



# A Quick Tour of Contexts and Dependency Injection for Java EE

**Reza Rahman**

**Expert Group Member, Java EE 6**

**Resin Container Developer**

**Author, EJB 3 in Action**

**reza@caucho.com**



# Contexts and Dependency Injection for Java EE (CDI)

- **Next generation type-safe dependency management**
- **Robust contextual model**
- **Unifies web and transaction tiers (JSF and EJB 3)**
- **Conversations**
- **Interceptors/decorators**
- **Portable extensions API to integrate third-party tools and frameworks cleanly to Java EE**

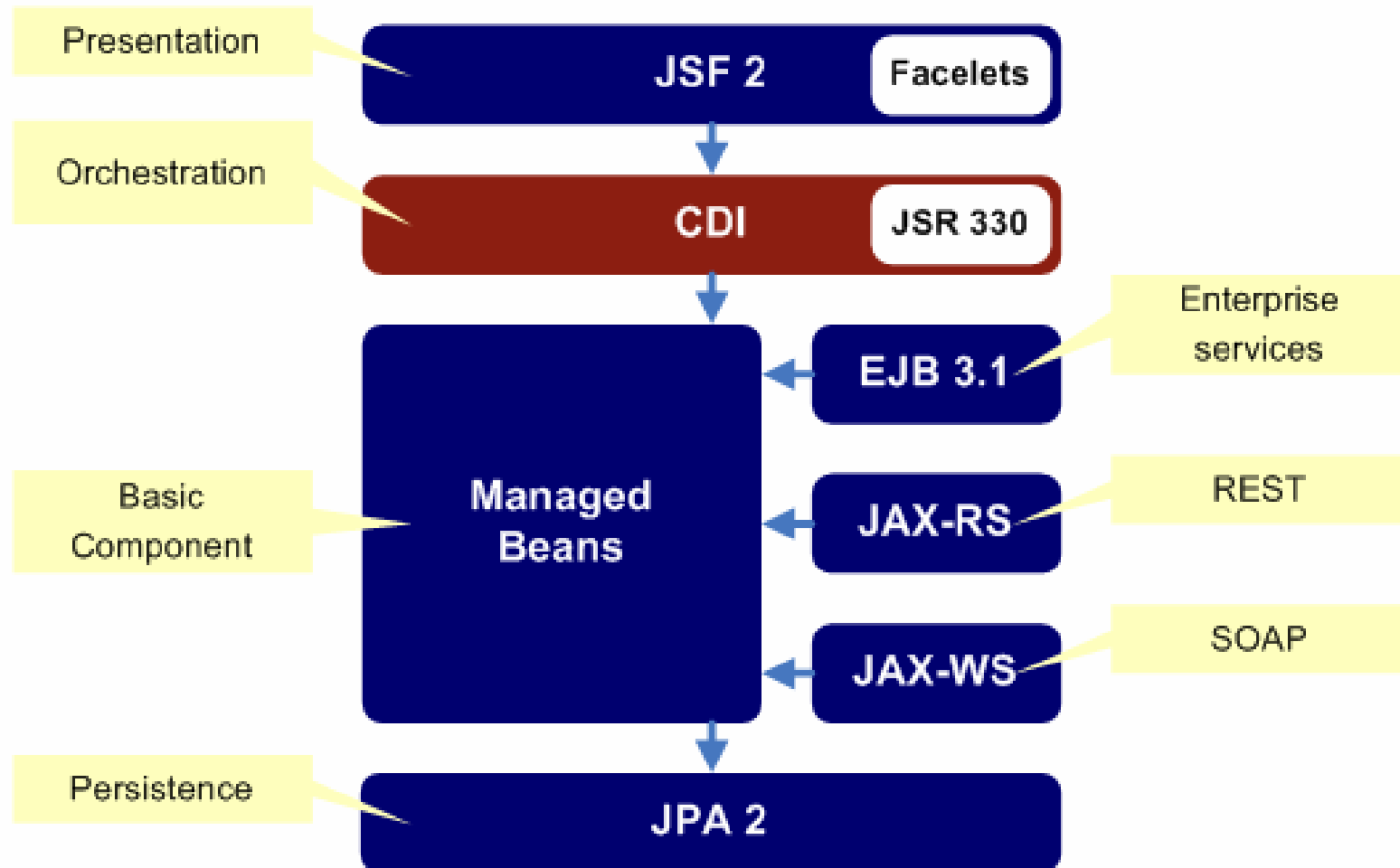


## CDI and Java EE 6

- **Orchestrates between JSF, managed beans (including EJBs), resources (data sources, queues), JPA (entity managers), third-party APIs and almost anything else**
- **Leverages web services via JAX-RS/JAX-WS and enterprise services (transactions, security, scheduling, asynchronous processing, remoting, messaging) via EJB**
- **Uses Dependency Injection for Java (JSR 330) annotations**



# CDI and Java EE 6





# CDI Features

- **Basic dependency injection**
  - @Inject, @Qualifier, @Stereotype, @Alternative, @All, @Any
- **Component naming**
  - @Named
- **Custom Object Factories**
  - @Produces, @Disposes, InjectionPoint
- **Context management**
  - @RequestScoped, @SessionScoped, @ConversationScoped, @ApplicationScoped, @Scope



# CDI Features

- **Lightweight Events**
  - Event, @Observes
- **Interceptors/Decorators**
  - @Interceptor, @InterceptorBinding, @AroundInvoke, InvocationContext, @Decorator, @Delegate
- **Portable extensions SPI**



# Implementations

## ● Weld/Seam 3

- Reference implementation from JBoss included in GlassFish and JBoss AS
- Forms basis for Seam 3
- Extensive set of portable extensions for i18n/l10n, security, Spring, Drools, jBPM, JBoss ESB, GWT, PDF, Excel, etc

## ● CanDI

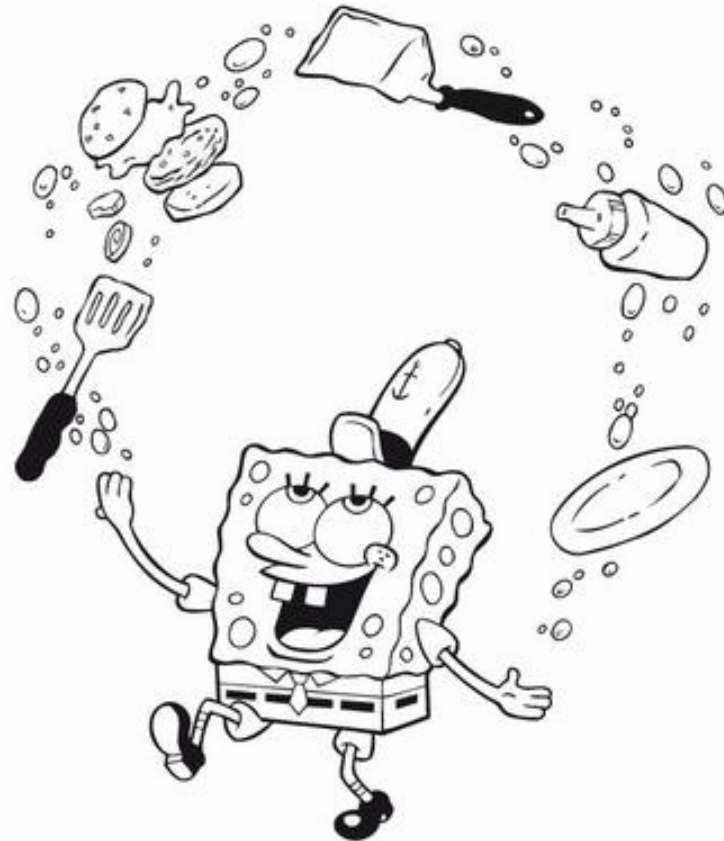
- Caucho implementation included in Resin
- Supports all enterprise service annotations outside EJB
- Portable extensions for iBATIS, Struts 2, Wicket, Quartz, JMS, JDBC

## ● OpenWebBeans

- Apache implementation included in Geronimo
- Integrates with Apache OpenEJB and works on Tomcat
- Portable extensions for major Apache projects



# The Demo!





## Portable Extensions Example (iBATIS)

@Dao

```
public class DefaultBidDao implements BidDao {
    @Inject @SqlMapConfiguration(
        location="sql-map-config.xml")
    private SqlMapClient sqlMap;

    public void addBid(Bid bid) {
        try {
            sqlMap.insert ("insertBid", bid);
        } catch (SQLException e) {
            throw new RuntimeException(
                "Data access error" e);
        }
    }
    ...
}
```



## Portable Extensions Example (Quartz)

```
public class StatementGenerator {  
    @CronSchedule(expression="0 0 0 L * ?")  
    public void generateMonthlyStatements() {  
        ...  
    }  
}
```

```
public class DirectoryScanner {  
    @SimpleSchedule(interval=10)  
    public void scanDirectory() {  
        ...  
    }  
}
```



## Summary

- **Next generation dependency injection and context management**
- **Unifies web, transaction and persistence tiers (JSF, EJB 3 and JPA)**
- **Implementations from JBoss (Weld), Caucho (CanDI) and Apache (OpenWebBeans)**
- **Powerful extension points for integrating third party APIs like iBATIS, Struts 2, Wicket, Quartz, iText, GWT, Drools, jBPM and Spring**
- **Forms basis for Seam 3**



## References

- **JSR 299: Contexts and Dependency Injection for Java EE**, <http://jcp.org/en/jsr/detail?id=299>
- **Weld, the JBoss reference implementation for JSR 299**, <http://seamframework.org/Weld>
- **Weld Reference Guide**, <http://docs.jboss.org/weld/reference/1.0.0/en-US/html/>
- **CanDI, the JSR 299 implementation for Caucho Resin**, <http://caucho.com/projects/candi/>
- **OpenWebBeans, Apache implementation of JSR 299**, <http://incubator.apache.org/openwebbeans/>



## Code Example Download

- [http://blog.caucho.com/download/candi\\_demo\\_tssjs2010.zip](http://blog.caucho.com/download/candi_demo_tssjs2010.zip)