JUDCon

JBoss Users & Developers Conference

2012:India

Bridging The Gap

Integrating Spring and CDI

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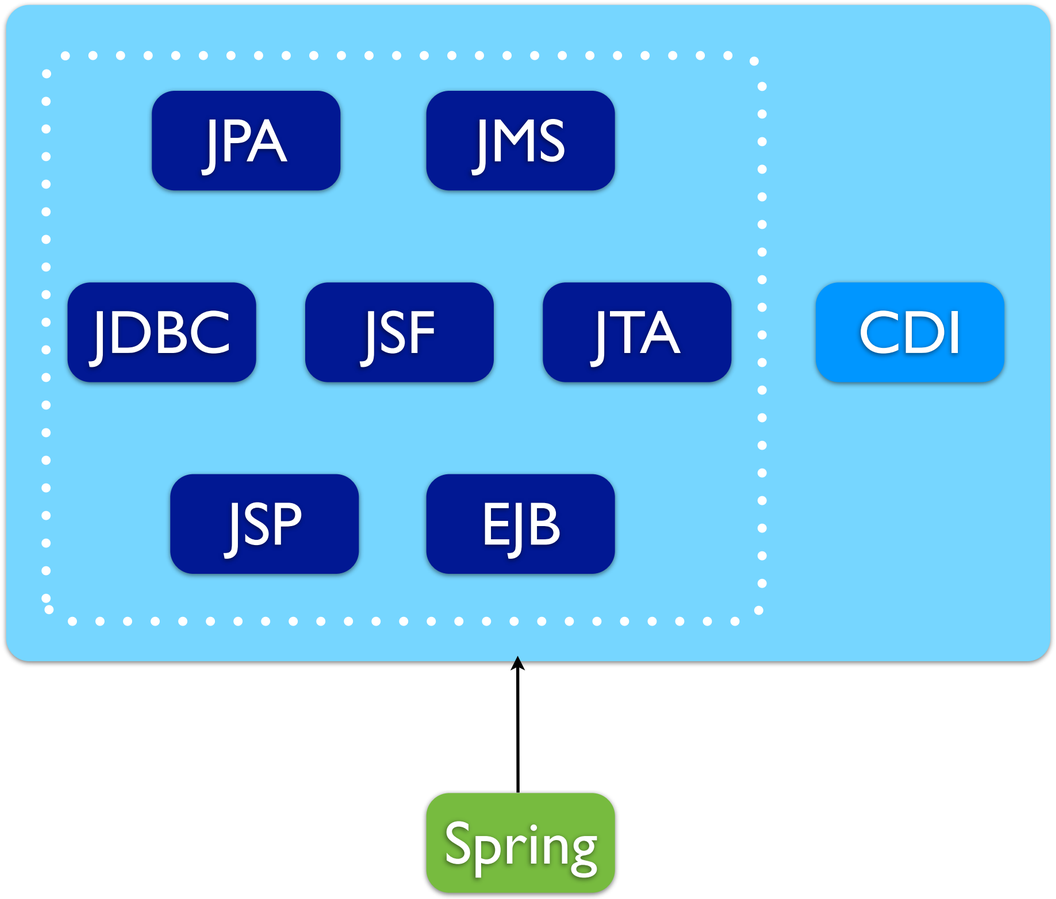
Protagonists

Spring	Contexts & Dependency Injection
Since 2004	Since 2009
Popular Enterprise Java Framework	Standard Programming Model for Java EE 6
Conceived to provide an alternative to EJBs	Integrates with EJB
Dependency Injection	Dependency Injection
AOP	Cross Cutting Concerns

Commonalities

- Similar Concepts
  - **container** – managing object graphs according to a developer-provided blueprint
    - **bean** – a managed object
- Both Support
  - JSR-330 (@Inject)
  - JSR-250 (Java EE 5 injection, Lifecycle Annotations)

Differences

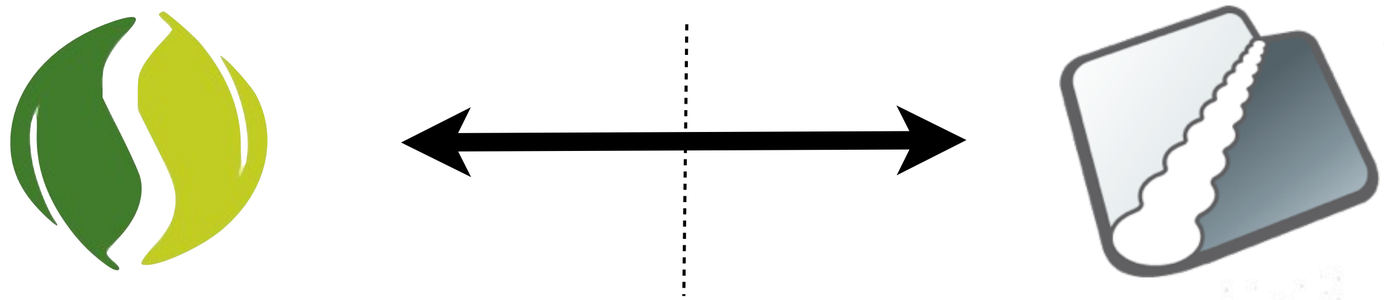


- Implicit (CDI) vs. explicit (Spring) blueprint

Seam-Spring Module

A utility library for integrating
Spring and CDI programming models

Enables the use of
Java business components
across technology lines



Seam 3 Spring Module

- Seam3 - a library of CDI extensions
- Similar functionality to the Seam 2 Spring integration
  - With CDI specific undertones
- Will merge into **Apache DeltaSpike**

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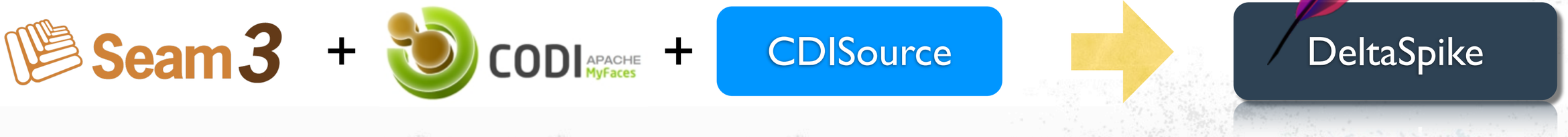

Seam 3 Modules

- Solder
- Config
- Social
- JMS
- JCR
- Security
- I18N
- Mail
- Validation
- Wicket
- Catch
- Remoting
- REST
- Faces
- **Spring**

Drools
SwitchYard
jBPM
Errai
TBD
Ecetera

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Apache incubator

DeltaSpike

Various JBoss Projects

- Drools
- SwitchYard
- jBPM
- Errai
- TBD
- Ecetera

Seam3 Spring Module Design Goals

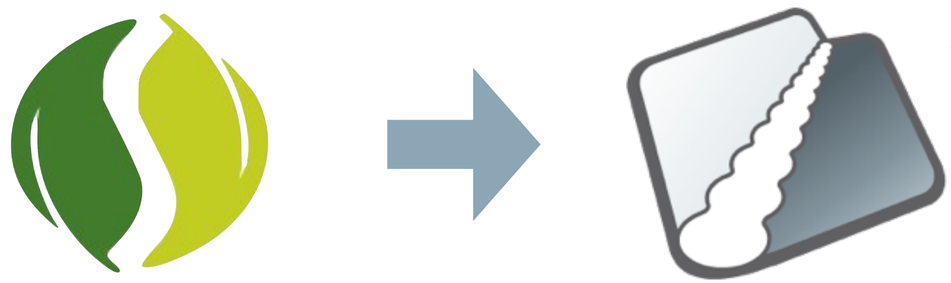
- **Minimize** changes to existing code
- **Non-intrusive** approach
- Highly **customizable**
- Mirror **similar** capabilities

Why?

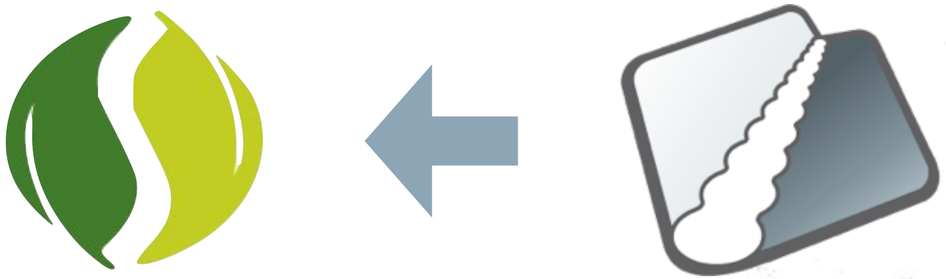
- **Reuse** existing investments
- **Integrate groups** with various expertise
- **Simplify** integration of Spring and Java EE
- **Ease migration** of legacy Spring apps to Java EE 6

Seam 3 Spring Module Features

- Integrating Spring components into CDI
  - Accessing Spring `ApplicationContexts`
    - created by the extension
    - access AC's created by Spring components (e.g. web ApplicationContext)
- Accessing CDI beans
  - exposing Spring beans as CDI beans



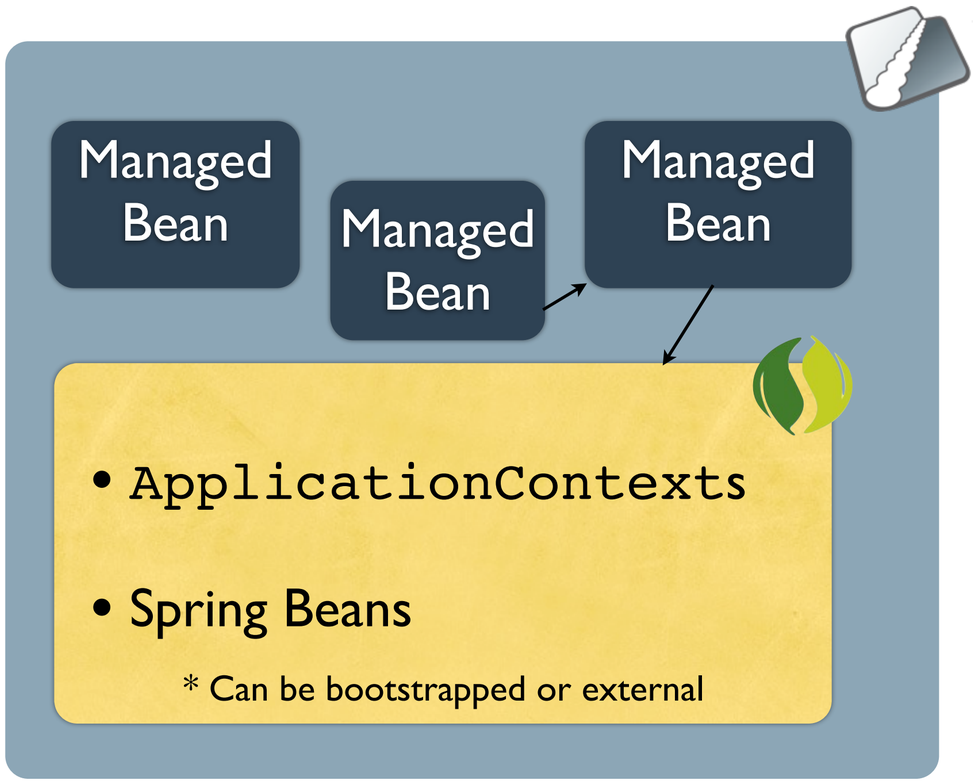
-or-

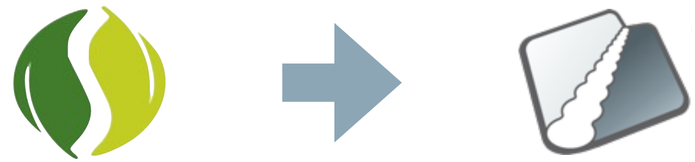


Integrating Spring into CDI

1.) Get the ApplicationContext

Integrating Spring components into CDI





- Implemented as a Standard CDI Extension
- Spring contexts and Spring beans are installed as CDI beans
- Implemented using the resource producer pattern

`ApplicationContext` Management

Spring contexts are exposed as CDI beans

```
@Produces @Web @SpringContext
   ApplicationContext context;
```

Created by Seam Spring Module

- @Producer fields
- SPI Based

- or -

Created by Spring

e.g. a Web `ApplicationContext`

`@SpringContext` Annotation

1.) Bootstrapped By Spring- CDI Extension

```
@Produces @SpringContext
@ApplicationScoped
@Configuration
(locations={"classpath:springCtx.xml"})
ApplicationContext springContext;
```

`@SpringContext` Annotation

2.) Used within a CDI Managed Bean

```
//Usage
@Inject @SpringContext
ApplicationContext context;
```

`@SpringContext` Annotation

1.) Web Application Context (external)

```
// Spring Application Context loaded by
// Servlet container

@Produces @Web @SpringContext
   ApplicationContext context;
```

Integrating Spring into CDI

2.) Get access to the Spring Beans

`@SpringContext` Annotation

2.) Use within a CDI Managed Bean

```
//Usage
@Inject @SpringContext
ApplicationContext context;
```

Spring Bean Producer

Apply the *resource producer pattern* for creating Spring `ApplicationContext` CDI beans

```
@Produces @SpringBean
  UserService userService;
```

```
//Usage
@SessionScoped
public class AllocationManager {
  @Inject
  UserService userService;
}
```

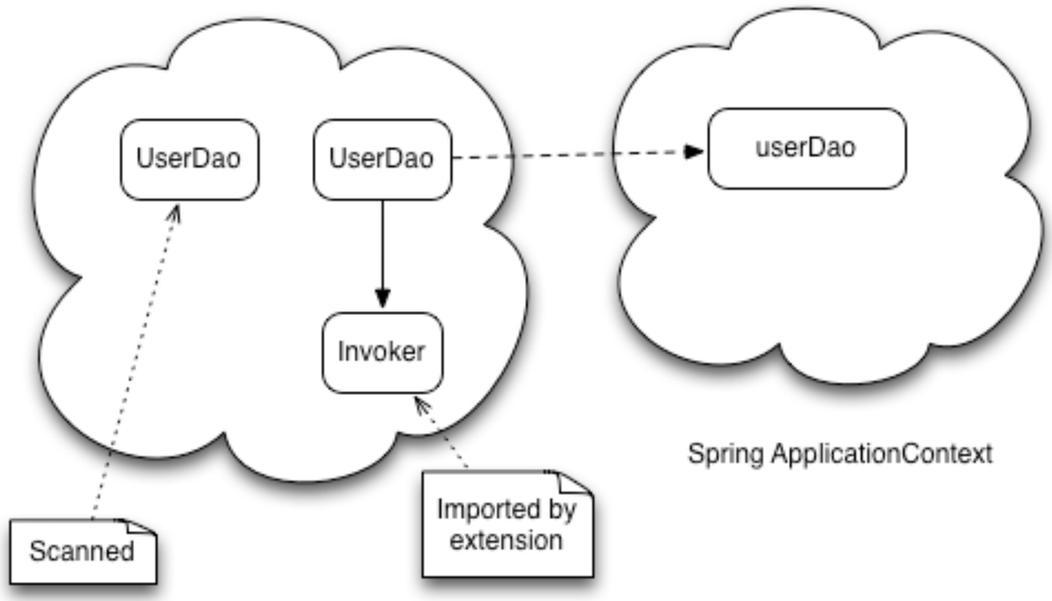
Avoiding Bean Duplication

- Imported Spring beans may cause duplication issues
  - CDI will add any classes automatically as beans
  - Extension-added beans will be in conflict

- Options:
  - Solder **@Veto** annotation (recommended)
  - Using side-effects of **@Typed** and **@Alternative** (standard-based but we do not recommend)

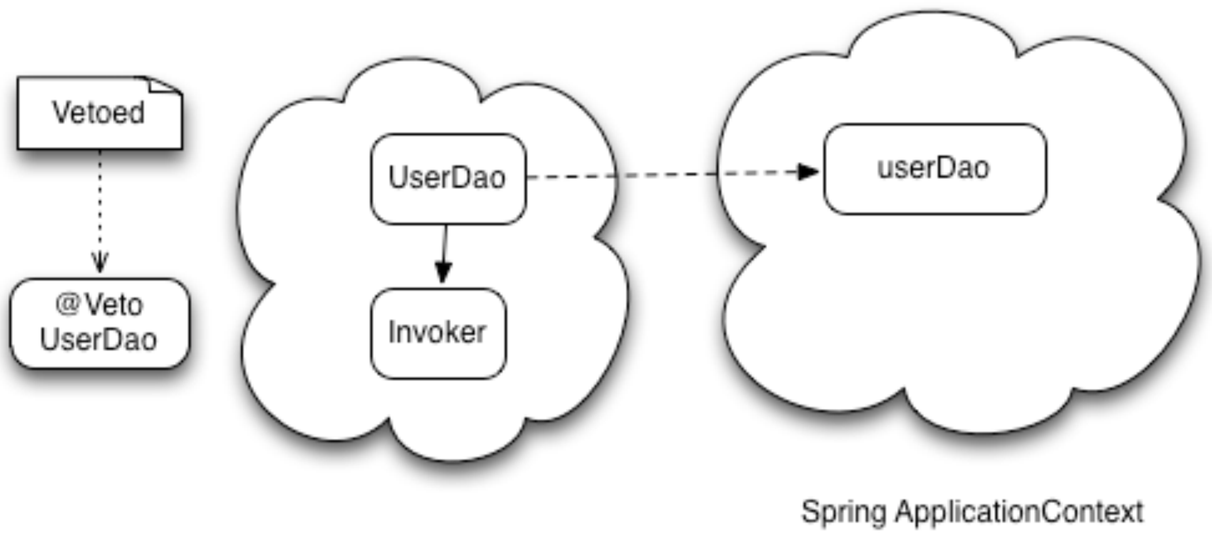
- Proprietary extensions for bean scanning (e.g. Weld)

Bean Duplication and Vetoing



Importing beans may result in duplication ...

... but vetoing can solve this problem



In-Extension Context Bootstrapping

- Alternative to @Produces @SpringContext @Configuration
- Advantages relative to CDI lifecycle
  - Spring context is bootstrapped before bean discovery
  - Spring bean classes are automatically vetoed

Integrating CDI into Spring

CDI integration into Spring

- Uses standard Spring mechanisms
  - BeanFactories
  - BeanPostProcessors/BeanFactoryPostProcessors
- Most facilities are hidden behind the <cdi:*/> namespace

Accessing the Bean Manager

```
<cdi:bean-manager/>
```

- Usage:
  @Autowired BeanManager beanManager;

```
xmlns:cdi="http://www.jboss.org/schema/seam/spring"
```

Accessing CDI Beans

```
<cdi:bean-reference id="user" type="example.User">
      <cdi:qualifier type="example.BusinessUser"/>
</cdi:bean-reference>
```

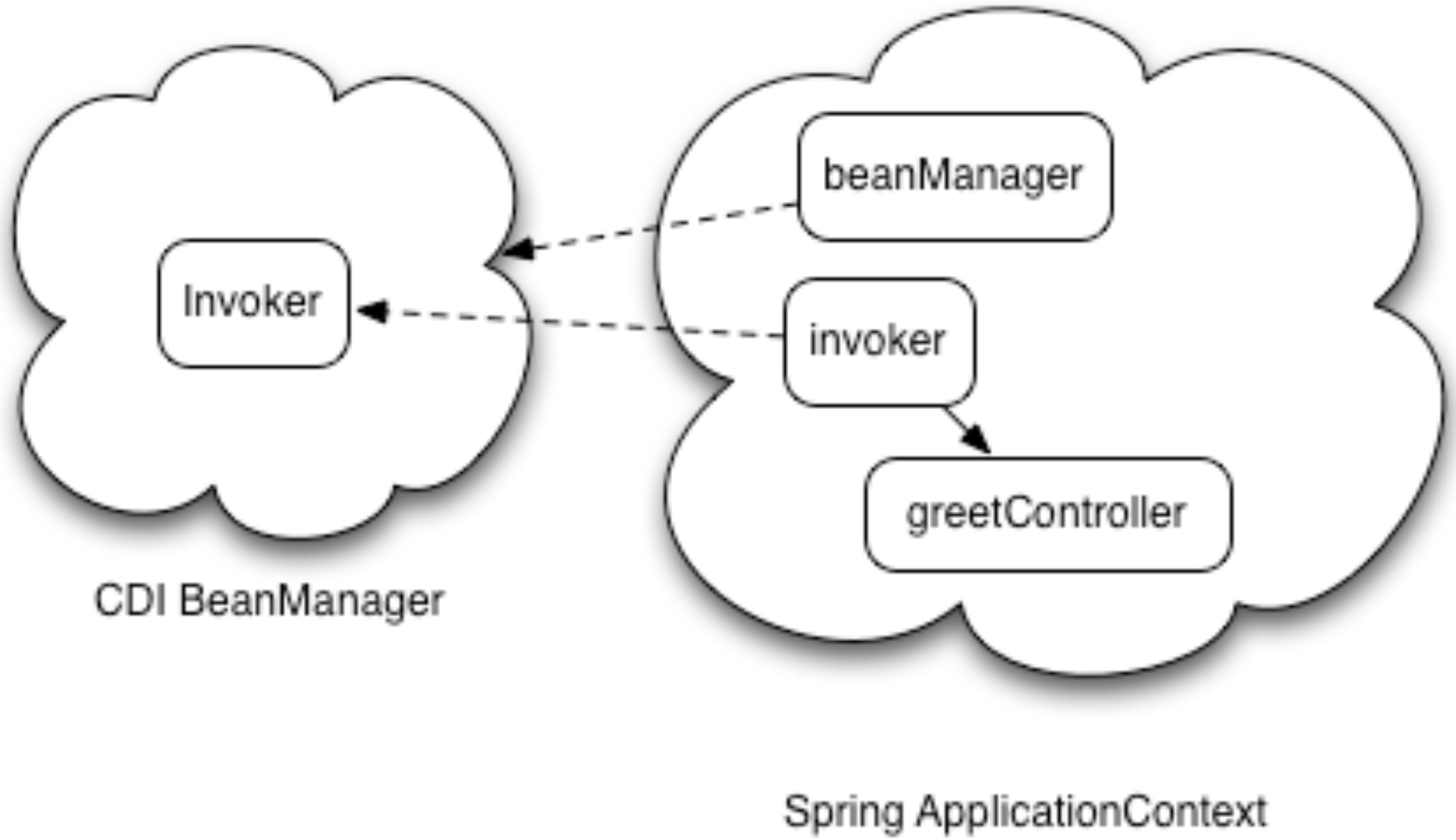
```
@Component
public class User {

 @Autowired User user;

}
```

```
xmlns:cdi="http://www.jboss.org/schema/seam/spring"
```

Importing CDI Beans into Spring

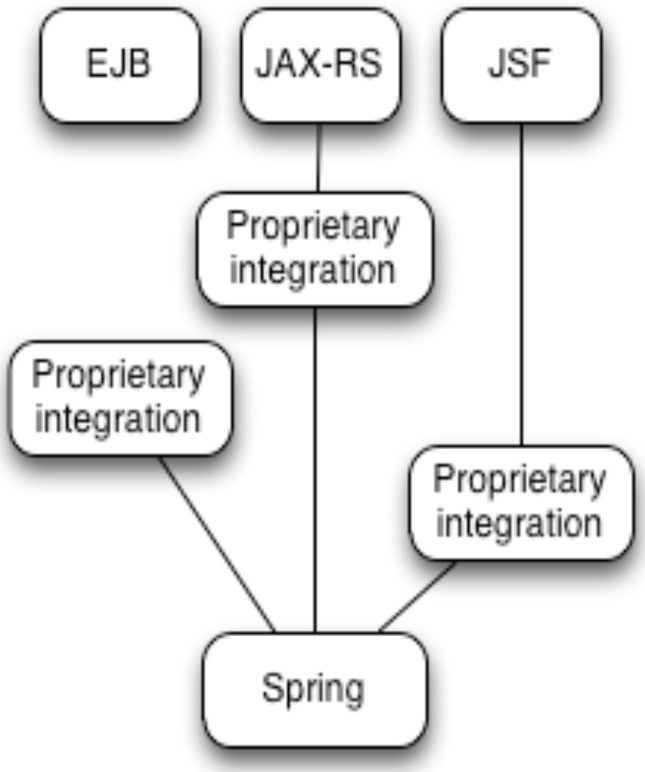


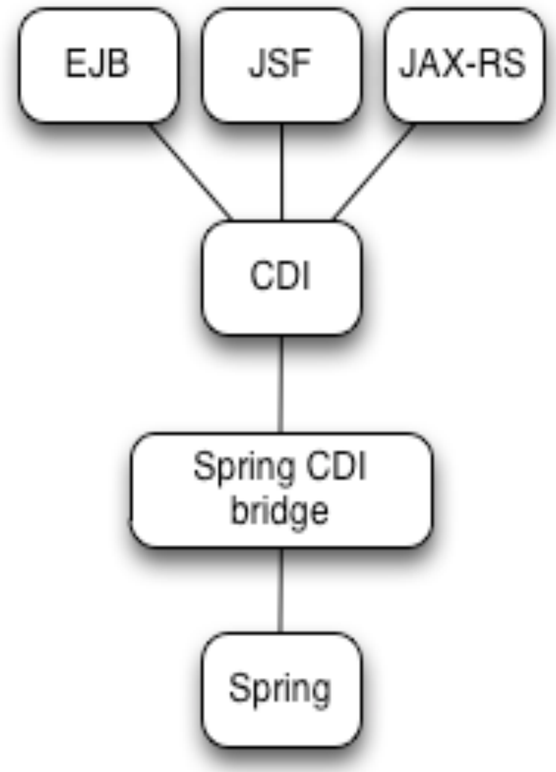
Scoping

- Spring and CDI have different approaches to bean **scoping**
  - Spring - singletons, application-scoped
  - CDI - prototype, 'default-scoped'
- The module preserves the original scope
  - `@SpringContext` beans are `@ApplicationScoped`
  - `@SpringBean` are default-scoped and fall back to the native Spring scope (AOP scope proxy required)
  - CDI beans are prototype-scoped and fall back to the native CDI scope (through their scoped proxy)

Beyond CDI

- This module can serve as basis for integrating any Java EE component with Spring
  - EJBs
  - JAX-RS
  - any component that understands CDI

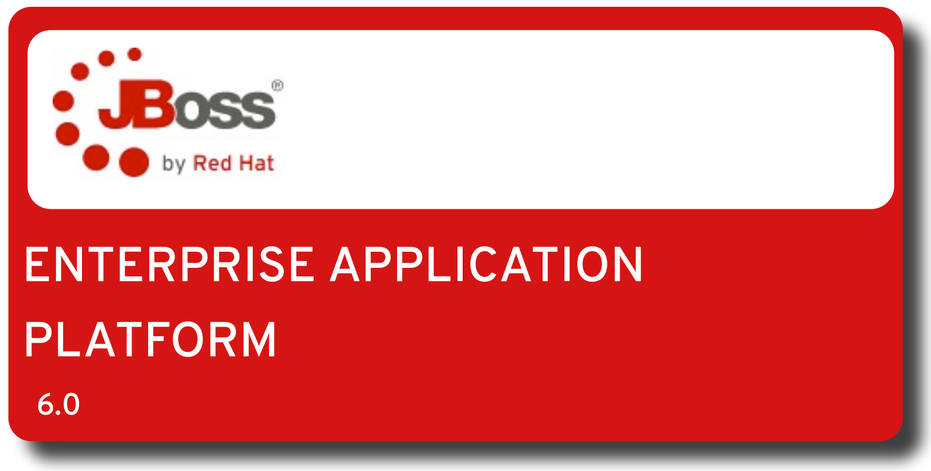




Roadmap

- Current version: 3.1.0.Final (included in Seam 3.1.0.Final)
- Upcoming versions:
  - 3.1.x - minor features, bug fixes
  - 3.2.x (March/April 2012) - additional features
    - bean autoimport
    - eventing bridge
    - bridging Spring AOP/CDI interceptors,decorators
    - Seam Persistence integration (transactions, Persistence Contexts)
- Post 3.2
  - integration into Apache DeltaSpike

JBoss AS 7.1



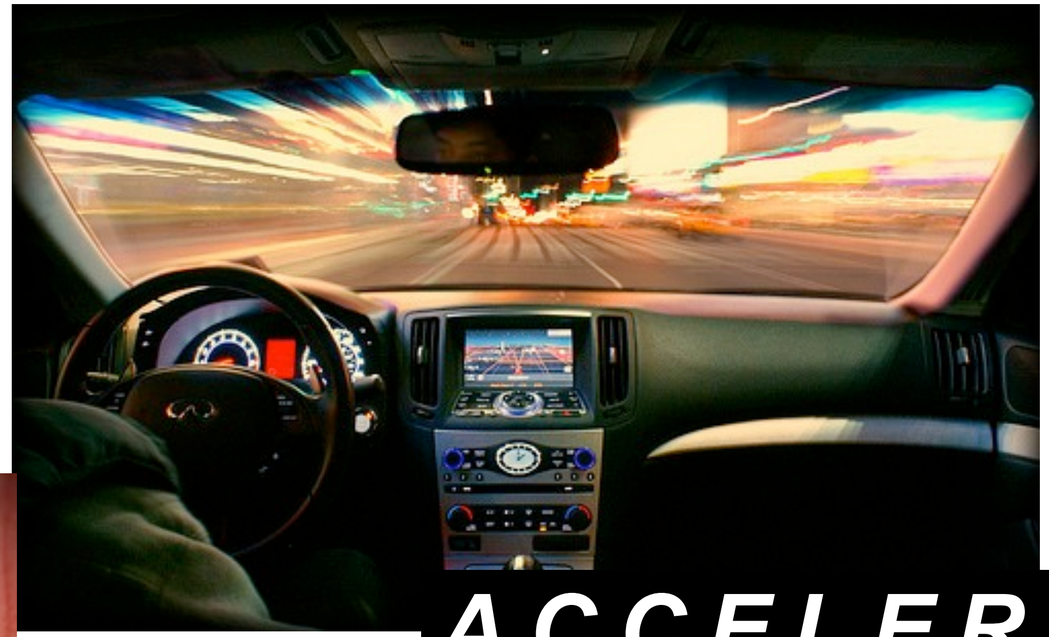
SUBSCRIPTIONS = DEVELOPER PRODUCTIVITY

NOT JUST FOR ADMINS

"Q: I'm writing a WS-Policy and..."

K I L L
DRUDGERY

Frees you to focus on the new stuff



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Thank You!

Seam 3 Spring Module - http://bit.ly/Seam3Spring

Example Code - http://bit.ly/JUDConSeamSpringCode

Apache DeltaSpike - http://bit.ly/zsWz2x

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