Spring Dependency Injection & Java 5

Alef Arendsen

Introductions

- Alef Arendsen
  - Spring committer since 2003
  - Now Principal at SpringSource (NL)

Imagine

- A big pile of car parts
- Workers running around uncontrollably
- The parts don’t connect at all
- Creating cars was all done by hand

- That’s what car manufacturing was like before Ford introduced the assembly line!

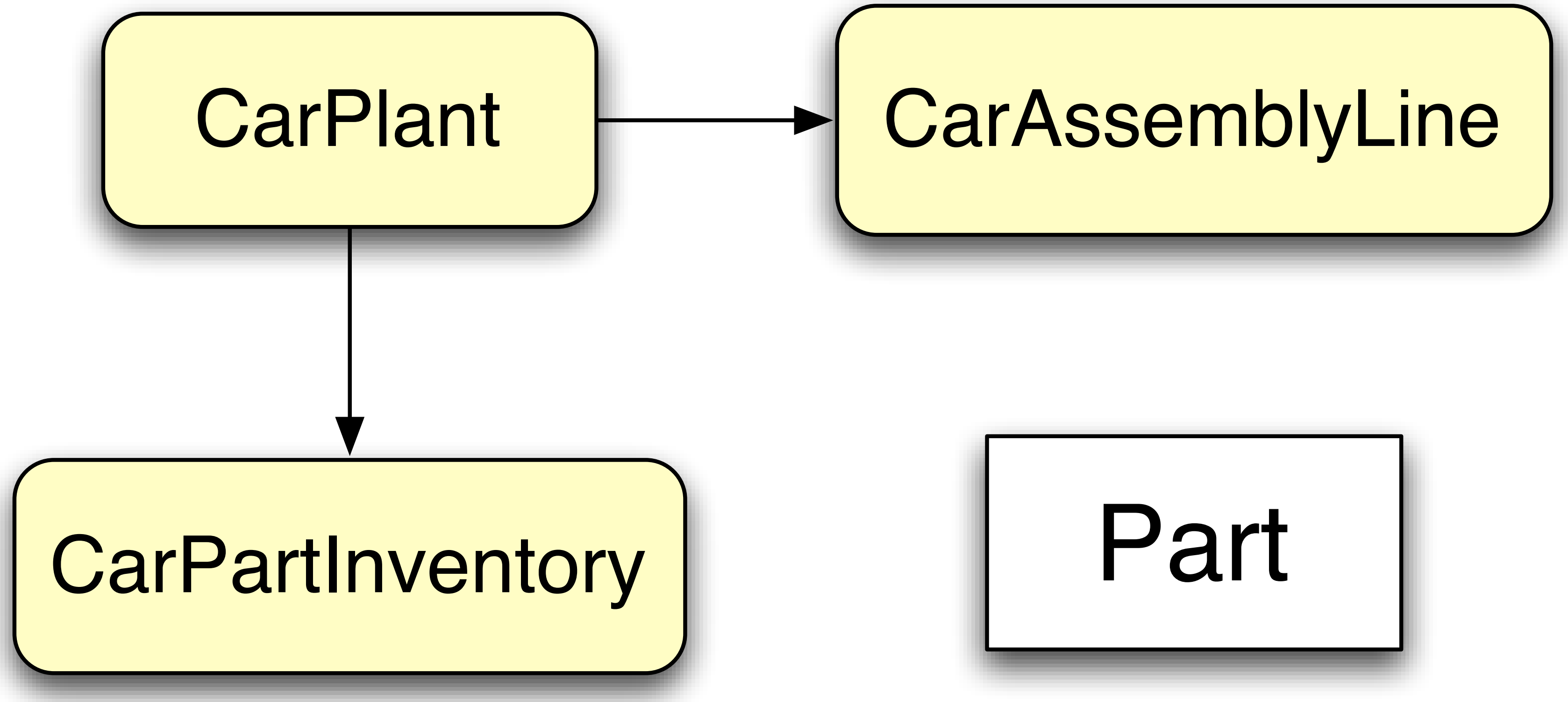
Imagine

The Model T was the first automobile mass produced on assembly lines with completely interchangeable parts...

By 1914, the assembly process for the Model T had been so streamlined it took only 93 minutes to assemble a car.

Source: Wikipedia

Part I
<bean>


CarPlant
CarAssemblyLine
CarPartInventory
Part

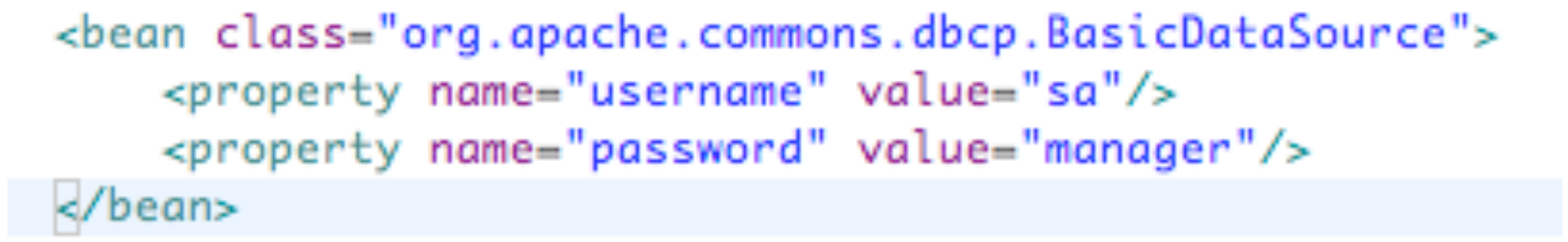
Spring Sucks!

- Spring == XML
- XML == Evil
- Evil == Sucks

- Therefore, Spring == Sucks

Benefits of XML configuration

- Easy for tooling to generate graphs
- Central location for all config data
- Configuration separate from Java code only option for code you don't control
- Easy solution for ambiguity



```xml
<bean class="org.apache.commons.dbcp.BasicDataSource">
    <property name="username" value="sa"/>
    <property name="password" value="manager"/>
</bean>
```

Drawbacks of XML configuration

- Perceived XML hell (partially true)
- Lack of type safety (at compile time)
  - Tooling helps us a bit here
- Less refactoring friendly
- Names needed to solve ambiguity

Part II
@Autowired and <bean>

@Component

- Candidate for auto-detection

```
@Component
public class HibernateCarPartsInventory
  implements CarPartsInventory {

     private SessionFactory sessionFactory;
...
}

<context:component-scan base-package="com.carplant"/>
```

@Autowired

- Constructor
- Field
- Property

```
@Autowired
public HibernateCarPartsInventory(
                 SessionFactory factory) {
     this.sessionFactory = factory;
}
```

Benefits of @Autowired approach

- 'Config' code in the Java code
- More type safe experience
- Elegant annotation-based solution for solving ambiguity (requires XML)

```
<bean class="com.carplant.inventory.HibernateCarPartsInventory">
    <qualifier type="com.carplant.util.Offline"/>
</bean>

<bean class="com.carplant.inventory.HibernateCarPartsInventory">
    <qualifier type="com.carplant.util.Online"/>
</bean>
```

```
@Autowired @Offline CarPartsInventory offlineInventory;
@Autowired @Online CarPartsInventory onlineInventory;
```

Drawbacks of @Autowired

- ‘Config’ code in the Java code
- Extra (sometimes complex) measures needed for solving ambiguity

```
<bean class="com.carplant.inventory.HibernateCarPartsInventory">
    <qualifier type="com.carplant.util.Offline"/>
</bean>

<bean class="com.carplant.inventory.HibernateCarPartsInventory">
    <qualifier type="com.carplant.util.Online"/>
</bean>
```

```
@Autowired @Offline CarPartsInventory offlineInventory;
@Autowired @Online CarPartsInventory onlineInventory;
```

Part III

@Bean and <bean>

@Configuration

- On type-level
- Identifies a class as a configuration class
- @Bean methods represent beans

```
@Configuration
public class MyConfig {

  public @Bean Service service() {
    return new Service();
  }
}
```

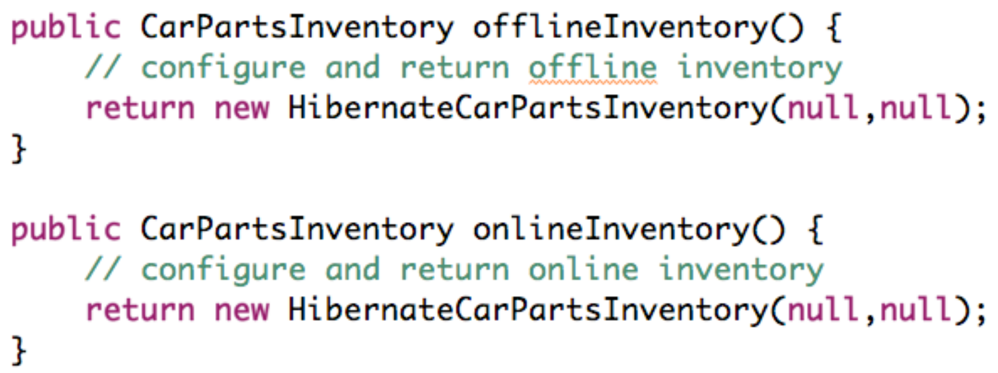
@ExternalBean

- Method-level
- Identifies a method returning an external bean

```
public abstract @ExternalBean DataSource dataSource();
```

Benefits of @Bean

- ‘Config’ code completely separate from Java code
- Entirely type safe approach
- Easy solution for ambiguity problem
- Allows for context inheritance
- Allows for 100% of all Java constructs



```
public CarPartsInventory offlineInventory() {
    // configure and return offline inventory
    return new HibernateCarPartsInventory(null,null);
}

public CarPartsInventory onlineInventory() {
    // configure and return online inventory
    return new HibernateCarPartsInventory(null,null);
}
```

Drawbacks of @Bean

- Harder to make it work in tooling
- It’s ‘configuration with a twist’
- Requires a little bit more code

Conclusion

Conclusion

- There's something for everyone in Spring
- Type safe and separate configuration
  - JavaConfig (@Bean)
- Type safe and config in Java code
  - @Autowired / @Component
- For external code and XML fans
  - <bean/>
- For specification-minded people
  - EJB 3

Conclusion

- All three approaches build on Spring’s proven and solid foundation
  - Just mix and match all approaches
  - A moving model, not a fixed static snapshot of the current state of DI
- Plus all the other benefits
  - Easy JMX exporting
  - Ease AOP configuration