Injecting Beans

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JAVA CHAMPION

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Previous Module

- Added constraints
- Book entity attributes
- BookRepository method parameters
- Bean Validation
- Deal with incorrect data
- Improved our integration tests

Overview

- Bean
- Dependency
- Context and Dependency Injection (CDI)
- Annotation to get an object reference
- Rely on external component
- Loose coupling

What Is a Bean?

Object that is managed by Java EE container

In Java EE most objects are beans

Except for JPA Entities

Extra services given by the container to a bean

What Is a Bean?

```
@Transactional(SUPPORTS)
public class BookRepository {

  // Default constructor

  public Long countAll() { ... }

  @Transactional(REQUIRED)
  public void delete(Long id) { ... }

}
```

What Is Injection?

Service given by the container

Applications are made of interactions

Beans depend on other beans

Beans don’t create their own dependencies

Inversion of control

What Is CDI?

Context and Dependency Injection

Loose coupling, strong typing

Container injects bean's references into other beans

Interceptors, decorators, events...

Injecting Beans into BookRepository

```
public class BookRepository {

  @Inject
  private NumberGenerator generator;

  @Inject
  private TextUtil textUtil;

  @Transactional(REQUIRED)
  public Book create(@NotNull Book book) {
    book.setIsbn(generator.generateNumber());
    book.setTitle(textUtil.sanitize(book.getTitle()));
    em.persist(book);
    return book;
  }
}
```

Depending on One Implementation

```
public class TextUtil {

  public String sanitize(String textToSanitize) {
    return textToSanitize.replaceAll("\\s+", " ");
  }
}
```

Depending on One Interface

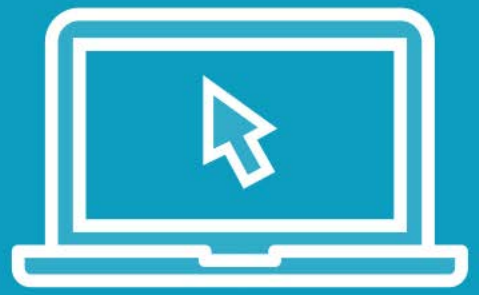
```
public interface NumberGenerator {

  String generateNumber();
}


public class IsbnGenerator implements NumberGenerator {

  @Override
  public String generateNumber() {
    return "13-84356-" + Math.abs(new Random().nextInt());
  }
}
```

Deployment Descriptor

beans.xml

```
<beans xmlns:xsi="..."
       bean-discovery-mode="all">
</beans>
```

Demo



BookRepository

Injecting beans

- TextUtil
- NumberGenerator

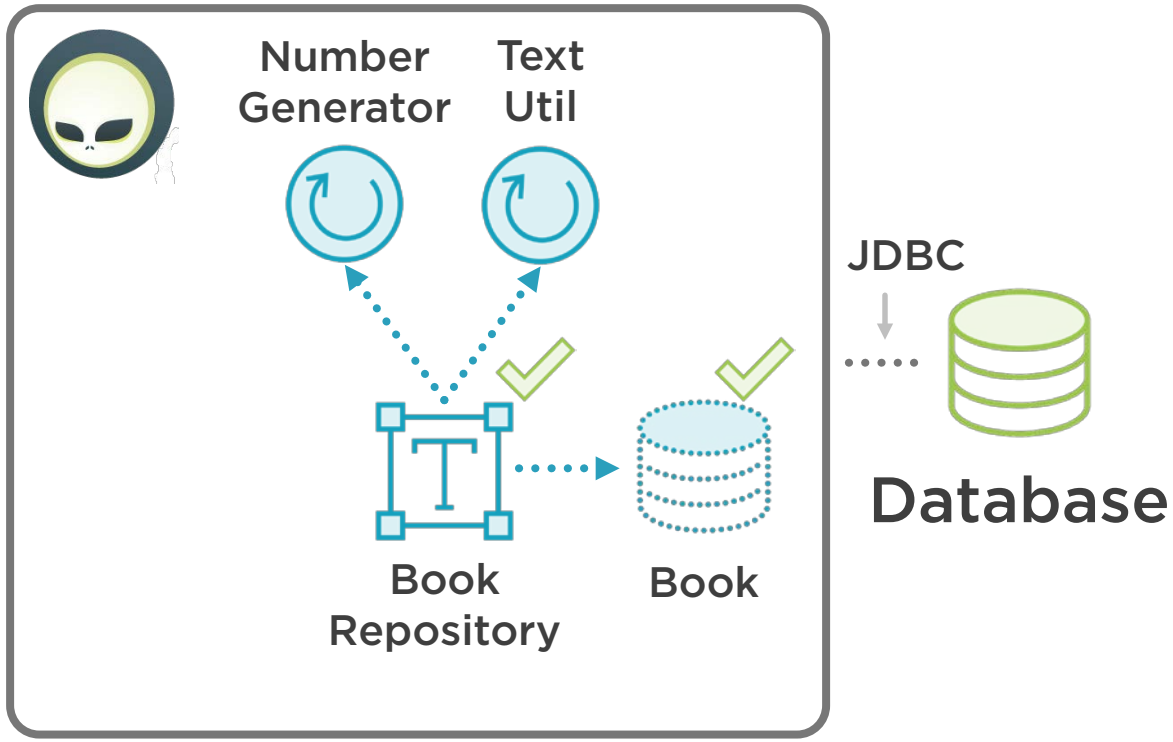
@Inject annotation

Deployment descriptor

Improve our tests

Anatomy of the BookStore Application

Angular



Java EE

Summary

A bean is any managed Java EE class

Benefit from services given by the container

Dependency injection

@Inject annotation

Deployment descriptor

Change our tests

Next Module

Expose a REST interface

Access business logic through HTTP

JAX-RS

Consume a REST endpoint

Hides technical details of HTTP protocol