Key Factory Method Operators in the Mono Class

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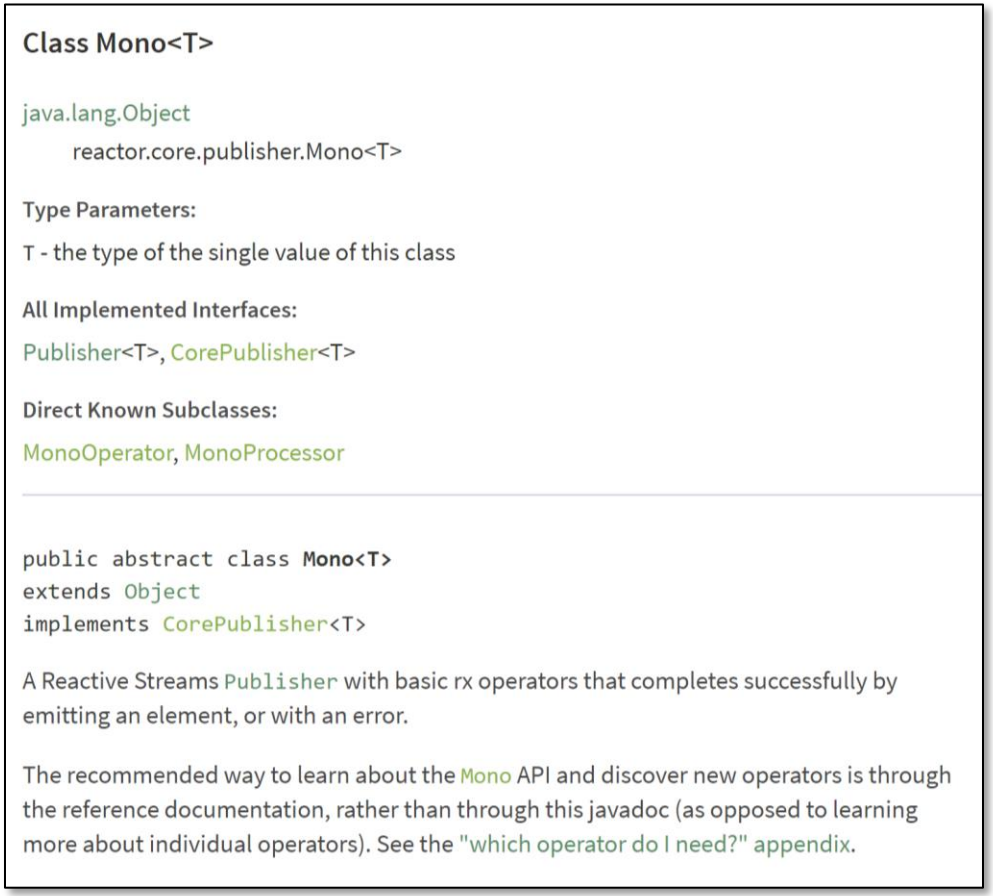
Learning Objectives in this Part of the Lesson

- Recognize key Mono operators



Class Mono<T>

java.lang.Object
    reactor.core.publisher.Mono<T>

Type Parameters:

T - the type of the single value of this class

All Implemented Interfaces:

Publisher<T>, CorePublisher<T>

Direct Known Subclasses:

MonoOperator, MonoProcessor

```
public abstract class Mono<T>
extends Object
implements CorePublisher<T>
```

A Reactive Streams `Publisher` with basic rx operators that completes successfully by emitting an element, or with an error.

The recommended way to learn about the `Mono` API and discover new operators is through the reference documentation, rather than through this javadoc (as opposed to learning more about individual operators). See the "which operator do I need?" appendix.

See projectreactor.io/docs/core/release/api/reactor/core/publisher/Mono.html

Learning Objectives in this Part of the Lesson

- Recognize key Mono operators
  - Factory method operators
    - These operators create Mono objects in various ways
      - e.g., just() & fromCallable()

See en.wikipedia.org/wiki/Factory_method_pattern

Key Factory Method Operators in the Mono Class

Key Factory Method Operators in the Mono Class

- The just() method
  - Create a new Mono that emits the specified item

```
static <T> Mono<T> just(T data)
```

See projectreactor.io/docs/core/release/api/reactor/core/publisher/Mono.html#just

Key Factory Method Operators in the Mono Class

- The just() method
  - Create a new Mono that emits the specified item
    - The param is the one & only item emitted to onNext()

```
static <T> Mono<T> just(T data)
```

Key Factory Method Operators in the Mono Class

- The just() method

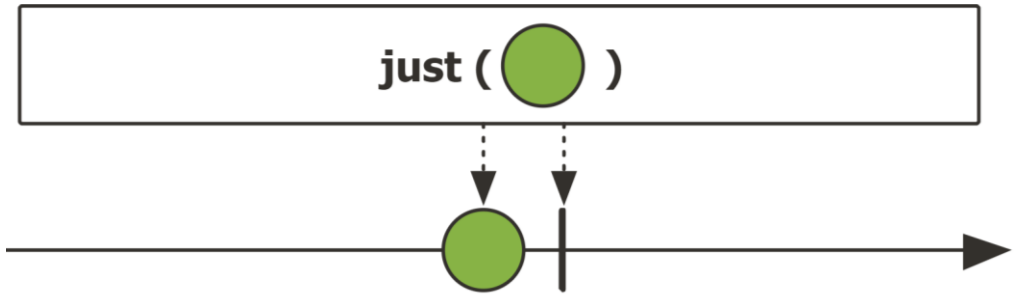
```
static <T> Mono<T> just(T data)
```

  - Create a new Mono that emits the specified item
    - The param is the one & only item emitted to onNext()
    - Returns the Mono that's captured at instantiation time
      - i.e., just() is "eager" & it therefore always runs in the thread where the "assembly" is performed

Keep these semantics in mind when we talk about the subscribeOn() operator..

Key Factory Method Operators in the Mono Class

- The just() method
  - Create a new Mono that emits the specified item
  - This factory method adapts non-reactive input sources into the reactive model




```
Mono
    .just(BigFraction
            .reduce(unreducedFraction))
    ...
```

Create a Mono that reduces a big fraction

See Reactive/mono/ex1/src/main/java/MonoEx.java

Key Factory Method Operators in the Mono Class

- The just() method
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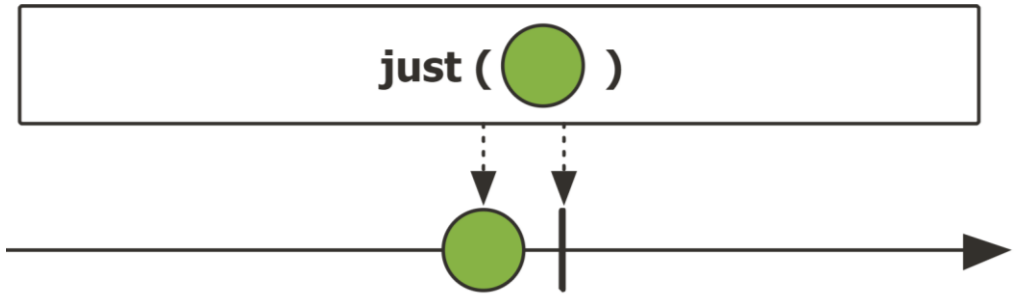
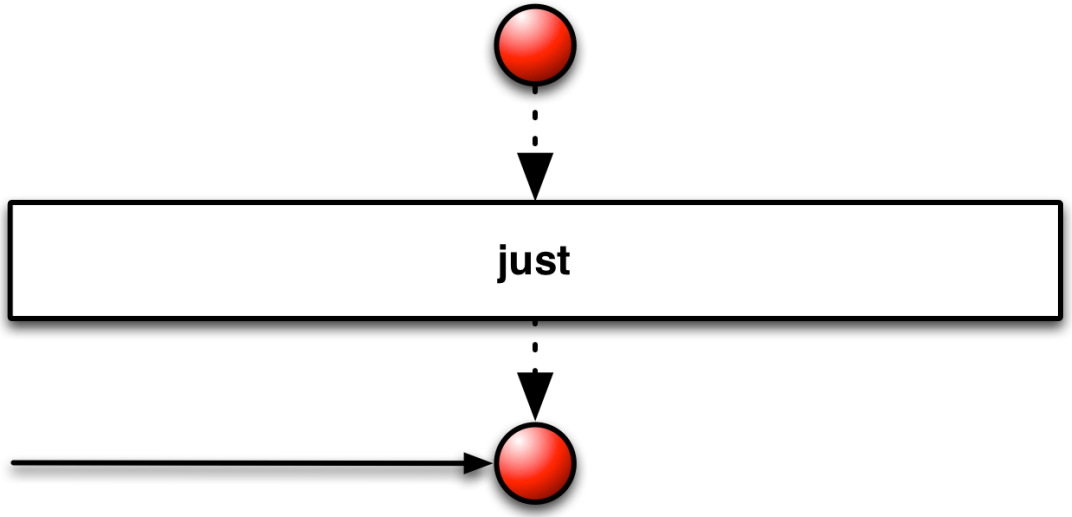


```
Mono
   .just(BigFraction
         .reduce(unreducedFraction))
   ...
```

This value is captured "eagerly" at instantiation time & is the value returned for all subscribers

Key Factory Method Operators in the Mono Class

- The just() method
  - Create a new Mono that emits the specified item
  - This factory method adapts non-reactive input sources into the reactive model
  - RxJava's Single.just() works the same way



Create a Single that reduces a big fraction

```
Single
    .just(BigFraction
            .reduce(unreducedFraction))
    ...
```

See reactivex.io/RxJava/3.x/javadoc/io/reactivex/rxjava3/core/Single.html#just

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
  - This factory method creates a Mono of type T

```
static <T> Mono<T> fromCallable
  (Callable<? extends T> supplier)
```

See projectreactor.io/docs/core/release/api/reactor/core/publisher/Mono.html#fromCallable

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
  - This factory method creates a Mono of type T
    - The Mono's value is produced via the provided Callable supplier

```
static <T> Mono<T> fromCallable
  (Callable<? extends T> supplier)
```

Interface Callable<V>

Type Parameters:

V - the result type of method call

All Known Subinterfaces:

DocumentationTool.DocumentationTask, JavaCompiler.CompilationTask

Functional Interface:

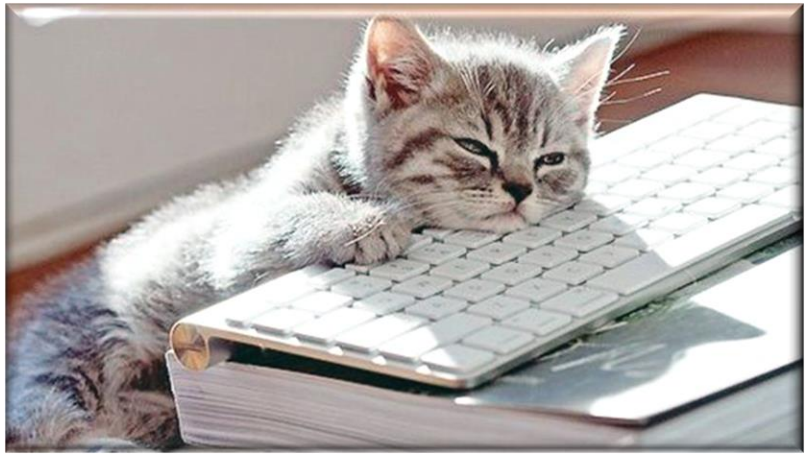
This is a functional interface and can therefore be used as the assignment target for a lambda expression or method reference.

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Callable.html

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
  - This factory method creates a Mono of type T
    - The Mono's value is produced via the provided Callable supplier
    - Returns the Mono emitted by the supplier at runtime
      - i.e., it's "lazy"

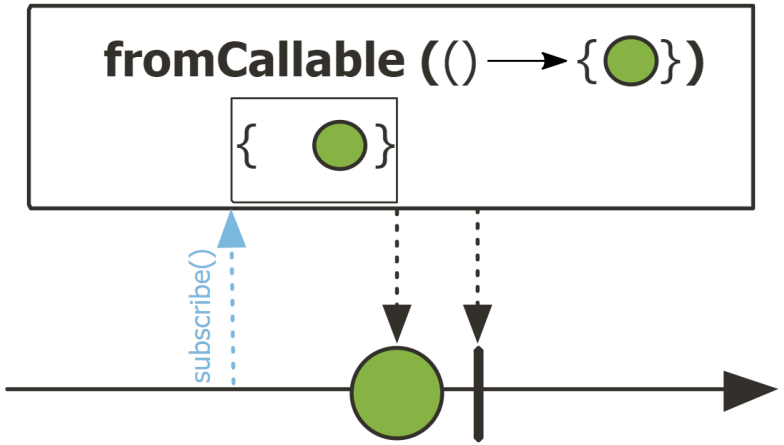
```
static <T> Mono<T> fromCallable
  (Callable<? extends T> supplier)
```



Again, keep these semantics in mind when we talk about subscribeOn() later..

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
  - This factory method creates a Mono of type T
  - This factory method adapts non-reactive input sources into the reactive model



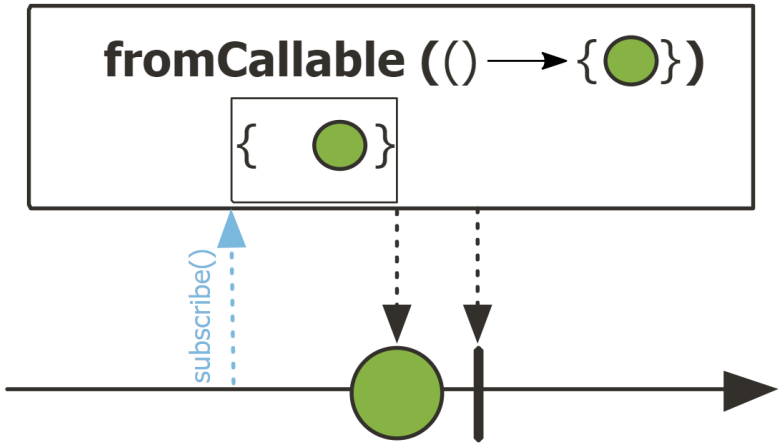
Create a Mono that reduces a big fraction

```
Mono
   .fromCallable
      (() ->
       BigFraction
          .reduce
             (unreducedFraction))
...
```

See Reactive/mono/ex1/src/main/java/MonoEx.java

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
  - This factory method creates a Mono of type T
  - This factory method adapts non-reactive input sources into the reactive model
    - Unlike just(), fromCallable() is "lazy"




```
Mono
   .fromCallable
     (() ->
      BigFraction
         .reduce
            (unreducedFraction))
...
```

It invokes the callable param at the time of subscription & separately for each subscriber

See earlier discussion of the Mono.just() operator

Key Factory Method Operators in the Mono Class

- The fromCallable() operator
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  - This factory method adapts non-reactive input sources into the reactive model
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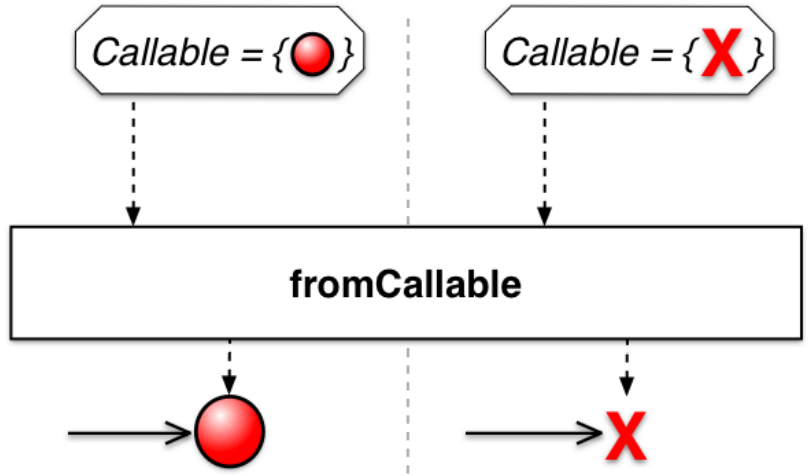


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   .fromCallable
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It invokes the callable param at the time of subscription & separately for each subscriber

See reactivex.io/RxJava/3.x/javadoc/io/reactivex/rxjava3/core/Single.html#fromCallable

End of Key Factory Method Operators in the Mono Class