Injecting Dependencies in an Object Using an Object Metamodel

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Agenda

2nd application: dependency injection

How to invoke methods by reflection

Defining Dependency Injection

There are 5 fundamental principles in Object Oriented Programming:

The SOLID principles

The D stands for Dependency Inversion

A way to implement it is to work with dependency injection

Injecting a Database Connection

We created an EntityManager

That creates the DB connection it needs

It creates a dependency between:

- the EntityManager
- and the H2 database we chose!

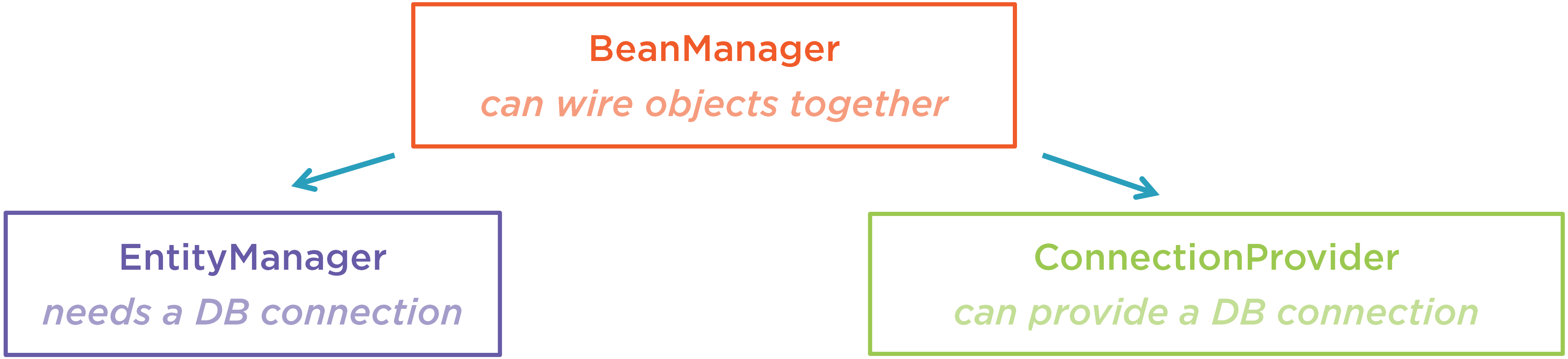
```
public class EntityManager {
   @Inject
   private Connection connection;
}
```

```
public H2ConnectionProvider {
   @Provides
   public static Connection createConnection(...) { ... }
}
```

Let us inject this dependency

And put the code that creates the connection somewhere else

Understanding Injection at Runtime



BeanManager

can wire objects together

EntityManager

needs a DB connection

ConnectionProvider

can provide a DB connection

```
BeanManager beanManager = BeanManager.getInstance();
EntityManager em = beanManager.get(EntityManager.class);
```

The BeanManager needs to create the connection object

So it needs to invoke a method using the Reflection API

And set it to the EntityManager

Invoking a Method Using the Reflection API

```java
public class ConnectionProvider {
   Connection createConnection(String uri) { ... }
}

Class<?> clss = ConnectionProvider.class;
Object connectionProvider = clss.getConstructor().getInstance();
Method method = clss.getMethod("createConnection", String.class);

method.invoke(connectionProvider, "jdbc:h2:mem:db_reflection");
```

Call the Method.invoke() to invoke a method

Or null if it is a static method

Demo

Let us see some code!

Let us create a bean manager

And see it in action

Module Wrap Up

What did you learn?

Another application of the Reflection API

How to create objects

How to inject dependencies in them

At the basis of Spring, CDI, Guice, …