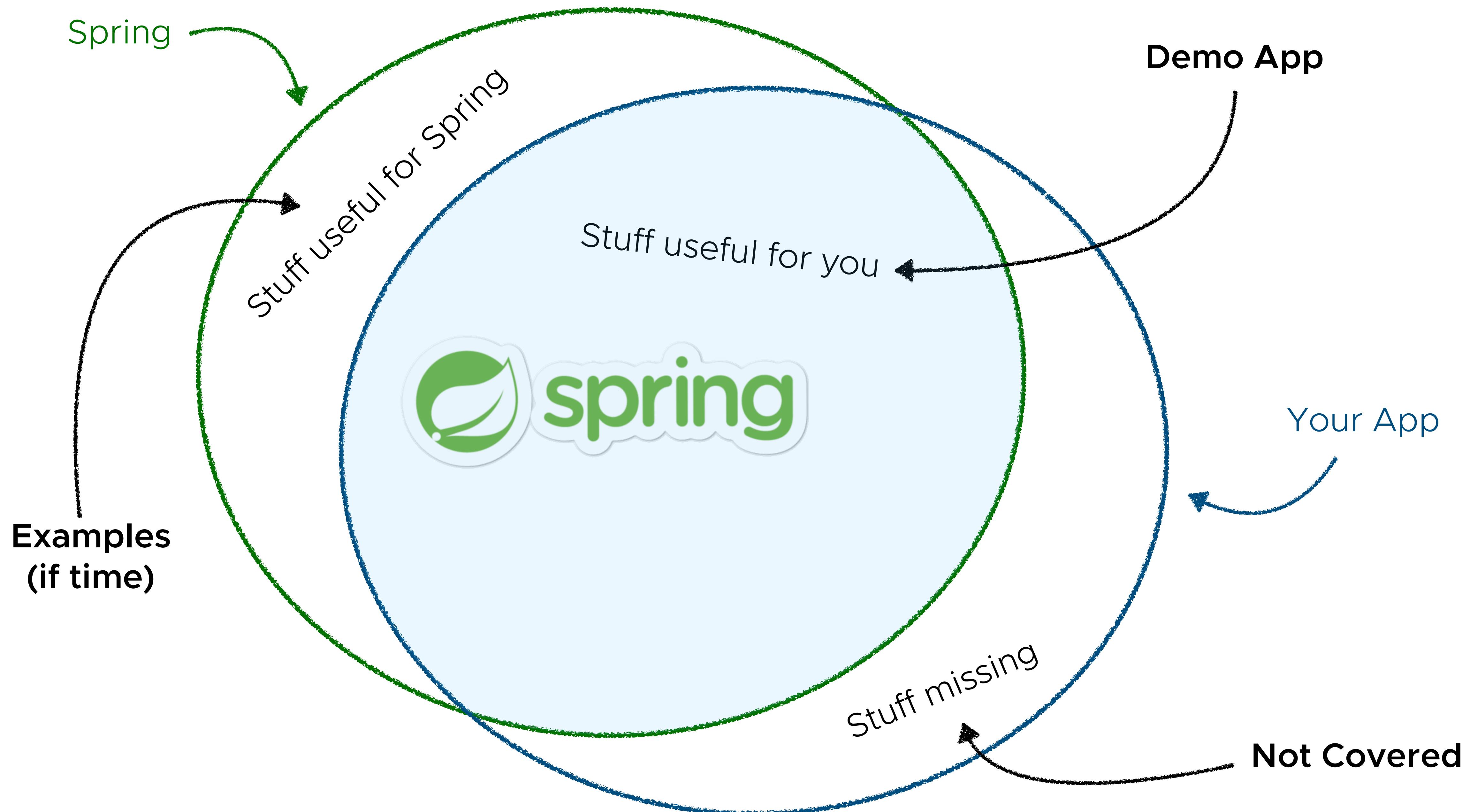
- Copy / Paste?
 - Use Apache Commons?
 - Extract Code?
-



Utils.java

20 years later...





Disclaimer!

- This demo app is daft!
- There are many ways to do things!
- You're free to choose alternatives
- Java is always evolving
- Remember:



About the Demo Application

- A simple REST application to show hotels on the Vegas Strip
 - All hotels, Hotel by name, Hotels by 'geographic order'
- YAML file with data taken from Wikipedia
- Support for JPEG thumbnail Images
- Written with Spring Boot 3.1

Requirement from IT

(totally made up)

- All production apps must respond with "AUTH: <code>" when started with `"-Dcom.example.production=true`"

[To the code...](#)

OutputCaptureExtension

Hidden Treasure #1

- JUnit5 Extension (use OutputCaptureRule for JUnit4)
- Inject CapturedOutput and
 - Use assertThat on it (it's a CharSequence)
 - Use getAll(), getOut() or getErr()
- Cleanup is handled automatically!

TestPropertyValues

Hidden Treasure #2

- Use `of` and `and` to build (Strings, Map, Iterable, Stream)
- Use `applyTo` to:
 - Apply to an `Environment`
 - Apply to a `ConfigurableApplicationContext`
- Use `applyToSystemProperties` to:
 - Apply and cleanup system properties
 - Can use `Runnable` or `Callable<T>` actions

YAML Data

(Because We Hate Ourselves)

- The project manager has provided the data we need as a YAML file!?!?
- We need to load this file and make it easy for the rest of the application to use

[To the code...](#)

Spring Boot's @ConfigurationProperties

Hidden Treasure #3

- Used extensively in Spring Boot but can be used directly!
- Binds to java beans or records
- Bind properties in the Environment
 - Most often from application.properties
 - Or from import:...

Creating the HotelService

- We'll create a HotelService that will provide easy to use logic for the REST controller to call
- We'll need
 - getAll()
 - findByName(...)
 - findByGeographicOrder(...)

[To the code...](#)

Assert

Hidden Treasure #4

- Probably the most used util class
- Mostly throws `IllegalArgumentExceptions`
 - `assertNotNull`
 - `assertHasText`
- Can throw `IllegalStateException`
 - `assertState`
- Has `Supplier` variants for performance

See [AssertExampleTests...](#)

Assert vs Objects

- `Assert.notNull(...)` vs `Objects.requireNonNull(...)`
 - `Assert` throws `IllegalArgumentException`
 - `Objects` throws `NullPointerException`
- Stylistic preference
 - NPE = Author of the code messed up
 - IAE = User of the code messed up

LinkedCaseInsensitiveMap

Hidden Treasure #5

- Case-insensitive Map
- Supports Locale
- Works with returned keySet and values

MultiValueMap

Hidden Treasure #6

- `Map<K,List<V>>`
- Easier to use than ``Map.computeIfAbsent``
- Basis for `HttpHeaders` but generally useful

CollectionUtils

Hidden Treasure #7

- unmodifiableMultiValueMap(...)
- isEmpty(...) (useful if collection might be null)
- Other useful method including support for Iterator and Enumeration types

Creating the HotelController

- We'll create a HotelController to provide JSON responses
 - /hotels - List all hotels
 - /hotels/{name} - Find by name
 - /search/geographicorder/{name} - All in geographic order

[To the code...](#)

MediaType

Hidden Treasure #8

- Useful list of common mime types
- Support compareTo etc

PropertyMapper

Hidden Treasure #9

- Used a lot in Spring Boot to map from ConfigurationProperties to third-party class
- Deals well with nulls
- General pattern is map ... from ... as ... to

StringUtils

Hidden Treasure #10

- Helpful String utils
 - capitalize(...) / uncapitalize(...)
 - startsWithIgnoreCase(...) / endsWithIgnoreCase(...)
 - countOccurrencesOf(...)
 - split(...)
 - collectionToDelimitedString(...)
 - etc...

UriUtils

Hidden Treasure #11

- URI encoding methods
- URI decoding methods

JacksonTester

Hidden Treasure #12

- Helper for testing JSON serialization/deserialization
- Can be used with `@JsonTest` or standalone
- Designed to work with AssertJ
- Provides read and write methods
- `GsonTester` and `SimpleJsonTester` also available

[See HotelSummaryJsonTests...](#)

Creating the HotelImagesController

- We'll create a ImageController to provide thumbnail images
 - All images will be 200 x 200 pixels
 - Resizing will happen on the fly
 - We should cache results to save on compute

[To the code...](#)

Spring's Resource Abstraction

Hidden Treasure #13

- Handy way to open Files, URLs, Classpath Resources
- Quick access to data
 - `getInputStream()`
 - `getContentAsByteArray()`
 - `getContentAsString(...)`
 - `readableChannel()`

LogMessage

Hidden Treasure #14

- Saves on `logger.isDebugEnabled()` calls
- Use `LogMessage.format` to format a message
 - (you might not need this if you're using SLF4J)
- Use `LogMessage.of` for expensive operations

Throwing Functional Interfaces

Hidden Treasure #15

- Available for Consumer, Supplier, Function, BiFunction
- Use in your own APIs
- Or to make existing APIs easier to use
- Throws RuntimeException by default but can be configured

See [ThrowingFunctionalInterfaceExampleTests](#)

FileCopyUtils

Hidden Treasure #16

- Copy from InputStream
 - to strings
 - to byte arrays
 - to other streams
- Closes the stream after
- See StreamUtils for non-closing version
- If using Java 9+ see InputStream readAllBytes and transferTo

ObjectUtils

Hidden Treasure #17

- General Object Utils:
 - isEmpty(...)
 - isArray(...)
 - nullSafeToString(...)
 - nullSafeHashCode(...)
- Predates java.util.Objects and some overlap

ConcurrentReferenceHashMap

Hidden Treasure #18

- ConcurrentHashMap with support for soft and weak references
- Better concurrency than Collections.synchronizedMap(new WeakHashMap<K, Reference<V>>())
- Used extensively within Spring for caching

Bonus Section

(if time)

Generics and Type Erasure

Bonus Hidden Treasure #1

- Java supports generics but uses type erasure for back compatibility reasons
- Spring can inject using generics
- Spring can use generic types with lambdas
- How?

See `ResolvableTypeExampleTests` and `LambdaSafeExampleTests...`

Spring Java Format

Bonus Hidden Treasure #2

- Opinionated Java Formatter
- Checkstyle Rules
- IDE Plugins (IntelliJ, Eclipse, VS Code)
- Used by several Spring Projects but can also be used by you!

Stay Connected

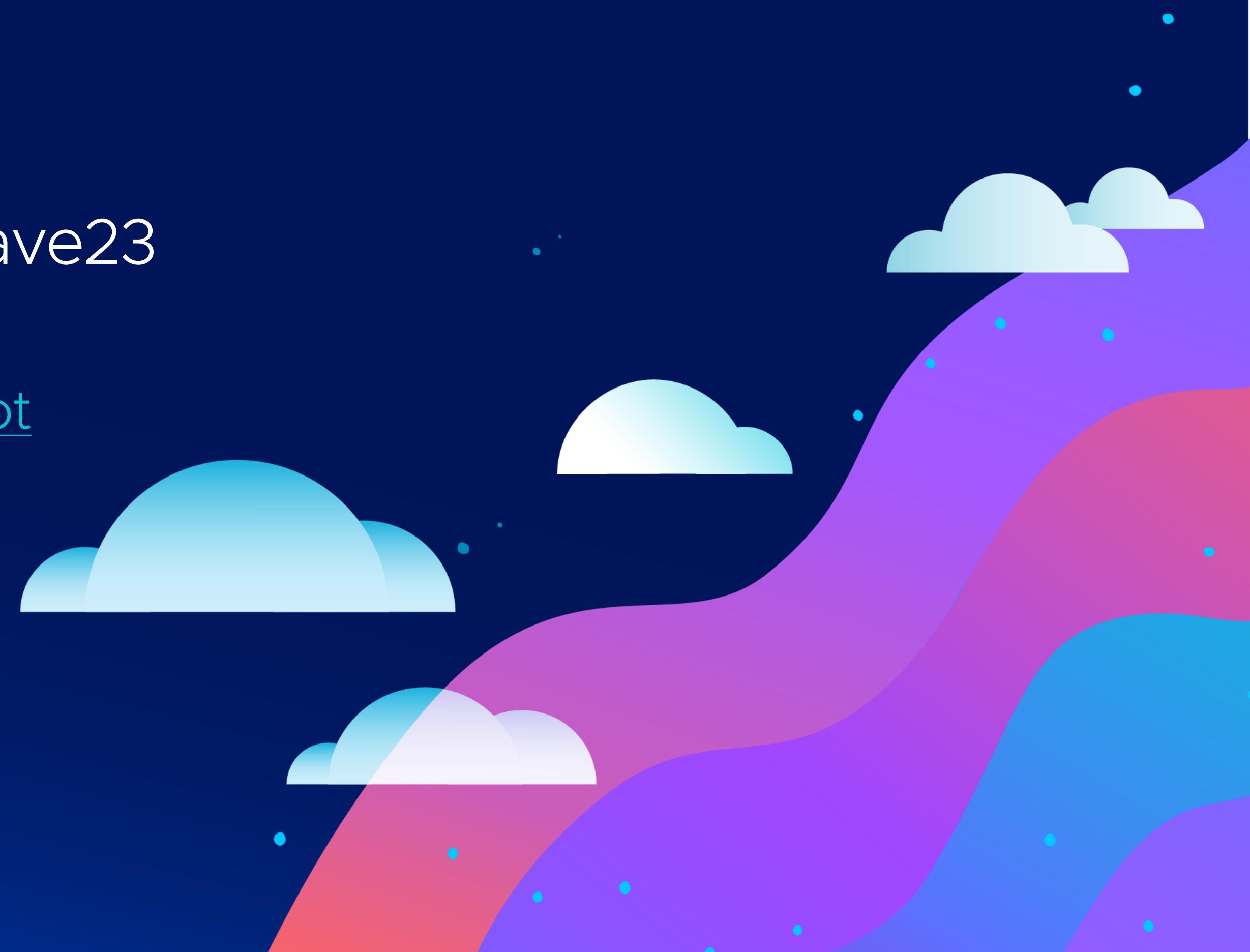
Let's continue the conversation

Follow us @phillip_webb @madhurabhave23

Visit us github.com/spring-projects/spring-boot

Dig deeper with <https://github.com/philwebb/little-treasures>

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Thank you

